

EPROCEEDINGS BOOK



SICONSEM

2023

*5TH SINTOK INTERNATIONAL
CONFERENCE ON SOCIAL
SCIENCE AND MANAGEMENT*

**17TH - 18TH
OCTOBER
2023**

VIRTUAL/ONLINE MODE

Organised by



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Universiti Utara Malaysia



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MESSAGE FROM VICE-CHANCELLOR

Assalamualaikum Warahmatullahi Wabarakatuh

In the name of Allah, the most gracious and merciful, Universiti Utara Malaysia (UUM) is proud to host the 5th Sintok International Conference on Social Science and Management (SICONSEM) 2023, organised by UUM Press.

Since 2018, SICONSEM has been well-attended and hugely successful. This conference serves as a unique platform for us to come together, irrespective of our backgrounds and affiliations, to engage in dialogue, share insights, and collaborate on the critical issues facing our world today that mark the convergence of minds, ideas, and perspectives in the fields of social science and management. As we navigate the complexities of the 21st century, it becomes increasingly evident that the intersection of social science and management is at the heart of addressing the most pressing challenges of our time.

As we delve into these discussions, let us remember that knowledge knows no borders and solutions to complex problems often emerge at the crossroads of different disciplines. In the spirit of interdisciplinary collaboration, I encourage each of you to actively participate, challenge existing paradigms, and seek new perspectives.

SICONSEM 2023 will bring presenters to share their knowledge with participants, as well as provide a venue for researchers to present their research with publication opportunities, all while sharing knowledge in all areas of social science and management.

I must also extend our thanks to the organising committee, whose tireless efforts have made this event possible. Their commitment to excellence has ensured that this conference is poised to be a resounding success.

Throughout our time together, I implore you all to engage in thoughtful, respectful, and constructive conversations. Let us embrace the diversity of thought, for it is within this diversity that we will find the seeds of innovation and progress.

PROFESSOR DR. FOAD SAKDAN
Vice-Chancellor

MESSAGE FROM

DEPUTY VICE-CHANCELLOR

Assalamualaikum Warahmatullahi Wabarakatuh

It is with great pleasure and anticipation that we extend our warmest welcome to the Sintok International Conference on Social Science and Management (SICONSEM) 2023. This conference marks a significant milestone in our ongoing commitment to advancing knowledge and promoting excellence in the fields of social science and management.

SICONSEM has always been a platform where passionate individuals from diverse backgrounds come together to explore the ever-evolving landscape of social science and management. This year, as we address the theme of change and resilience towards sustainability, we recognise the significance of adaptability and innovation in our quest for a sustainable future.

In our world today, change is constant. We face unprecedented challenges, from global pandemics to environmental crises, that call for transformative solutions. It is not enough to merely react to change; we must actively embrace it, harnessing its potential to drive progress and create a more sustainable world.

Throughout this conference, you will have the opportunity to engage with renowned scholars, researchers, and experts who are at the forefront of change in their respective fields. Moreover, the diverse perspectives and experiences of our international participants will undoubtedly enrich the discourse and inspire new ideas and solutions.

We are not only here to discuss challenges but also to explore the myriad of opportunities that change brings. Together, we can identify innovative approaches and sustainable practices that will lead us towards a brighter and more resilient future.

I would like to extend my heartfelt gratitude to the dedicated organising committee at UUM Press, who have worked tirelessly to make SICONSEM 2023 possible. Your commitment to the success of this conference is truly commendable.

As we embark on this intellectual journey together, let us remember that our collective efforts have the power to shape a better future. I encourage you all to actively participate, network, and collaborate during this conference. Let us leave SICONSEM 2023 with a renewed sense of purpose and a commitment to driving positive change in our respective fields.

Thank you for being part of SICONSEM 2023. May this conference be a source of inspiration, knowledge, and transformative ideas that propel us towards a future of sustainability and resilience.

PROFESSOR DR. RUSSAYANI ISMAIL
Deputy Vice-Chancellor

MESSAGE FROM THE CONFERENCE DIRECTOR

Assalamualaikum Warahmatullahi Wabarakatuh.

Distinguished participants, esteemed scholars, dedicated researchers, and aspiring students,

It is my privilege, on behalf of the SICONSEM 2023 organising committee, to welcome you to the conference. The Sintok International Conference on Social Science and Management (SICONSEM 2023) is the fifth conference in the series. Through our virtual gathering, we foster a unique environment where the exchange of ideas flows seamlessly, nurturing innovation and understanding.

As we embark on this intellectual journey, it is worth highlighting the profound significance of this conference as a nexus for current issues, challenges, and potentials related to social science. With fourteen tracks converging under the umbrella of this conference, we encompass a comprehensive range of topics that allow for a multidimensional exploration of the endemic's impact. From social dynamics to economic paradigms, education models to management strategies, we traverse a diverse terrain that reflects the intricate tapestry of our interconnected world.

One of the most exciting facets of SICONSEM 2023 lies in the promise it holds for publication. Selected articles, representing the epitome of scholarly rigour and insight, will undergo a meticulous process of evaluation and improvement. These exceptional contributions will find their rightful place in the esteemed journals published by Universiti Utara Malaysia (UUM Press), ensuring their reach to a broader audience and enhancing their impact on our evolving understanding.

As we convene virtually, let us remember that the essence of SICONSEM 2023 goes beyond the digital realm. It is a gathering of minds, aspirations, and shared visions for a better future. Engage fully in the sessions, challenge existing paradigms, and forge new connections that could shape the course of your academic journey.

I extend my deepest appreciation to all the participants, presenters, and organisers who have dedicated their time, effort, and expertise to make SICONSEM 2023 a reality. Together, let us chart a course towards a more enlightened and sustainable future.

Thank you for joining us on this exciting intellectual voyage.

ROSMA ISHAK
Conference Director

SICONSEM THEMES

THEME:

EMBRACING CHANGE AND DEVELOPING RESILIENCE TOWARDS SUSTAINABILITY

SUBTHEMES:

- Innovating assessments.
- Digital transformation within social science and management.
- Embracing change and developing resilience in a new world.
- Legal Response in an era of change.
- Capitalizing on management best practices toward sustainable business in a global economy.
- Economic reforms: Opportunities and challenges.
- Sustainability and business growth.
- Marketing and management perspectives in tourism and hospitality.
- Language and management.
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A STUDY OF THE RELATIONSHIP BETWEEN LEARNERS' SELF-REGULATED LEARNING STRATEGIES AND MOTIVATIONAL BELIEFS

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ABSTRACT

Self-regulated learning involves the development of cognitive awareness. By applying this learning theory, learners can empower their focus and attention on things. In addition, motivational beliefs through multiple attributes can be used to judge the completion of certain tasks, with the likelihood of success or failure. The objectives of this research are to explore the perceptions of learners on their use of self-regulated learning strategies and their motivational beliefs and to examine the relationship between these theories among higher education students. This research is a quantitative survey that uses descriptive and correlational statistical analysis. There are three instruments used in this research. The first section contains questions and answers to the demographic profile. The second segment covers 22 topics related to motivating beliefs, and the third section covers 22 topics related to self-regulated learning processes. A purposive sample of 113 undergraduate students from a higher education institution participated in this survey. According to the findings of this study, self-regulated learning has a strong relationship with two aspects that make up motivational beliefs: self-efficacy and intrinsic value. Meanwhile, test anxiety has a low relationship with self-regulated learning. Thus, this study shows the learners' most common strategy, memorising words with repetition rather than understanding. They also have high expectations for success in class. The instructor is suggested to increase the test with supervision in class to enhance the students' understanding.

Keywords: Motivational belief, self-regulated learning, higher education.

INTRODUCTION

Background of Study

Motivational belief serves as a willpower belief and a psychologically helpful tool and inspires students to work hard to complete assignments. Additionally, it adds another level of encouragement for learners to complete their learning objectives successfully. This study suggests the motivational belief conceptualised by three characteristics: self-efficacy, intrinsic value, and test anxiety.

Self-efficacy may be defined as having confidence to complete a task, as Prior et al. (2016) and Bandura (1986) proposed. In reaction to the growing prevalence of the use of technology, McDonald and Siegall (1992) came up with the concept of “technological self-efficacy” much later. It describes the conviction that one can use technology to complete a task successfully and produce a desirable result. Learning self-efficacy is important for students to develop because it affects their learning progress and rate. For instance, a student with strong self-efficacy may go above and beyond to achieve their learning objectives even when faced with hurdles. In contrast, a student with low self-efficacy may adopt a pessimistic or give-up attitude.

Intrinsic value is the level to which people have intrinsic motivation, referred to as using their natural curiosity and interest to engage in activities.

Increased degrees of physical discomfort and mental distress during an examination are symptoms of test anxiety. According to N et al. (2022), it is comprised of two parts: the cognitive (worry and negative ideas) and the affective-physiological (emotionality) parts.

Pintrich (1999) defines self-regulated learning as the tactics that learners use to govern their cognition and resource management strategies to control their learning. Recent research has demonstrated a connection between motivating beliefs and the ability to self-regulate one’s learning. Willpower beliefs may be more directly linked to students’ efforts to govern their motivation rather than their efforts to regulate their cognitive processes, according to a study conducted by Allen et al. (2023). This tendency may be explained by the fact that, in contrast to their capacity to participate in regulatory activities connected to information processing, students’ efforts to persevere in their work and their perceptions that demanding academic tasks may be energising are more directly related to motivation regulation.

This topic is relevant in the context of higher education in Malaysia as self-regulated learning can increase the student’s learning effectiveness and academic achievement by using planning and critical thinking techniques.

Statement of Problem

Post-COVID-19 demand in education stresses self-regulated learning (SRL) among students and has changed the landscape of education globally. During the pandemic, the shift from traditional classroom instruction to online learning has indirectly shaped students’ today’s behaviour to become more independent in seeking knowledge. Despite being spoon-fed by teachers or lecturers in a physical classroom, they strategised their learning and worked hard from home to get good grades through self-regulation (Daggol, 2021). This is a good vibe for students to use their cognitive skills while the teaching and learning process occurs in the real setting after the outbreak.

Nevertheless, at the same time, there are problems surrounding the motivating ideas that students have on their ability to organise the process of self-regulated learning properly. Unlike conventional face-to-face learning, online programmes need learners to display higher levels of self-regulation, self-motivation, and time commitment (Broadbent & Poon, 2015; Serwatka, 2003). This is because online programmes demand learners to demonstrate higher levels of self-regulation. In some instances, students were unsure of the benefits that would result from their efforts, and they also found it challenging to implement SRL; thus, even though they possessed the necessary information, they did not always effortlessly employ SRL tactics (Zimmerman, 2011).

Students need to be highly motivated in the learning process to successfully navigate SRL (Nen et al., 2023) since motivational beliefs are one of the determinants of effective SRL. This makes it extremely difficult for students to obtain good academic achievement while navigating SRL. Nen et al. (2023) explored how motivating attitudes impact students’ ability to self-regulate their learning within the setting of distant learning during the epidemic. The finding demonstrates that there is a correlation that is both extremely favourable and

statistically significant between motivating beliefs and self-regulated learning. The research recognises the recent success of collaborative learning as an intervention in enhancing the educational opportunities available to pupils.

Much research has been done on the challenges of self-regulated learning strategies during online learning (Reed, 2020). In addition, the motivational constructs involved by Jourabi et al. (2021), Karlen (2021), Lim and Yeo (2021), Bakhtiar and Allyson (2022), but how do learners perceive their self-regulated learning strategies and motivational beliefs?

Objective of the Study and Research Questions

This study aims to investigate the learners' perceptions of their usage of self-regulated learning techniques and their ideas of what motivates them to learn. In particular, the purpose of this research is to provide answers to the following questions:

- How do learners perceive their self-regulated learning strategies?
- How do learners perceive their motivational beliefs?
- Is there a relationship between learners' self-regulated learning strategies and their self-regulated learning strategies?

LITERATURE REVIEW

Motivational Beliefs (self-efficacy, intrinsic value, and test anxiety)

In this part, we explored characteristics of learners' motivating beliefs, such as test anxiety, self-efficacy, and intrinsic worth. According to what was said in Pintrich and Roeser's (1994) paper, self-efficacy, control beliefs, and anxiety are all examples of motivational beliefs that originate and maintain conduct toward a specific academic objective.

Yongmin Li and Shakirat Abibola Adesola published their findings from a study they carried out in 2018, which showed that utilising cognitive methods is connected to the dynamics of self-regulation, self-efficacy, test anxiety, and motivation. It also showed that those who rated their levels of self-regulation as high were more likely to use cognitive methods to accomplish their objectives. According to the study results, pupils with high self-control and discipline are more likely to accomplish their objectives successfully. They also tended to overpower their test anxiety to reach their targets. The study's findings also showed that pupils who could not self-regulate had a greater propensity for experiencing exam anxiety. According to Jacquelynne S. Eccles and Allan Wigfield (2002), persons are said to be intrinsically driven when they engage in an activity because it is something in which they are interested and in which they take pleasure. Studies have shown that those with high self-efficacy are more likely to demonstrate persistence and motivation. In one of their papers, Lee et al. (2020) found that the link between self-efficacy, task value, and self-regulation is comparable in online courses. The findings support the theory that engaging in activities promoting self-regulation might increase an individual's self-efficacy.

Self-Regulated Learning Strategies

One of the key learning approaches for lifelong learning is self-regulated learning (SLR). Due to the restricted learning time in class, university students need to change the learning practices that can help them learn independently (Bowman, 2017). The four significant SRL components are planning, learning, self-assessment, and monitoring. Metacognition, motivation, and dynamic behaviour in learning are also assumed to be involved in this process. Students participate in SRL by evaluating their existing knowledge, determining what they should learn, selecting appropriate learning methodologies, and using those abilities in real-world situations. This cyclical, active, dynamic process results in learners selecting the knowledge they wish to encounter or learn. Students learn SRL, a skill that cannot be acquired naturally but can be learnt and taught (Ling et al., 2023).

Learners actively operate learning processes, tools, and methods in a given environment in line with particular learning tasks and general learning norms to maximise learning effectiveness and efficiency. This is done to maximise the efficacy and efficiency of learning. This is known as using a learning strategy. It consists of four elements and is a dynamic operating system with multiple levels. Organising, concluding, and recalling are examples of cognitive strategies. Planning, monitoring, and execution techniques are examples of metacognitive tactics. Motivation, interest, and attitude in the classroom are all influenced by an emotional approach. Examples of resource management tactics include time management, control of the learning environment, and obtaining assistance as needed (Zhao et al., 2005).

For effective SRL, one must master particular learning processes. How students choose to learn substantially impacts the level of academic success they experience (Zheng et al., 2020). Learning techniques are positively connected with SRL, according to a study. To encourage effective learning and achieve educational and teaching goals in universities, learning methods play a significant theoretical and practical role in integrating knowledge and activating experience (Yang, 2006).

Past Studies on Motivational Beliefs

Numerous research papers have been conducted to explore self-regulated learning, particularly on topics such as motivational belief. The term "motivation" refers to the factors that encourage an individual or a student to participate in an activity or work towards accomplishing a goal. In the context of an educational institution, it refers to the motivation behind a student's continued effort toward accomplishing a goal. According to Huang et al.'s research from 2020, it is also connected to a person's belief in what they are thinking of. A person who is intrinsically driven will almost always have a higher level of performance than those who are not. This assertion has been supported by many studies, one of which is currently being conducted by Lilian (2022). In it, she demonstrates a positive and significant relationship between them and that this relationship signifies the significant role of self-motivation in promoting digital literacy and preparing students to be a part of the digital future.

The concept of motivated belief has been the subject of many research papers in the past. The study was conducted by Lilian (2022) to investigate the connection between motivating belief systems and digital literacy in the context of digital learning among university students. This study intends to contribute to supporting students and academics in using the appropriate motivational tactics to raise students' digital literacy. One of its goals is to do so by contributing to the field of student assistance.

In order to accomplish the purpose of the research, three hypotheses were developed. Empirical research was conducted on 583 respondents utilising structural equation modeling-partial least-squares analysis. The study's results support the hypothesis that there is a positive and substantial association between motivational belief systems and digital literacy competency. This suggests that self-motivation is vital in fostering digital literacy and preparing students to participate in the digital future.

The investigation was carried out by Shonn Cheng, Kui Xie, and Jessica Collier (2023). This study evaluated the connection between academic performance in an online science course and academic delay, motivational beliefs, and academic accomplishment. The course was taken entirely online. In total, there were 168 first-year college students included in the sample. Through the utilisation of learning analytics and multilevel modelling, this research concluded that academic delay comprises habitual and temporary components.

Regarding academic performance, the chronic delay was much more detrimental than the temporary delay after allowing for the influence of motivational beliefs. It was discovered that motivational attitudes mediate the connection between academic delay and achievement. The emotional cost was a factor in the negative impact of a chronic delay on academic performance. Academic self-efficacy was a factor in the negative impact of a brief delay

on academic performance. These findings prove that college students are not necessarily disadvantaged by academic lag when participating in online learning settings. For future intervention purposes, it may be misleading to focus on academic delay without considering the individuals displaying such conduct.

Past Studies on Self-Regulated Learning Strategies

There have been many past studies on the SLR. The study by Anas (2022) is Self-regulated Learning in Online Classes: A comparative study between Malaysian and Indonesian students that the SRL can improve students' educational experience and a strategy and behaviour that allows students to change their cognitive abilities to specific academic task skills. This contains behaviours and tactics that have allowed students to translate their cognitive capacities into task-specific academic skills. These will provide a high degree of marketability among students, a positive attitude, high academic motivation, and strong self-learning control over them.

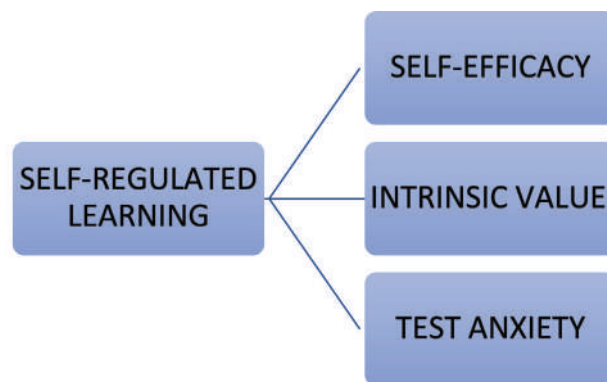
Using an online questionnaire, this data was gathered from 103 undergraduates at University A in Malaysia and 119 college students at University B in Indonesia. Overall, this study shows that SLR can be continued even though it is implemented during this new pandemic for the continuation of learning. However, this implementation can assist students in increasing their productivity. It can also assist instructors and lecturers in choosing the most suitable way to boost student performance in online classrooms during and after the COVID-19 epidemic.

Conceptual Framework

The conceptual foundation of the research is presented in Figure 1. The purpose of this research is to investigate the connections that may be made between motivational beliefs and self-regulated learning mechanisms. Online learners are put in situations where they have to fend for themselves to maximise learning (Rahmat, 2022). Their learning is not passive as they struggle to make sense of their learning independently, to become self-regulated learners. According to Pintrich and De Groot (1990), learners' motivational beliefs comprise (i) self-efficacy, (ii) intrinsic value, and (iii) test anxiety. In addition to that, Pintrich and De Groot (1990) also suggested that self-regulated strategies are (i) cognitive strategy use and (ii) self-regulation.

Figure 1

Conceptual Framework of the Study: Is there a relationship between self-regulated learners and motivational beliefs?



METHODOLOGY

This quantitative study investigates the elements that motivate students to learn at the undergraduate level. The survey received responses from 113 people who were chosen at random from the pool of participants. The tool utilised was a 5-point Likert scale survey, and its origins can be traced back to Pintrich and De Groot (1990). The results of this survey can be seen in Table 1 below. The survey is broken up into three parts. The first section

contains questions and answers about the demographic profile. The second segment covers 22 topics related to motivational beliefs, and the third section covers 22 topics related to self-regulated learning techniques.

Table 1

Distribution of Items in the Survey

PART	STRATEGY	SCALE	NO OF ITEMS	TOTAL ITEMS	
ONE TWO	MOTIVATIONAL BELIEFS	A	SELF-EFFICACY	9	22
		B	INTRINSIC VALUE	9	
		C	TEST ANXIETY	4	
THREE	SELF-REGULATED LEARNING STRATEGIES	D	COGNITIVE STRATEGY USE	13	22
		E	SELF-REGULATION	9	
TOTAL NO OF ITEMS				44	

Table 2

Reliability of Survey

Reliability Statistics	
Cronbach's Alpha	N of Items
.943	44

The survey's dependability is outlined in Table 2. Since the analysis yielded a Cronbach alpha value of .943, it can be deduced that the instrument selected and employed was highly reliable. In order to give data and provide answers to the research questions posed by this study, further SPSS analysis is performed.

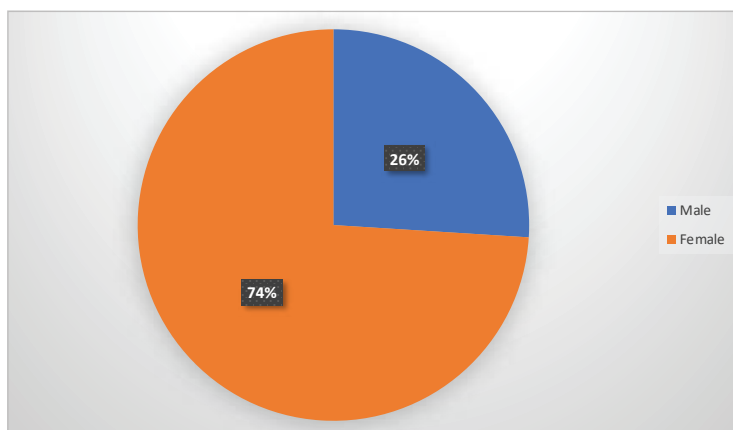
FINDINGS

Findings for Demographic Profile

Q1. Gender

Figure 2

Percentage of Gender

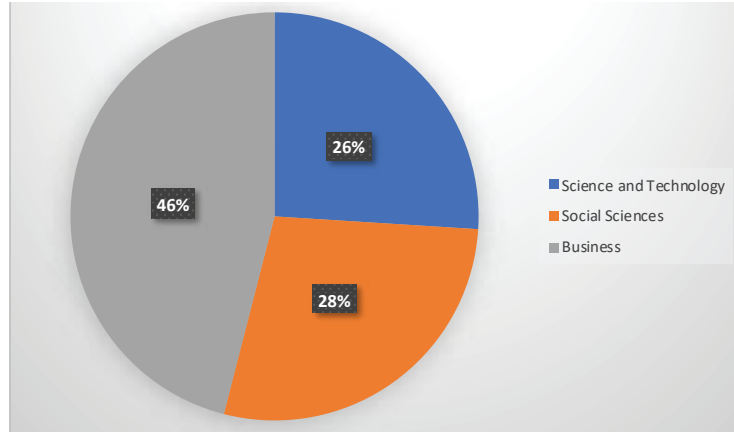


This result shows the gender percentage of participants. 74% of participants are female and 26% are male.

Q2. Discipline

Figure 3

Percentage of Discipline

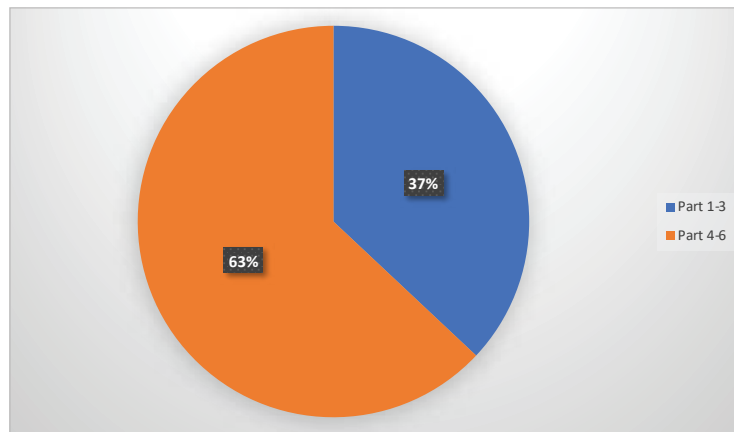


This result shows the discipline of participants. 46% of participants are from business disciplines, 28% are from social sciences, and 26% are from science and technology. The majority of the participants are from the non-science stream.

Q2. Part

Figure 4

Percentage for Semester (Part)



This result shows the semester percentage of participants. 37% of participants are from Part 1-3, while the rest (63%) are from Part 4-6.

Findings for Self-Regulated Learning Strategies

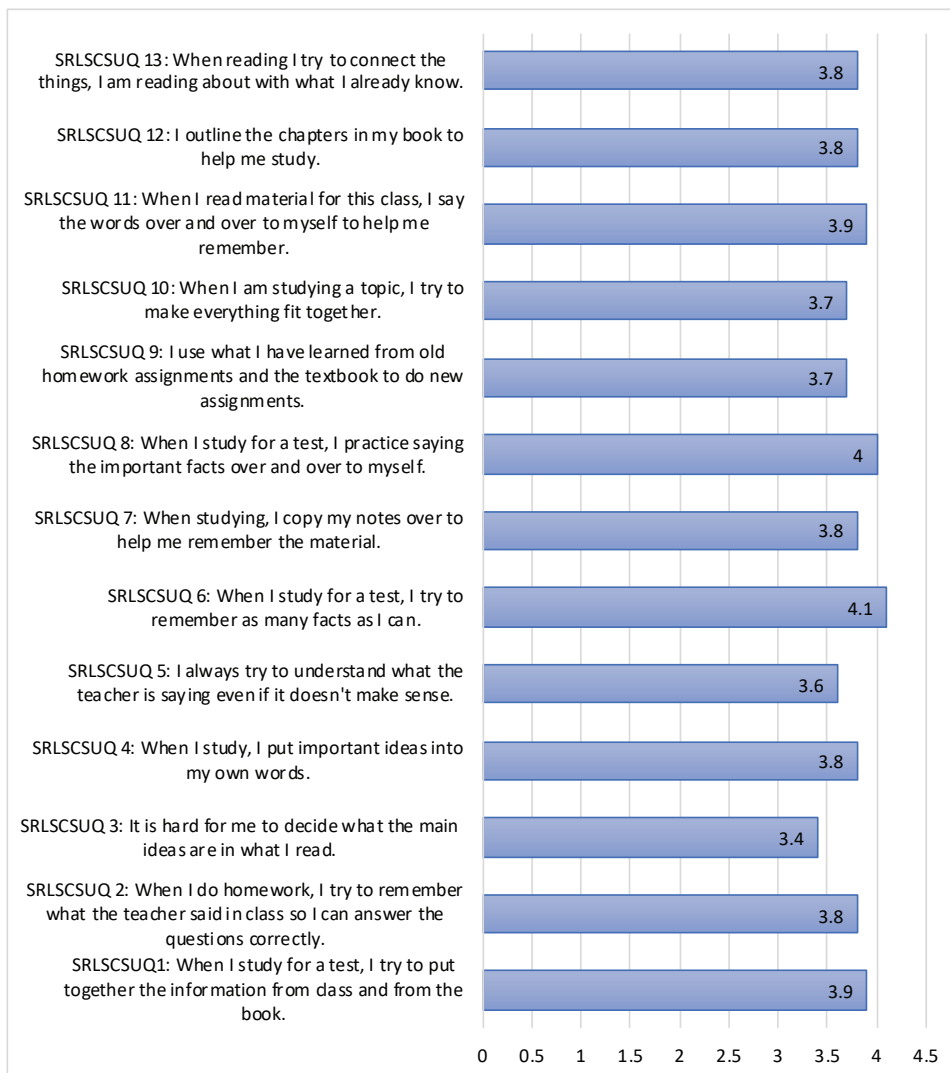
This section presents data to answer research question 1- How do learners perceive their self-regulated learning strategies?

Part Three- Self-Regulated Learning Strategies

Cognitive Strategy Use (13 Items)

Figure 5

Mean for Cognitive Strategy



The findings of the cognitive strategy utilised to identify learners' self-regulated technique are displayed in Figure 5. According to the standards laid forth by Yongmin Li and Shakirat Abibola Adesola (2018), the findings showed that a person's sense of self-efficacy had a substantial correlation with their usage of cognitive methods and their level of self-regulation. It also showed that those who rated their levels of self-regulation as high were more likely to use cognitive methods to accomplish their objectives.

The cognitive technique employed by students in higher education was evaluated using 13 different question items. Surveys based on a 5-point Likert scale were used to measure the results. The outcomes that demonstrated a more excellent value were: SRLSCSUQ 6: When I study for a test, I try to remember as many facts as possible with a mean score of 4.1. Followed by SRLSCSUQ 8: When I study for a test, I repeatedly practice saying the

important facts to myself with a mean score of 4.0. Two items have been chosen with a mean score of 3.9, which is SRLSCSUQ1: When I study for a test, I try to put together the information from class and the book and SRLSCSUQ 11: When I read material for this class, I say the words over and over to myself to help me remember.

The results that showed the most equivalent value were SRLSCSUQ 2: When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly; SRLSCSUQ 4: When I study, I put essential ideas into my own words; SRLSCSUQ 7: When studying, I copy my notes over to help me remember the material; SRLSCSUQ 12: I outline the chapters in my book to help me study; and SRLSCSUQ 13: When reading I try to connect the things, I am reading about with what I already know (values at score mean 3.8). Thus, in SRLSCSUQ 9, I use what I have learned from old homework assignments and the textbook to do new assignments, and in SRLSCSUQ 10, When I am studying a topic, I try to make everything fit together with a score mean of 3.7. These are followed by a mean score of 3.6, the second-lowest score, SRLSCSUQ 5: I always try to understand what the teacher is saying even if it does not make sense. The lowest mean score is 3.4, which is the statement SRLSCSUQ 3: It is hard for me to decide what the main ideas are in what I read.

Self-Regulation (9 Items)

Figure 6

Mean for Self-Regulation

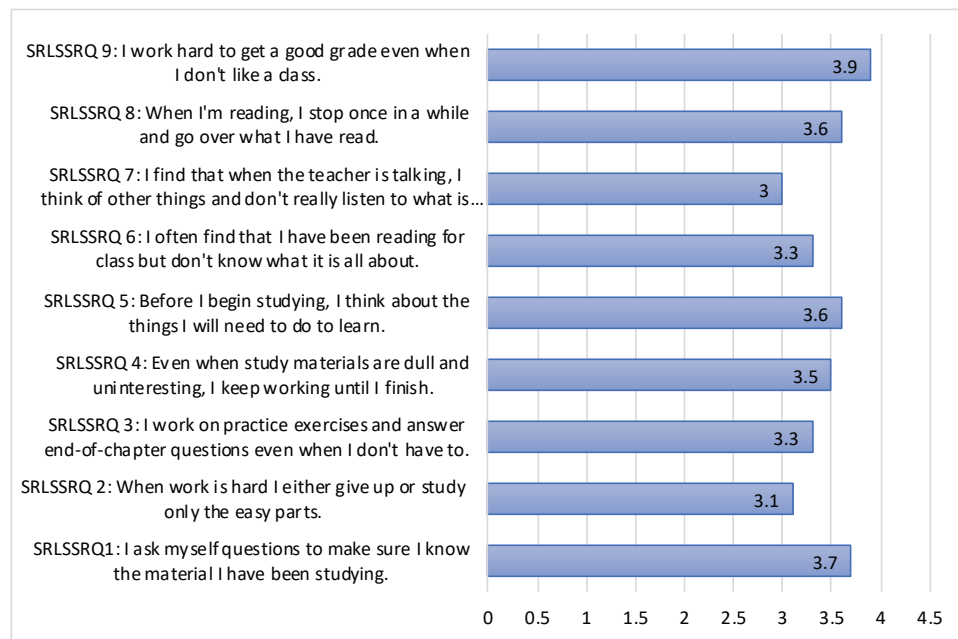


Figure 6 shows the result for self-regulated learning, which consists of 9 items. The highest score is 3.9 for item SRLSSRQ 9: "I work hard to get a good grade even when I do not like a class". This means that most students study hard despite not favouring the subject. It is followed by the item SRLSSRQ1 with a 3.7 mean score, "I ask myself questions to make sure I know the material I have been studying". This proved that most students were aware of the material used in the class and used the suitable material. The lowest score is mean 3 for item SRLSSRQ 7: "I find that when the teacher is talking, I think of other things and don't really listen to what is being said". This explains that students are focused in the class while the teacher is teaching.

Findings for Motivational Beliefs

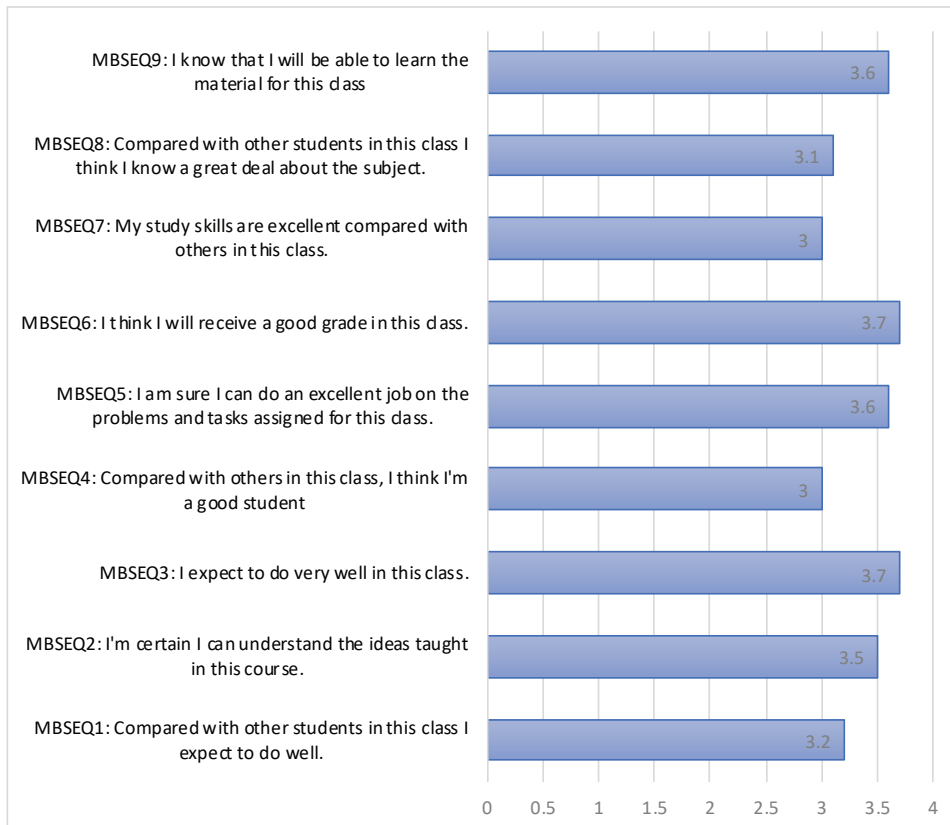
This section presents data to answer research question 2- How do learners perceive their motivational beliefs?

Part 2 - Motivational Beliefs (22 Items)

Self-Efficacy (9 Items)

Figure 7

Mean for Self-Efficacy



In this part, the data necessary to address research question 1 are presented: How do Motivational beliefs influence learners' motivation (22 items) to Halal Management? According to Pintrich and De Groot (1990), motivating beliefs are affected by a variety of factors: (a) self-efficacy (9 items), (b) intrinsic values (9 items), and (c) test anxiety (4 items). The self-efficacy for motivating beliefs scale comprised nine questions constructed to measure a student's evaluation of their competence and skill in executing the task and the student's expectation for success in a particular activity. The highest mean is the item of Motivation Beliefs Self-Efficacy Question (MBSEQ) 3 and 6 (M=3.7). Thus, the second highest on MBSEQ are statements 5 and 9 (M= 3.6), followed by MBSEQ 2 (M=3.5). MBSEQ 1 (M=3.2), MBSEQ 8 (M=3.1). When compared to the findings of the other sections of the motivational beliefs scale, the self-efficacy section has the lowest mean score, which is 3 for MBSEQ 4 and 8.

Intrinsic Value (9 Items)

Figure 8

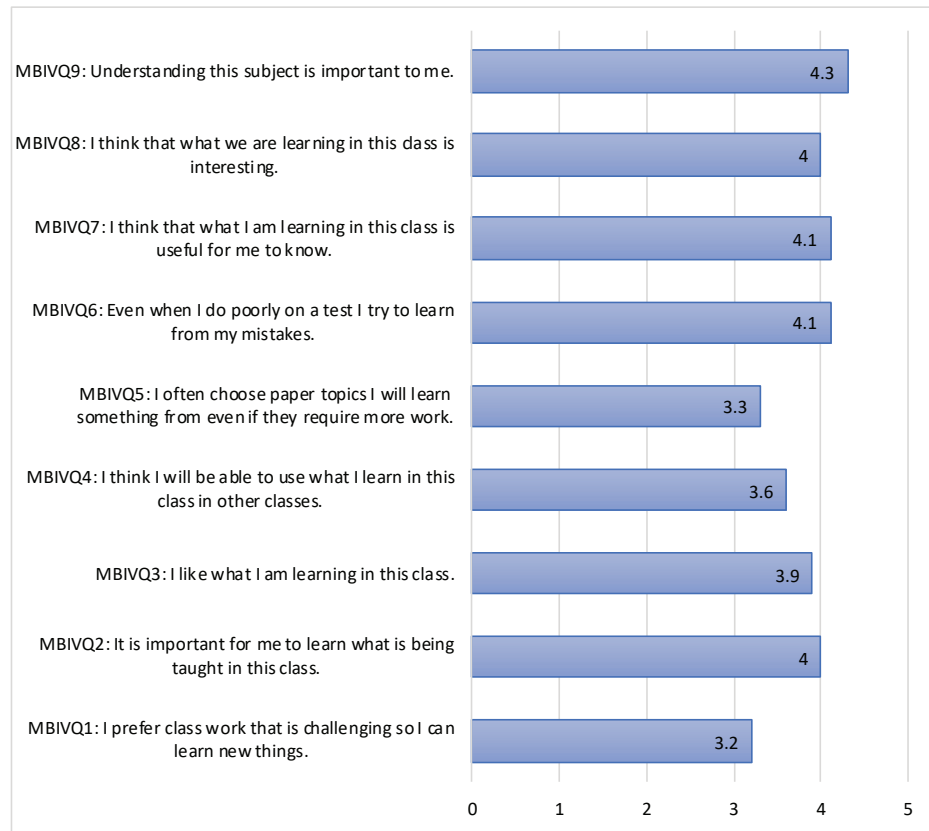
Mean for Intrinsic Value

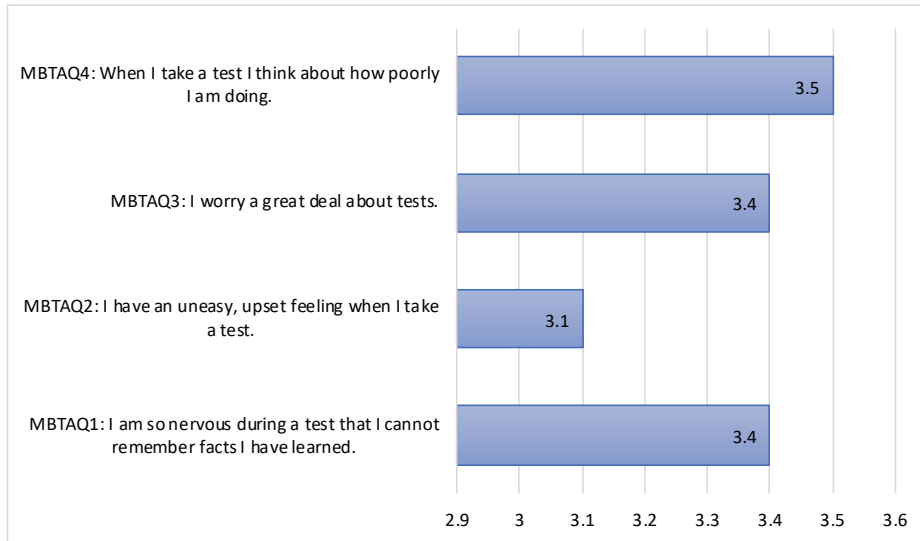
Figure 8 presents the descriptive statistics for each of the constructs in the intrinsic value. The scale for intrinsic value uses a Likert-type response frequency format, ranging from 1 (never) to 5 (always). A higher score means the participants indicate higher motivational beliefs in their self-regulated learning strategy through intrinsic value. All mean scores range from 3.2 to 4.3. All constructs' mean scores were above the midpoint, suggesting the students had generally responded positively to the measured constructs. The highest mean score of 4.3 is from construct MBIVQ9 with the statement, "Understanding this subject is important to me". Meanwhile, the lowest mean score with a 3.2 score is MBIVQ1 with the statement, "I prefer class work that is challenging so I can learn new things".

Based on the mean scores, it was determined that the learners' intrinsic value has a significant effect on their self-regulated learning strategy. Participants prefer understanding the core aspect of a subject, which is associated with comprehension. The awareness of the topic, including its fundamentals, overarching ideas, fundamental concepts, and fundamental theories. It seems to be the motivating part of learning and facilitates learners' future application of knowledge. Participants are engaged with the subject because of internal self-satisfaction. Their interest in learning and understanding the subject became crucial to their learning strategy.

Test Anxiety (4 Items)

Figure 9

Mean for Test Anxiety



This section describes the mean of test anxiety perception among learners. The highest score is 3.5 for item MBTAQ4: “When I take a test, I think about how poorly I am doing”. It followed MBTAQ1 and MBTAQ3: “I am so nervous during a test that I cannot remember facts I have learned” and “I worry a great deal about tests”. Both of these two items’ score is 3.4. The lowest mean score is 3.1 for MBTAQ2, “I have an uneasy, upset feeling when I take a test”. Based on the mean scores, most students have anxiety regarding cognition during the examination.

Findings for Relationship between Self-regulated Learning Strategies and Motivational Beliefs

The information needed to answer research question 3 is presented in this section. Is there a relationship between learners’ self-regulated learning strategies and their self-regulated learning strategies? Data is examined with SPSS for correlations to evaluate whether there is a significant link in the mean scores between self-regulated techniques and self-efficacy, intrinsic worth, and test anxiety. The following tables 3, 4, and 5 each give the results.

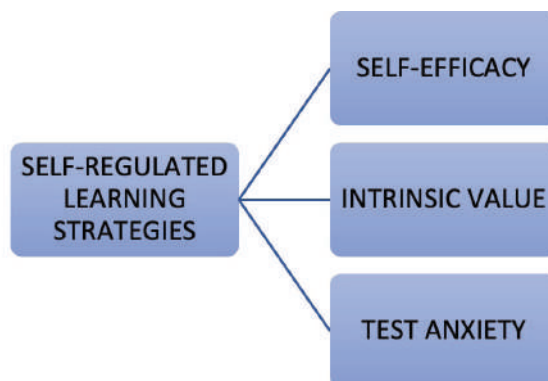


Table 3

Correlation between Self-Regulated Learning Strategies and Self-Efficacy

		TOTALSELFR EGULATED	TOTALSELFEF FICACY
TOTALSELFR EGULATED	Pearson Correlation	1	.545**
	Sig. (2-tailed)		.000
	N	113	113
TOTALSELFEF FICACY	Pearson Correlation	.545**	1
	Sig. (2-tailed)	.000	
	N	113	113

** . Correlation is significant at the 0.01 level (2-tailed).

The findings in Table 3 indicate a connection between self-regulated learning practices and perceptions of self-efficacy. Correlation analysis reveals a highly significant link between self-regulated learning techniques and self-efficacy ($r=.545^{**}$ and $p=.000$). This association is significant at a high level. According to Jackson (2015), the coefficient achieves statistical significance at the .05 level, and positive correlation is evaluated on a scale ranging from 0.1 to 1.0. The range of values for a positive correlation considered weak is 0.1 to 0.3, the range for a moderate positive correlation is 0.3 to 0.5, and the range for a positive correlation considered high is 0.5 to 1.0. This indicates that a substantial positive association exists between self-regulated learning processes and perceptions of self-efficacy in a similar manner.

Table 4

Correlation between Self-Regulated Learning Strategies and Intrinsic Value

		TOTALSELFR EGULATED	TOTALINTRI NSIC
TOTALSELFR EGULATED	Pearson Correlation	1	.668**
	Sig. (2-tailed)		.000
	N	113	113
TOTALINTRI NSIC	Pearson Correlation	.668**	1
	Sig. (2-tailed)	.000	
	N	113	113

** . Correlation is significant at the 0.01 level (2-tailed).

The findings in Table 4 indicate a connection between self-regulated learning methods and intrinsic value. According to the findings of a correlation analysis, there is a highly significant connection between self-regulated learning processes and intrinsic worth ($r=.668^{**}$ and $p=.000$). According to Jackson (2015), a positive correlation may be assessed on a scale ranging from 0.1 to 1.0. The coefficient reaches statistical significance at the level of .05. The range of values for a weak positive correlation is 0.1 to 0.3, the range for a moderate positive correlation is 0.3 to 0.5, and the range for a positive correlation considered high is 0.5 to 1.0. This indicates that there is a substantial positive association between methods of self-regulated learning and intrinsic value as well.

Table 5

Correlation between Self-Regulated Learning Strategies and Test Anxiety

		TOTALSELFREGULATED	TOTALTESTANXIETY
TOTALSELFREGULATED	Pearson Correlation	1	.256**
	Sig. (2-tailed)		.006
	N	113	113
TOTALTESTANXIETY	Pearson Correlation	.256**	1
	Sig. (2-tailed)	.006	
	N	113	113

** . Correlation is significant at the 0.01 level (2-tailed).

The findings presented in Table 5 indicate a connection between self-regulated learning practices and test anxiety. According to the findings of the correlation study, there is only a marginally significant connection between self-regulated learning techniques and test anxiety ($r=.256^{**}$) and ($p=.000$). According to Jackson (2015), the coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. A weak positive correlation would be between 0.1 to 0.3, a moderate positive correlation from 0.3 to 0.5, and a solid positive correlation from 0.5 to 1.0. This means that there is also a weak positive relationship between self-regulated learning strategies and test anxiety.

CONCLUSION

According to the results, firstly, it can be inferred that students preferred to retain information through repeating and memorising facts and figures over comprehending and visualising the essential ideas. Additionally, even though they dislike the subject, most students work hard in class and use the proper materials. Students gauge their own motivating beliefs by having high expectations for themselves. They anticipate doing well in their study and being a good student in the classroom. Additionally, students are motivated to focus on comprehension, which is related to comprehending the fundamentals of a subject. Understanding the topic means including its guiding principles, broad generalisations, concepts, and theories. In addition, the result shows that most students experience exam anxiety that is cognitive rather than emotional.

The second finding is that self-regulated learning techniques and self-efficacy are related. In addition, self-regulated learning techniques and self-efficacy have a significant beneficial association. Self-controlled learning techniques and intrinsic value are also related. According to a correlation study, self-regulated learning techniques and intrinsic value have a highly significant relationship. Exam anxiety and self-regulated learning practices are related, according to the outcome. By the way, self-regulated learning mechanisms and test anxiety have a weakly significant correlation, according to correlation analysis. This result supports a study by Yongmin Li and Shakirat Abibola Adesola (2018), showing that cognitive techniques are associated with self-regulation, self-efficacy, test anxiety, and motivation.

(Pedagogical) Implications and Suggestions for Future Research

This study demonstrates the pedagogical effects of the current teaching and learning methods in higher education. We can see that the learners use self-regulated learning to achieve their goals. However, most students can only use their cognitive capacities at a basic level: memory and repetition rather than understanding. They are motivated to

understand the course material and can use it. The teacher should change the teaching and learning methods or conduct assessments to ensure the student thoroughly understands the curriculum for the next higher education stage.

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EXPLORING MODULE DEVELOPMENT FOR EFFECTIVE TEACHING AND LEARNING IN ART EDUCATION: A COMPREHENSIVE REVIEW

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ABSTRACT

This study aims to provide a detailed analysis of module development in art education for effective teaching and learning. It examines the significance of module development in inspiring educators to create high-quality and creative learning materials for the present generation. The methodology involves a comprehensive literature review to gather relevant and impactful information. The findings of this study illustrate that learning theories such as constructivism, behaviourism, and social learning theory offer a solid foundation for module development in art education. Emphasis is given to the importance of employing effective assessment strategies in art education modules, including formative, summative, and self-assessment, to enhance student learning and achievement. Furthermore, the study explores how technology can be integrated into module development to improve learning outcomes. Appropriate use of technology can provide broader opportunities to engage and motivate students in the art education learning process. Within the context of the crucial role of module development, this study highlights the necessity of continuous professional development for art educators, particularly in module development. This ensures that educators remain relevant to current developments in art education and can provide practical and meaningful instruction to their students. In conclusion, this study offers comprehensive insights into the importance of module development in art education teaching and learning. The results of this research can serve as a valuable guide for educators, researchers, and other stakeholders involved in the field to enhance the quality of art education teaching and learning.

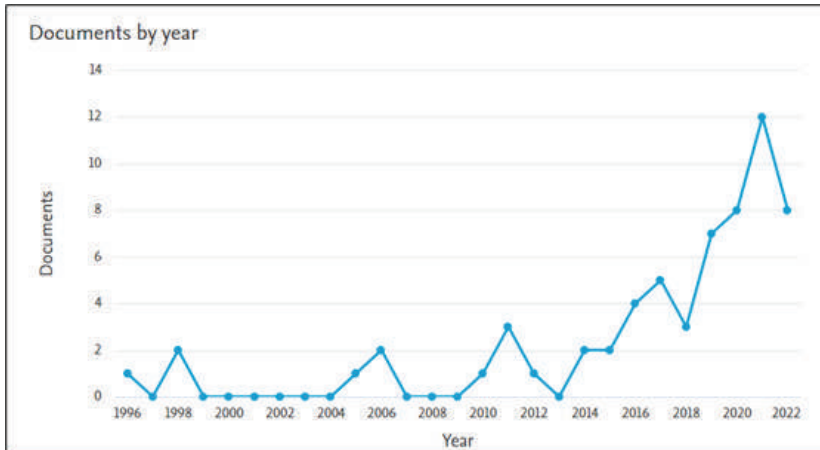
Keywords: Module development, Effective Teaching, Art Education, Technology Integration and Assessment.

INTRODUCTION

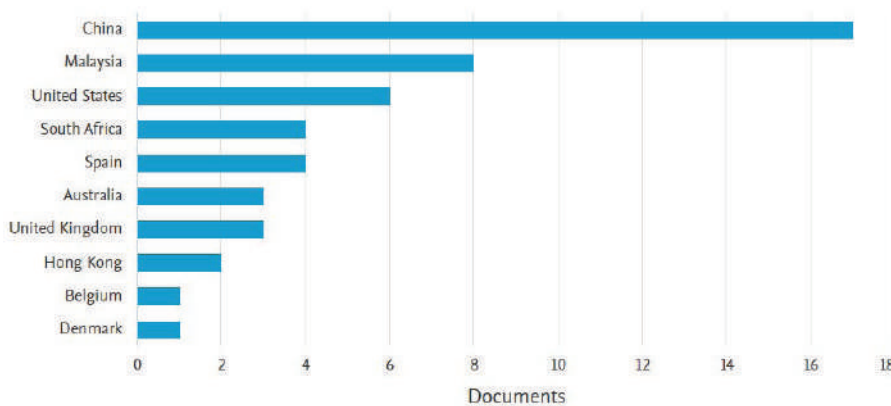
Art education is one of the important components of a comprehensive education system. It provides opportunities for students to develop their creativity, critical thinking, and problem-solving skills. Nowadays, there is increasing interest in developing teaching and learning modules in art education to improve the quality and effectiveness of art teaching. This can be seen from the increase in the study of the development of art modules in learning from 1996 to 2022 (Figure 1). By using the keywords "Module OR Modular" and "Art Education", 62 module development studies were identified from Scopus database data on June 20, 2023. China is the most active country in module development research with 17 studies, followed by Malaysia with eight studies and the United States with 6 studies. In addition, there are also studies from countries such as Africa, Spain, Denmark, France, Germany, Greece, Hungary, Ireland, Norway, Singapore, Slovakia, South Korea, Taiwan, and Turkey, with one study each (Figure 2). Most of the most extensive contributions to module development studies are from developed and developing countries. Not only that, but there are also research contributions from several countries worldwide in developing the module. This shows the importance of using modules in the learning process in the field of Art Education.

Figure 1

Trends in the Improvement of Art Education Module Development Research from 1996-2022

**Figure 2**

Art Education Module Development Research by Country



The teaching and learning module is structured to deliver educational content, guide students through the learning process, and help students understand a subject being studied (Sidek Mohd Noah & Jamaludin Ahmad, 2005). It usually includes a set of learning objectives, teaching materials, and assessment strategies designed to help students achieve specific learning outcomes (Guido, 2014). In art education, modules can be categorised in various forms, including studio-based, research-based, or history-based learning, because the content of the designed module is dependent on the intended learning outcomes.

Developing an effective art education module is a complex process requiring careful planning, collaboration, and evaluation. To ensure that the developed module successfully achieves its goals, the development process must be based on sound educational theory and designed using appropriate teaching strategies. According to Sidek Mohd Noah and Jamaludin Ahmad (2005), theory is an important element in module development because it is the backbone of the strength of a module that is built. In addition, in the development process, modules need to be carefully evaluated to ensure they are valid, reliable, and effective in promoting student learning (Russell, 1974; Sidek Mohd Noah, 1977; Jamaludin Ahmad & Sidek Mohd Noah, 2001).

A comprehensive review of this research aims to provide an overview of the development of teaching and learning modules in art education. It will explore the different types of modules used in art education and the theories that underpin its development. It will also describe the importance of setting clear learning objectives, designing teaching materials

that support those objectives, and assessing the validity and reliability of modules. This study also discusses the importance of continuous assessment and the need to make appropriate modifications in the Art Education teaching and learning module as needed. By providing a comprehensive overview of the development of teaching and learning modules in art education, it is hoped that this research can provide educators with the tools and knowledge they need to create effective modules that improve student learning outcomes.

METHODOLOGY

This comprehensive research was conducted across Scopus, Google Scholar, Eric, and various databases using keywords such as Art Education, Teaching and Learning Modules, Module Development, Learning Outcomes, Educational Theory, Assessment Strategies, Technology Integration, and Professional Development from the year 1966 to 2022 in both English and Malay languages. Relevant studies were identified and analysed based on themes, including module development, types of modules, theoretical applications, impacts and reliability, module assessment, and professional development. For full-text articles that were not accessible, attempts were made to obtain them through email correspondence with the authors.

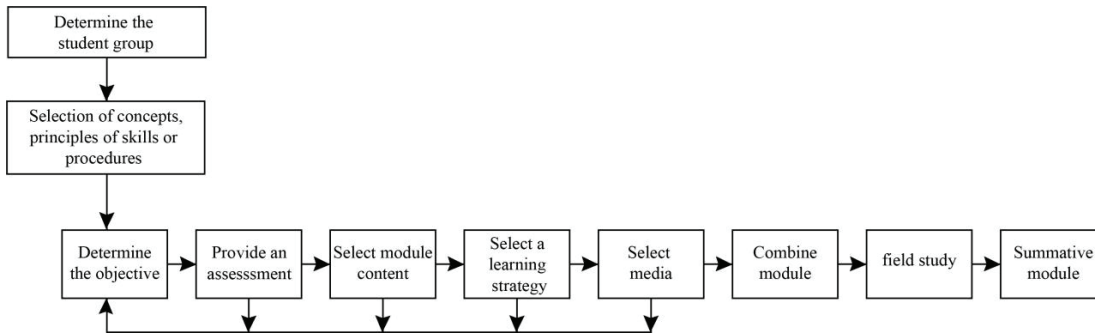
LITERATURE REVIEW

Module Development

The development of teaching and learning modules in art education is an important resource for ensuring effective teaching. The development process involves creating teaching materials aligned with learning outcomes, considering students' needs and learning styles, and incorporating best practices in module development. The process requires systematic planning and consideration of the factors that affect student learning outcomes. Several processes can be used as a guide in the development of Art Education modules. The module development process proposed by Sleeman and Rockwel (1976) (Figure 3) begins by identifying the target group or students by considering their age, intelligence, background, and socioeconomic factors. Then, the following process is to choose concepts, principles, skills, and procedures that will be included in the module. After that, the objectives to be achieved at the end of learning need to be determined. The module's creator also needs to plan assessment questions to test the level of student achievement, choose the content of the appropriate module, select learning strategies that can interest students, and select media that can help strengthen student understanding. Finally, the created modules need to be compiled and put together for validity and reliability before being tested for effectiveness through experimental tests (Sharifah Alwiah Alsagof, 1981; Sidek Mohd Noah & Jamaludin Ahmad, 2005)

Figure 3

Flowchart of the Module Development Process by Sleeman and Rockwell 1976

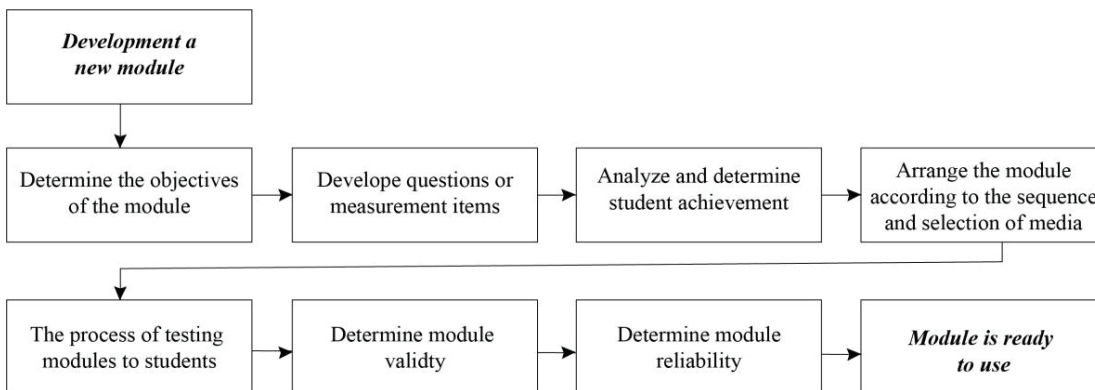


Source: (Sharifah Alwiah Alsagof, 1981)

The second module development process (Figure 4) was introduced by Russell (1974). The process begins with the determination of learning objectives and the determination of measurement items to assess student understanding after using the module. In addition, module development must be designed based on the analysis of student achievement. The modules built can be designed with different approaches based on the student's achievements and can be followed by them from various levels, i.e., excellent, average, or weak students. Then, the modules are arranged and adapted to specific media to strengthen and understand the students using the module. After that, the draft module that has been built is tested for validity and reliability. The final process is to conduct experimental tests to determine its effectiveness.

Figure 4

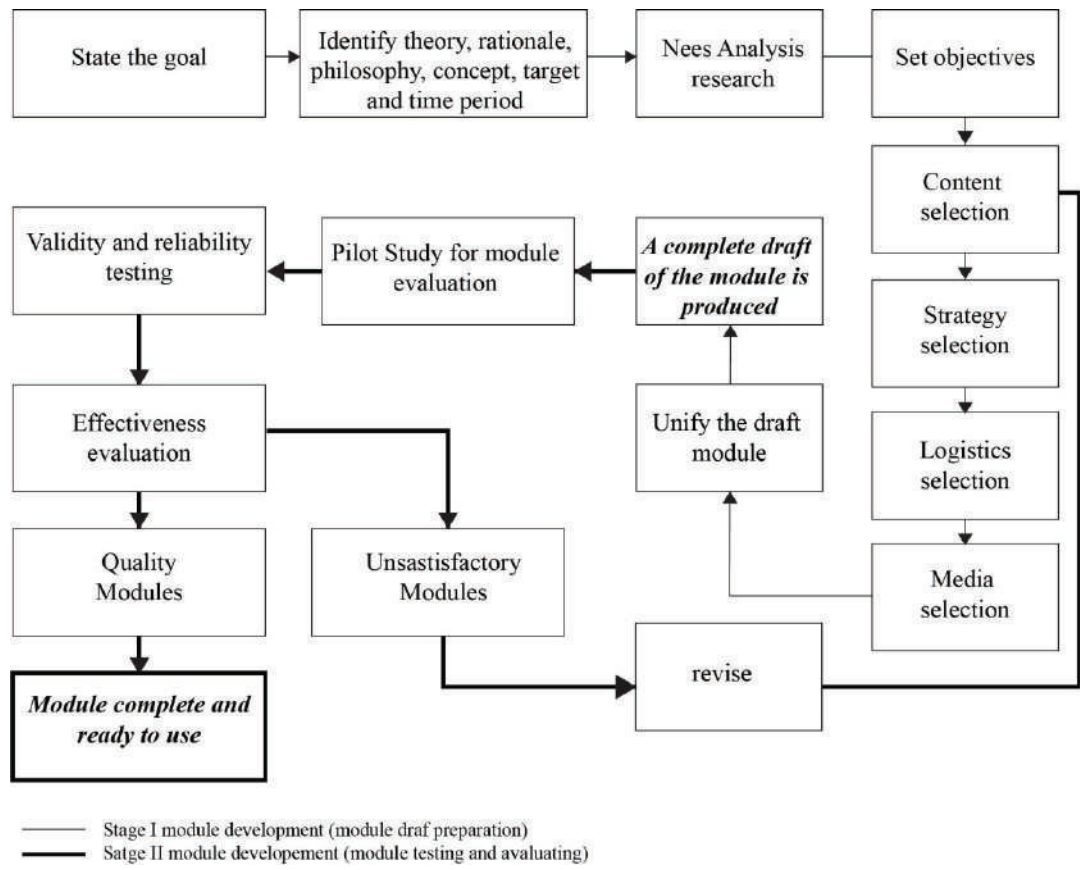
Flow Chart of the Module Development Process by Russell (1974)



The third module development process is the Sidek Module Development model, as illustrated in Figure 5. This model, introduced in 2001, has two phases: i) the module draft preparation phase and ii) the module trial and evaluation phase. The first phase has nine steps, starting with constructing module goals and ending with consolidating module drafts. At this stage, the built module has not yet been proven to be valid and reliable. While in the second phase, this model has four subsequent steps. At this stage, the built module will go through the process of validity and reliability through pilot testing. If the module is judged to be of poor quality at this stage, then the process of re-evaluation will occur. If the evaluation of the module proves to have a high value of validity and reliability, then the module is considered a complete module (Sidek Mohd Noah & Jamaludin Ahmad, 2005)

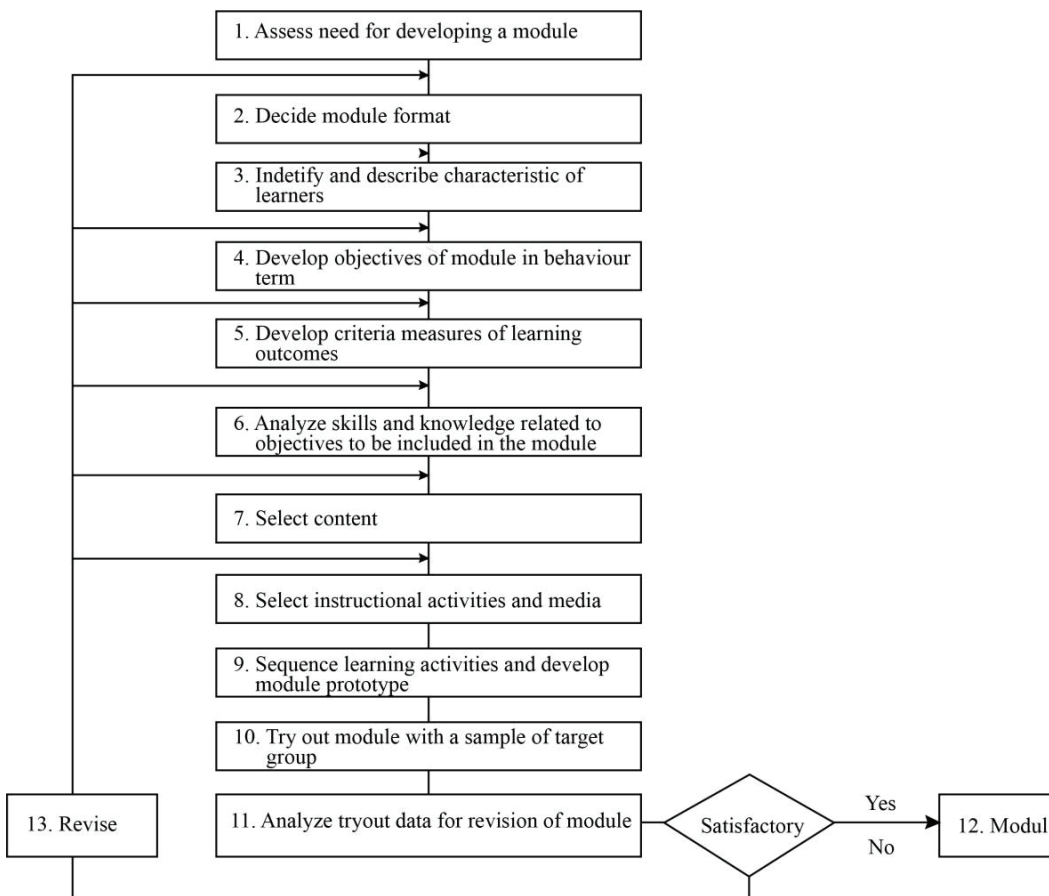
Figure 5

Sidek Model Development of Module



Source: Sidek Mohd Noah & Jamaludin Ahmad (2005)

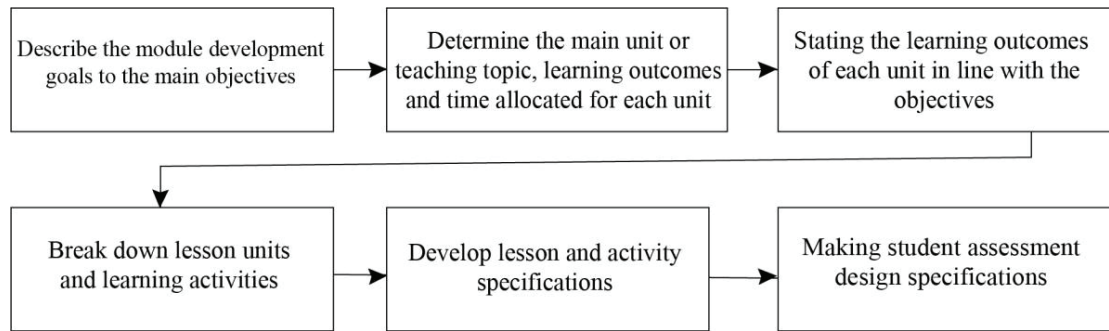
In addition, educators can also refer to the module development process introduced by Meyer (1986) in the design and development of art modules. Meyer’s model has 11 steps that begin with assessing the needs of developing a module and end with a trial of the module on the target group. If the results of the findings and feedback received are unsatisfactory, the module needs to go through a revision process. Mayer’s module design and development approach were also applied in previous studies in module development (Kiong et al., 2012, 2021; Kumaran et al., 2020; Tze Kiong et al., 2013). The steps in Mayer’s model are very suitable for developing modules of any field. The modules produced will also be of high quality if the steps recommended in this model are followed perfectly (Kumaran et al., 2020).

Figure 6*Flow Chart of Module Design and Development*

Source: Meyer G.R. Mayer (1986)

Besides the design methods refined before, there is another method that can be used as a guide in module development by Gagne et al. (2005). There are six steps in the development process that have been introduced (Figure 7). The module development process was introduced and started by translating the module development goals into the main objectives of the module; the second is by determining the main unit or topic's teaching, the learning outcomes, and the time allocated to each unit in the module. After that, the module's content continues by stating that each unit's learning outcomes must align with the objectives. Next, the content must be divided according to lesson units and learning activities. The next process is to develop the specifications or characteristics of the module lessons and appropriate learning activities. The development process is concluded by making the assessment design specification for students to achieve the main goal of the designed module.

Figure 7

Module Design and Development Steps

Source: Gagne et al. (2005)

Although the development of the teaching and learning modules that are produced need to go through a long-term process to ensure the quality of the resulting modules, the experience can allow educators to create more effective and interesting learning for their students (Kiong et al., 2021). In addition, the use of teaching with various approaches in the developed modules can help educators address the various needs of their students and ensure that all students get an effective impact. This can be seen in a module development study that uses a combination of a self-teaching approach and digital application in learning that can make learning more effective with two-way communication (Roger et al., 1994). By designing modules combining different teaching modes, such as visual, auditory, and kinesthetic, educators can help students with different learning styles achieve their learning outcomes (Sapon et al., 2023).

Although module development is important, the development process also faces various challenges. Effective and engaging module development requires considerable time, resources, and expertise. In addition, in an educational environment constantly changing with new trends and technologies, educators may face difficulties in keeping up with the latest developments and adopting the best methods in module development. However, by taking advantage of professional development opportunities and resources, educators can continue to improve their knowledge and skills and improve the quality of teaching and learning modules in art education. The selection of various approaches to the module development process presented (Table 1) depends on the educators following the steps suggested to guarantee the quality of the modules produced (Sidek Mohd Noah & Jamaludin Ahmad, 2005). Ultimately, effective module development is essential in preparing students with the skills and knowledge to succeed in the arts and go further in the field.

Table 1

Comparison of Module Development Process Based on Various Model Approaches

No	Development Process	Rusell (1974)	Sleeman & Rockwell (1976)	Meyer (1986)	Model Sidek (2001)	Gagne et al. (2005)
1.	Goal setting				√	
2.	Need Analysis Study			√	√	
3.	Determinations of the target group/ students		√	√	√	
4.	Selection of concepts, skill principles, procedures, or module format/time/theory/rational/philosophy		√	√	√	√
5.	Objective determination	√	√	√	√	√
6.	Test preparation/ questions development/ student evaluation	√	√	√		√
7.	Determination of measurement criteria			√		
8.	Selection of module content		√	√	√	√
9.	Selection of learning strategies/ lesson plans		√		√	√
10.	Selection of logistics (other module's tools)				√	
11.	Determination of learning activities			√	√	√
12.	Media selection	√	√	√	√	
13.	Organise modules	√	√		√	
14.	Pilot study using the module				√	
15.	Module evaluation/ field study/ test the module on a sample	√	√	√	√	
16.	Analyse and determine student achievement/skills and knowledge/measure learning outcomes/effectiveness assessment	√		√	√	
17.	Determination of validity	√			√	
18.	Determination of reliability	√			√	
19.	Evaluation or revise			√	√	

Types of Art Education Modules

Art education modules come in many forms and types, each with its own characteristics and benefits. The type of module that the educator chooses to use depends on the learning outcomes, student needs, and the educator's teaching goals. Understanding the different types of art education modules and their applications is essential in designing effective and engaging student learning experiences.

One type of art education module is project-based learning (PBL). In this module, students carry out practical projects involving research, collaboration, and critical thinking. Project-based learning modules are effective in helping students develop problem-solving skills, creativity, and collaboration, as well as content knowledge. Most of the past studies in developing PBL modules also showed positive feedback towards using modules that use the PBL approach in making Batik Pelangi Visual Arts Education (Maaruf & Basri, 2019a). Meanwhile, a study by Snepvangers and McAlpine (2006) using an online PBL Module approach to teach Art and Design Education has found that the effectiveness of PBL learning is dependent on the teacher's way of handling and this approach has also enabled lessons to learn independently and reduce dependence on the teacher.

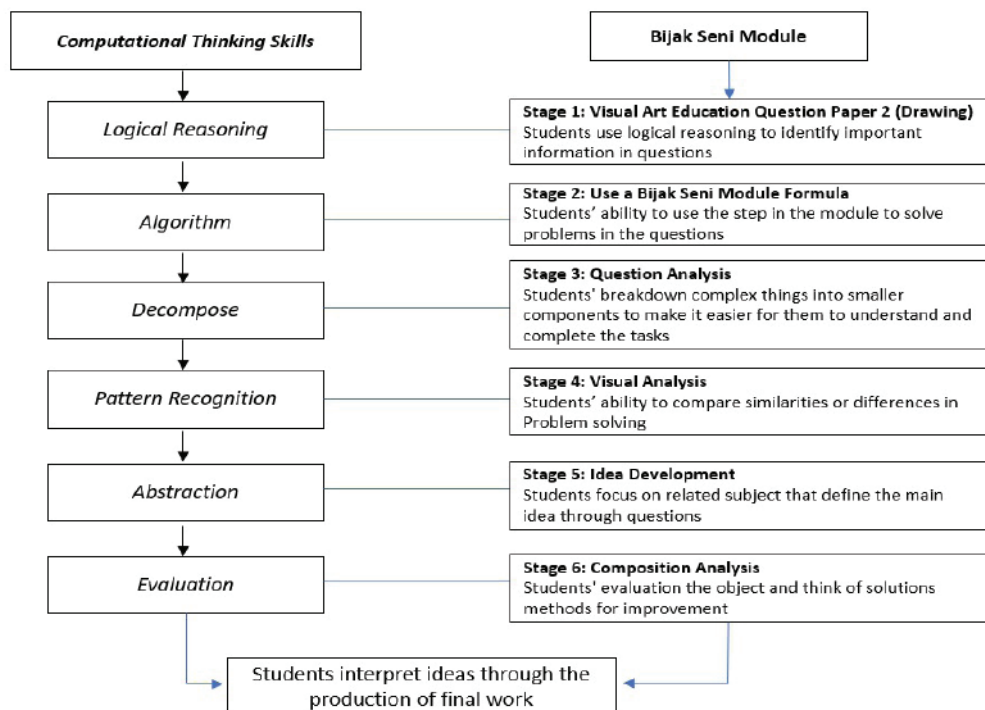
Next, another type of module in Art Education is the skill-building module. In this module, students learn specific skills or techniques related to a particular medium or discipline (Priyanto, 2020). The skill-building module is essential in providing students with a solid

foundation of technical skills they can use in their artistic practice. This statement aligns with previous studies such as Xu et al. (2021), showing that students successfully increase their interest, learning efficiency and artistic creation ability effectively by applying the developed drawing module. In addition, the creation of the Visual Arts Language Module (BSV) as a teaching and facilitation material in helping students build cognitive skills using BSV in the primary topics of art and design principles of Visual Arts Education has proven a good achievement after applying the module (Darliz Jenal & Harozila Ramli, 2020).

In addition to project-based learning modules and skill building, other types of art education modules can be used in teaching. For example, inquiry-based learning modules involve questions or problems being presented to students and allowing them to investigate and explore relevant solutions. Inquiry-based learning modules can help students develop critical thinking, research, and analytical skills and foster creativity and independence in generating ideas and problem solving. Several studies in the development of inquiry-based Art Education modules, such as the study of Art Wise Modules by Harrinni Md Noor and Irma Rahayu Ibrahim (2019), are designed to encourage students to think critically in producing works. In addition, the module can improve drawing and painting skills and help students complete complex fine art questions with inquiry and computational thinking methods, such as Figure 9, in generating ideas to produce works of painting. The development of the inquiry-based "STEAM" Module in the study by Suraya Bahrum et al. (2018) was designed to see the applicability of Science, Engineering Technology, and Mathematics combined in Visual Arts Education known as (STEAM). The development of this type of module, also in line with 21st-century learning, has positively impacted the implementation of the integration of STEM and Visual Arts Education because it emphasises collaborative communication learning, problem-solving processes, and student-centred learning in exploration (Suraya Bahrum et al., 2018).

Figure 9

Learning Flow Chart Bijak Seni Module



Source: Modified from Harrinni Md Noor and Irma Rahayu Ibrahim(2019)

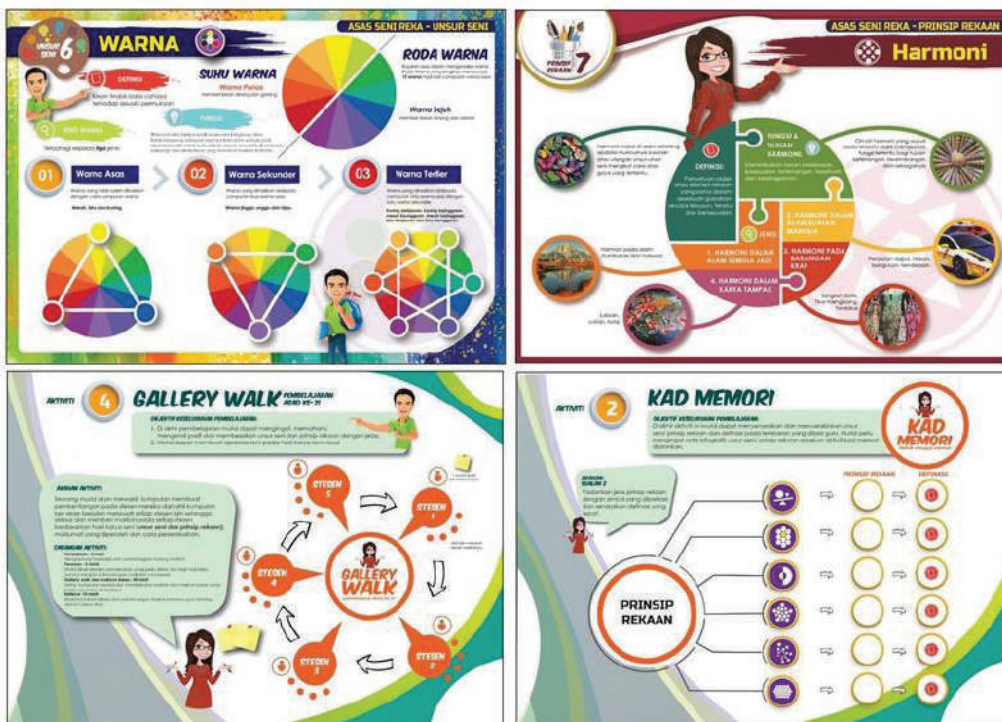
Another type of module is the digital media module. With the increasing use of technology in education, the digital media module has become an important component and received a good response in applying it in Art Education. This is clearly proven when there are many previous studies Faizura Nur Mohamed Jamion et al.(2020); Guo et al.(2020); Harozila Ramli

et al. (2019); Mao and Zhang, (2021); Maaruf et al.(2019) have developed modules with the use of technology. This module includes instructional videos, online tutorials, digital tools, and resources that allow students to explore and experiment with different mediums and techniques. Previous studies related to the development of online art modules by Wu and Xu (2022) have designed a curriculum and developed a teaching platform, "Moodle", with a special Art Design Basics course for teaching teachers. This study has shown the development of the Moodle module, a mobile online learning system application with various functions and exciting content such as creating art, watching learning videos, learning activities, sharing experiences and information and exchanging messages between users.

In addition, the use of technology using learning video and interactive approaches in the I-GEP module has emphasised the design of interesting infographics to help students understand the topic of art elements and design principles in Visual Arts Education (Figure 10). Several elements, such as symbols to help students remember art notes, teacher and student characters, learning videos, and the characteristics of 21st century learning activities, namely Gallery Walk, have been emphasised in the module (Mohammad, 2019). The study's findings show a significant improvement in student achievement after using the I-GEP module, where it is proven that no student has failed the assessment test after following its use. In addition, the findings also show that there is an increase in post-test scores by both male and female students. However, female students are more motivated after using the module by Maaruf et al.(2022) and Mohammad (2019). This shows that digital media modules can particularly attract the interest of technology-savvy students and students who prefer using digital tools and resources rather than traditional art materials.

Figure 10

I-GEP Module Content Design that has Interesting Infographics, Symbols, and 21st Century Learning Activities



Source: (Mohammad, 2019)

Although there are advantages to the various module types discussed, it still has certain limitations. For example, project-based learning modules may be time-consuming and require significant resources and planning. However, skill-building modules may be less appealing to students who prefer a more creative and open learning experience. Therefore, the thing that needs to be considered in the development of the module is to consider

the needs of the educator himself and the existing experience of the students so that the module produced is suitable for use in their learning (Siti Rohana Salleh & Nordin Mamat, 2020). The study by Nor Azizah Mohammad and Suziyani Mohamed (2020) also states that an effective teaching method to help teachers deliver learning is by preparing a complete learning module containing activities that are suitable for students because the guidance in the module helps teachers always be ready to continue applying it to students. Additionally, incorporating different modules can help educators address their students' diverse needs and learning styles and keep them engaged and motivated to learn. Finally, understanding the different types of art education modules and their applications is essential in designing effective and engaging learning experiences that can indirectly improve student learning outcomes.

Theory Application

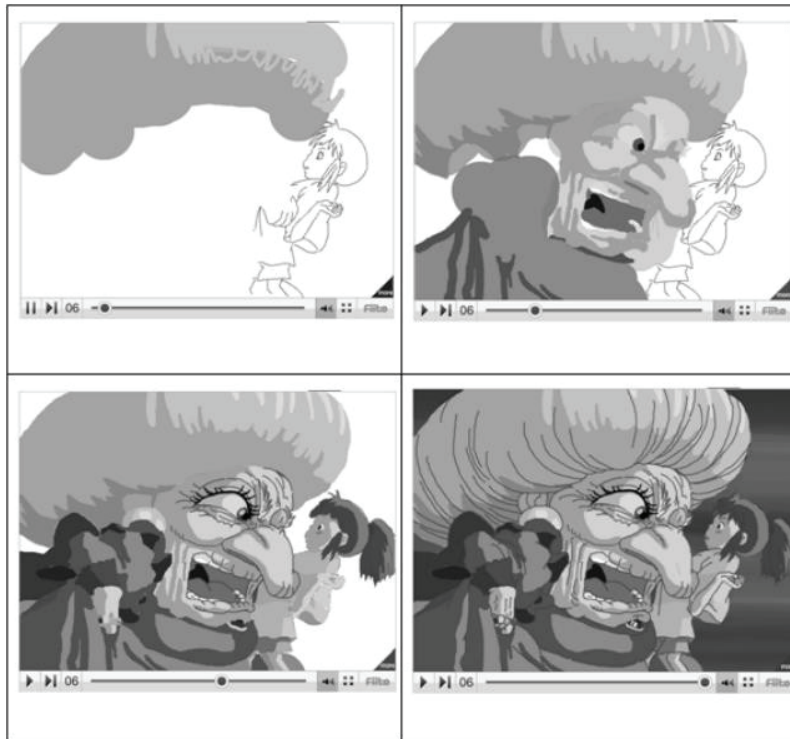
Applying theory is an important component in developing effective modules in art education. Theories provide a framework for understanding the complex processes involved in learning and can help educators design sound instructional approaches and evidence-based practices. By incorporating theory into the design of art education modules, educators can create interesting and practical learning experiences to promote student learning outcomes. Schunk (2020) argues that the main purpose of learning theory is to improve teaching, and effective teaching requires the best theoretical perspective for the type of learning encountered and its implications for teaching. Besides, Harasim (2017) also believes that theory is essential in educational practice because understanding theory can help educators improve and practice in practice, reshaping refining work and being used to translate research findings into recommendations for educational practice.

A theoretical framework that is commonly applied in art education is constructivism theory. According to this theory, learning is an active and constructive process where students build new knowledge and understanding based on existing knowledge, experience, and influence from the environment, ultimately leading to behavioural changes in terms of cognitive, effective, and psychomotor (Mustafa & Roesdiyanto, 2021; Prater, 2015). Constructivism also explains the learning process of how knowledge is organised in the human mind, where the knowledge cannot be transferred perfectly by the instructor, but rather, the students themselves need to build knowledge from their own experiences (Leng et al., 2012). In art education, constructivism can be applied through an inquiry-based learning approach, where students are encouraged to explore and experiment with different mediums and techniques and create their unique artistic expression (Tomljenović & Vorkapić, 2020). By applying constructivist theory in module development, educators can create learning experiences that are interesting, authentic, and relevant to students' interests and experiences.

Applying a theoretical framework like the social learning theory can offer significant benefits in art education. Proposed by Albert Bandura (1977), this theory underscores the role of social interaction and environmental influence in learning and individual growth. It highlights that individuals acquire knowledge by directly observing peers, parents, and teachers or indirectly via media (Bandura, 1977). Art education can integrate the social learning theory through project-based learning, facilitating collaborative creative projects, idea sharing, and mutual feedback among students (Snepvangers & McAlpine, 2006). This approach can be enhanced by incorporating technology and media, such as showcasing relevant examples or tutorials. Notably, a prior study by Liao and Ho (2011) applied the social learning theory to art education by utilising online observational learning through Cloud and Web computing systems (Figure 11), demonstrating a positive impact on students' art learning. This approach enables educators to craft learning experiences that nurture creativity, critical thinking, and student collaboration when integrated into module development.

Figure 11

Video of Simulation of The Note-taking Process in the Cloud Observational Learning System for Art Education Through E-Learning in Taiwan.



Source (Liao & Ho, 2011)

Furthermore, the theory of multiple intelligences is the theoretical framework that can be applied in developing art education modules. The theory introduced by Gardner (1983) explains that individuals have different types of intelligence, such as verbal-linguistic, logical-mathematical, visual-spatial, kinesthetic-body, musical, interpersonal, and intrapersonal intelligence (Santrock, 2008). According to this theory, teachers also need to create differences in teaching needs based on the diversity of student intelligence. There have been several previous studies in the context of visual arts conducted to explore students' attitudes towards the theory of multiple intelligences, such as the study by Abdelhak and Romaissa (2022), its application in learning art history by Erkan (2012), and to investigate the view of art teachers on the effects of the theory of multiple intelligences in student creativity in art (Castillo et al., 2016; Fernández et al., 2019; Fuentes, 2018; Garin Vallverdu et al., 2016; Jung & Chang, 2017). A study by Tetikci et al.(2023) has found that teachers lack awareness and do not have extensive knowledge about the theory of multiple intelligences due to the limited application opportunities given at the school level. Therefore, to increase awareness among educators of the merits of this theory, educators can create art education modules by incorporating activities that cater to a variety of inclusive intelligence and meet their student's diverse needs and learning styles.

In addition, ecological systems theory can also be applied in the development of art education modules. This theory suggests that human development is influenced by the interaction between individuals and their environment (Bronfenbrenner, 1994). In art education, the application of this theory in learning is a cross-curricular approach because this theory can be applied by combining activities that involve students in creating art that reflects their environment, such as creating art inspired by local flora and fauna, or by creating art that evokes awareness of environmental issues (Pepler et al., 2023). Although the use of this theory is still limited in the context of art research, its diverse approach can be presented in a broader educational discourse.

Moreover, cultural-historical activity theory or CHAT is another theoretical framework that can be applied in developing art education modules. This theory emphasises the role

of cultural and historical context in shaping human activity and understanding (Cliff et al., 2022). In art education, this theory can be used in modules to explore the cultural and historical contexts in which different art forms have emerged and developed and to help students develop a deeper appreciation and understanding of the role of art in different cultures and societies. In the context of Art Education in Malaysia, when there has been a change in the curriculum in the national education system to implement the Secondary School Standard Curriculum (KSSM) in the pursuit and learning of Visual Arts Education (Curriculum Development Department, 2018; Iktisas Circular No. 6, 2019) there are many fillings involving the culture and history of society in Malaysia as well as in the west has been contained in the latest secondary school curriculum measures (Harleney Abd Arif et al., 2018; Md Nasir Ibrahim et al., 2014, 2019, 2020). Studies such as Du (2020), Dyck (2021), Maaruf et al. (2013), Maaruf and Basri (2019) support the culture-based art learning approach in society. Therefore, a module that applies this theory can be thought of by educators to develop cultural and art history further learning for students.

Although there are various approaches to applying theory in the development of art education modules, it can be something complex and make it difficult for educators to apply it effectively in teaching and learning practice (Gerber & Eybers, 2021; Oreski et al., 2022; Trisnawati & Sari, 2019; Xiao et al., 2020). In addition, students' needs and learning styles vary, making it challenging for educators to design attractive and effective modules for all students (Kamsin et al., 2022; Purwasih et al., 2022). To overcome these challenges, educators must carefully consider learning outcomes, instructional goals, and the needs of their students when using theory in module development.

In conclusion, applying theory in developing art education modules can help educators create attractive, effective, and inclusive learning experiences for their students. By combining theories such as constructivism, social learning theory, multiple intelligence theory, cultural-historical activity theory, and ecological systems theory, educators can create art education modules that promote student learning outcomes and foster creativity, critical thinking, and appreciation for diverse cultures and environments.

Validity and Reliability

Module validity and reliability are important concepts in module development research and evaluation. In developing a module, the validity process needs to be implemented where it refers to a measurement tool by Ahmad and Noah (2001), an effort to accurately measure the content or items in the measurement (Mohd Majid Konting, 2005); Murphy, 1988). In contrast, reliability refers to the consistency and stability of measurement or evaluation tools over time and across different contexts (Sidek Mohd Noah, 1997). In developing an art education module, validity and reliability are essential to ensure that the module effectively achieves the desired learning outcomes.

One way to ensure validity in module development is to determine the validity of the module's content itself. Rusell (1974) suggested five conditions that must be complied with to ensure that the module developed can meet the validity: i) the module must meet the target population, ii) the teaching situation or the method of implementing the module must be satisfactory, iii) the time taken to complete the module must be sufficient, iv) the module must succeed in improving student achievement performance and v) the module must succeed in changing the student's attitude towards excellence. Hence, from this requirement, a questionnaire instrument was developed (Figure 2) (Rusell, 1974), translated into Malay and made into a Likert scale item by Jamaluddin Ahmad (2002) to obtain module validity from module experts.

Table 2

An example of a module content validity questionnaire

Scale Interpretation:

5- Strongly Agree 4-Agree 3- Uncertain 2- Disagree 1- Strongly Disagree

No	Statement	Scale options				
1	The content of this module meets its target population	1	2	3	4	5
2	The content of this module can be implemented perfectly	1	2	3	4	5
3	The content of this module corresponds to the time allocated	1	2	3	4	5
4.	The content of this module can improve student achievement performance	1	2	3	4	5
5.	The content of this module can change the attitude of students towards excellence	1	2	3	4	5

* Source: Russell (1974) and Jamaluddin Ahmad (2002)

To determine the validity calculation for module content based on the instrument above, the formula for calculating the percentage of module validity achievement is the percentage calculation method or PCM (Figure 12) by Tuckman and Waheed (1981). In their view, the achievement of a total of 70 per cent obtained can be considered to have mastered or reached a high level of achievement of the validity of the module. The total score given by the expert is divided by the maximum score (25) and then multiplied by the value of 100% to obtain the total percentage of validity. The score obtained is converted into decimal form, for example, 80 per cent as 0.80. With that amount, achieving content validity of 80 per cent can be considered to have a content validity coefficient of .80. This method is also supported and has been applied by previous studies such as Armizawani and Sharul Effendy (2021); Mohd Shapri and Che Ahmad(2020); Nur Izwani and Che Nidzam(2020); Nor Tutiaini (2019) in obtaining the validity of the content of the built module.

Figure 12

Module Content Validity Coefficient Formula (Percentage Calculation Method) Source: Tuckman and Waheed (1981)

$$\frac{\text{Total Experts' Score}}{\text{Total Maximum Score}} \times 100\% = \text{The Content Validity Percentage (PCM)}$$

Another method for determining the validity of module content is the Content Validity Index (CVI) recommended by Lynn (1986), as shown in Table 3. CVI is a data analysis method collected empirically to determine the validity of the content or instrument used in the study. Researchers can determine the validity of module content from the aspects of i) module presentation, ii) module content and iii) language presentation (Armizawani & Sharul Effendy, 2021). Previous studies using the CVI validation method in the validation of module content are aligned with Hamid et al. (2021), Idrus et al. (2022), Lau et al. (2019), Mahmud et al. (2022), Mensan et al. (2020), Ping and Osman (2019), and Setambah et al. (2017).

Table 3

The Scale, Formula, Procedure and Range Accepted for the CVI Method

Details												
1.	Scale	Ordinal Divide the ordinal scale into two groups for example scale 1, 2, 3, 4 so that 1 and 2 represent disagree and vice versa.										
2.	Formula	CVI = n – numbers of evaluators who agreed; N – sum of evaluators										
3.	Range accepted	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">N</th> <th style="width: 50%;">CVI value</th> </tr> </thead> <tbody> <tr> <td>2-5</td> <td>1.00</td> </tr> <tr> <td>6</td> <td>≥0.83</td> </tr> <tr> <td>7</td> <td>≥0.86</td> </tr> <tr> <td>8-10</td> <td>≥0.78</td> </tr> </tbody> </table>	N	CVI value	2-5	1.00	6	≥0.83	7	≥0.86	8-10	≥0.78
N	CVI value											
2-5	1.00											
6	≥0.83											
7	≥0.86											
8-10	≥0.78											
Mean CVI is mean of all CVI for each item												

Reliability refers to the stability, consistency, prediction, and accuracy of the instrument used when tested several times (Ghazali & Sufean, 2018). According to Sidek and Jamaludin Ahmad (2005), the module’s reliability reflects the level of consistency of the steps contained in the module. On the other hand, reliability can be obtained by conducting pilot tests in developing art education modules. Pilot testing involves using a module with a small group of students to identify any issues or challenges and make necessary adjustments before implementing it with a real group. This process can help ensure the module accurately measures the intended learning outcomes and effectively achieves the desired results. One way to measure the module’s reliability is to use SPSS statistical software to calculate the Cronbach’s Alpha coefficient for each item and instrument used. Cohen et al. (2017) stated that there is an acceptable Cronbach’s Alpha coefficient value score, as shown in Table 4:

Table 4

Reliability Scores

Level of Reliability	Cronbach’s Alpha Score
Not Reliable	<0.6
Low	0.60-0.69
Enough	0.70-0.79
High	0.80-0.90
Very High	>0.90

In conclusion, ensuring the validity and reliability of art education modules is important to promote effective student learning outcomes. Educators can ensure validity and reliability by conducting pilot tests, using various assessment methods, and implementing continuous assessment and evaluation. Educators can ensure that they provide high-quality and compelling learning experiences by prioritising validity and reliability in developing art education modules.

Module Evaluation

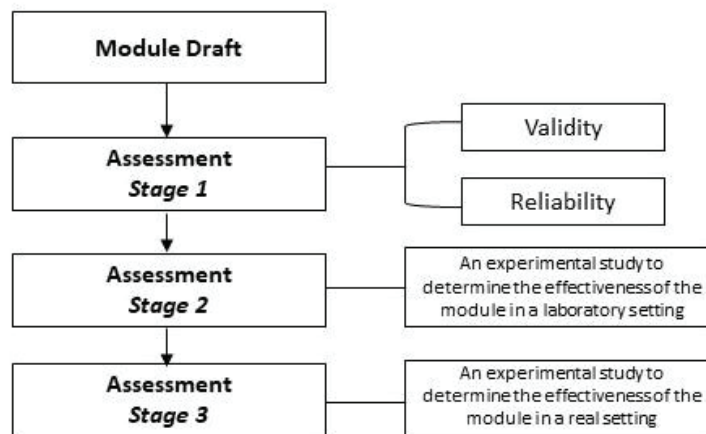
Module evaluation is a crucial post-development process aimed at aiding educators in gauging the efficacy of their teaching strategies within art education modules. This involves gathering input from students, instructors, and stakeholders to pinpoint strengths, weaknesses, and enhancement areas. The assessment helps identify effective elements driving student learning outcomes, prompting revisions for less effective components. It

is essential to document this evaluation for feedback on module activities (Adnan Khamis, 1998). Various evaluation methods are available, including questionnaires and activities within the module itself, as proposed by Russell (1974). Lee and Osman (2012) created a module evaluation questionnaire aligning with this notion, assessing module quality across multiple components and measuring comprehension and efficacy. Factors influencing module development encompass student demographics, education level, cognitive abilities, background, content, and effectiveness gauged through tests, training, and successful module completions (Russell, 1974).

According to Sidek Mohd Noah & Jamaludin Ahmad (2005), module evaluation encompasses three key stages (Figure 5): module development, effectiveness assessment in a laboratory context, and evaluation in a real-world scenario. The first stage involves developing the module and assessing its validity and reliability, focusing on achieving high levels of both. The second stage pertains to evaluating the module's impact within a laboratory setting, requiring designers to conduct experiments measuring variables like achievement, motivation, and self-concept. Previous studies by Manatad (2020), Mulhayatiah et al. (2019), and Sumarmi et al. (2021) employed experimental assessments to gauge student achievement across various module types. If the evaluation significantly improves variable scores from a statistical perspective, the module proves effective and suitable for recommendation. The third level of evaluation involves testing the module's real-world applicability to establish external validity. This step necessitates a research process utilising an ex-post facto study design, facilitating a cause-and-effect comparative analysis of module effects between experimental and actual settings (Sidek Mohd Noah & Jamaludin Ahmad, 2005).

Figure 5

Module Evaluation Process



Besides the assessment explained before, module assessment can also be implemented using formative assessment. Formative assessment aims to provide feedback to the instructor on how much the program's impact meets the objectives throughout teaching (Morrison et al., 2007). It also involves continuous feedback and evaluation throughout the learning process that can help educators identify areas where students may experience problems and require additional support or modifications to the module as needed. Abdelmohsen's (2020) study has implemented a formative assessment in applying the ADDIE model in the implementation phase of the module, which aims to measure the development of student's critical thinking, collaboration, and writing skills throughout the learning process. This type of assessment allows educators to adjust the module and ensure that it effectively meets the needs of their students.

Another method of assessing art education modules is with summative assessment. Summative assessment involves assessing student learning at the end of a module or course unit through a final project or exam (Abdelmohsen, 2020). This assessment can help educators determine whether students have achieved the desired learning outcomes and

provide valuable feedback about the module's effectiveness. In addition, peer observation and feedback methods can also be used to evaluate modules (Simpson et al., 2019). Art educators can observe each other's teaching methods and provide constructive feedback on areas of strength and areas that may need improvement. This assessment can help educators identify new teaching strategies and techniques and provide opportunities for professional development.

Next, another valuable method for module evaluation involves student self-assessment, enabling educators to gather insights into module effectiveness and identify areas requiring additional support (Alturki & Stuckenschmidt, 2022; Aricò & Lancaster, 2018; Sadikin & Hardianti, 2021). Moreover, technology-based approaches like online surveys, social media platforms, and digital feedback tools can collect input from students and stakeholders (Alwan et al., 2007; Suhail et al., 2023). Art educators should adopt a holistic approach by considering student engagement, motivation, and overall satisfaction (Bartman & Prins, 2018; Ejsmont, 2020). Integrating these factors with traditional assessment methods offers educators a comprehensive understanding of module effectiveness, facilitating necessary improvements for enhanced student learning outcomes.

In general, module assessment is a dynamic and ongoing process involving the collection of feedback from various sources and using that feedback to enhance teaching and learning strategies. By employing various assessment methods and taking a holistic approach, art educators can ensure the effectiveness of their modules in promoting student learning outcomes and providing a high-quality art education experience. In conclusion, module assessment is a vital component in art education that helps educators ensure the effectiveness of their teaching and learning strategies in promoting student learning outcomes. By utilising formative and summative assessment methods, educators can gather feedback from students and other stakeholders, make real-time module adjustments, and assess overall effectiveness. Prioritising module assessment allows educators to provide students with a high-quality and impactful art education experience.

Professional Development

Professional development is a lifelong learning process in which educators respond to changes in their teaching concepts (Rihter et al., 2023). More specifically, it is a set of programs or activities involving teachers individually or collectively to transform their knowledge into practices that benefit their students (Avalos, 2011; Beaucham et al., 2014). Continuous professional development is important for art educators to always get the latest information with best practices in learning materials, especially in module development. This statement is also supported when best practices in learning are emphasised in professional collaboration between art educators, field experts, and artists to ensure that students benefit, address learning issues, and meet their learning needs (Hayes et al., 2021; Lind, 2007; Rihter et al., 2023). This is because working collaboratively can positively affect teachers' work in planning the curriculum in art education (Lind, 2007). With the rapidly changing educational landscape, arts educators must continue developing their knowledge and skills to effectively create and deliver high-quality teaching and learning modules. Professional development opportunities and resources can provide arts educators with the tools and knowledge to create effective modules that improve student learning outcomes.

There are various professional development opportunities and resources available for art educators, such as workshops, conferences, webinars, and online courses (Gümüş & Bellibaş, 2023). These opportunities allow art educators to connect with other professionals in their field, gain new insights, and learn about new trends and practices. For example, workshops on curriculum design or teaching strategies (Evers, 2018) can help art educators develop their module development skills, while conferences can provide networking opportunities and allow educators to gain exposure to a wider variety of ideas and perspectives (Jamil et al., 2018; Spilker et al., 2020). Additionally, online courses or webinars can provide flexible and accessible learning opportunities for educators who cannot attend face-to-face events (Brasili & Allen, 2019; Bryson, 2020; Dolowitz et al., 2021). By taking advantage of this

opportunity, art educators can improve their knowledge skills, ultimately improving the quality of teaching and learning modules in art education.

DISCUSSION

The overall idea presented in the module assessment discussion highlights the importance of continuous assessment and feedback in art education. By employing various assessment methods and a holistic approach, art educators can ensure their modules effectively promote student learning outcomes and provide a high-quality art education experience. However, it is important to recognise that module assessment can be complex and challenging. Gathering feedback from multiple sources, analysing data, and making necessary module adjustments can be time-consuming and resource-intensive. Additionally, educators must balance the need for assessment with maintaining a positive learning environment and supporting their students.

Furthermore, the effectiveness of module assessment can also depend on the quality of assessment tools and methods used. Educators must carefully select appropriate assessment methods that align with learning objectives and student populations, providing meaningful and actionable feedback. Despite these challenges, the significance of module assessment cannot be overstated. By prioritising continuous assessment and feedback, art educators can improve their teaching and learning strategies and offer students a high-quality art education experience.

This study on the development of teaching and learning modules in art education provides a comprehensive overview of the main themes and considerations involved in creating effective art education modules. One strength of the study is its emphasis on the importance of assessment and continuous evaluation in module development. The study underscores the importance of ensuring effective art education modules that promote student learning outcomes and deliver a high-quality learning experience by offering various methods to assess module effectiveness, including peer observation and student self-assessment. However, the study could benefit from a deeper discussion of the challenges involved in module assessment. While it briefly acknowledges the complexity of the assessment process, it could provide a more detailed insight into the difficulties of collecting feedback from various sources and analysing data. Moreover, the study could explore potential biases and limitations of different assessment methods and offer guidance on overcoming these challenges.

Another area for improvement in the study is its discussion of various art education modules. While it provides a general overview of online and blended learning, it could benefit from a more detailed examination of the benefits and drawbacks of each module type and how they can be effectively integrated into the art education curriculum. Additionally, the study could explore other innovative approaches to module development, such as project-based learning and interdisciplinary collaborations.

With these limitations, the study offers a valuable resource for art educators seeking to create effective teaching and learning modules. By emphasising the importance of continuous professional development and the need for clear learning outcomes, this research outlines the significance of a holistic approach to module development. Overall, this research provides a comprehensive overview of the key considerations in creating effective art education modules. It is also a valuable source for art educators looking to enhance their teaching and learning practices.

CONCLUSION

In conclusion, developing effective teaching and learning modules is a complex and ongoing process that requires careful consideration of various factors. Throughout this comprehensive study on module development in art education, several key themes

have emerged as critical to the success of art education modules. These themes include the importance of continuous professional development for art educators, the need for clear and measurable learning outcomes, the application of relevant theories, and the significance of meticulous assessment and evaluation.

This research provides a valuable resource for art educators seeking to create effective teaching and learning modules, emphasising the importance of a holistic and collaborative approach to module development. By offering practical guidance and resources, the research outlines the potential of art education modules to enhance student learning outcomes and provide a high-quality learning experience.

Overall, the study highlights the crucial role played by art education in nurturing creativity and critical thinking, serving as a valuable source for educators aiming to create impactful art education modules. Art educators can create modules that effectively promote student learning and provide engaging and inspiring learning experiences through ongoing professional development, thoughtful consideration of learning outcomes, and meticulous assessment and evaluation.

FUTURE RESEARCH

In the pursuit of continuously enhancing and improving art education by developing teaching and learning modules, future research can contribute significantly to this field. Firstly, comprehensive studies are needed to analyse the lasting impacts of successful art education modules on students' creativity and critical thinking development, offering invaluable insights for educators striving to create more effective modules. Secondly, future research should delve into the technological aspects of module development, exploring how technologies like virtual reality and computer-based art can enrich students' learning experiences and boost their creativity. Additionally, emphasis on inclusive module design, considering cultural diversity and various abilities, is vital for comprehensive and effective art education. Exploration of intervention studies can provide practical insights into how specific modules contribute to improved learning outcomes. By conducting focused research, the art education community can continue to advance its role in nurturing creative, innovative, and critically minded future generations, thereby addressing upcoming challenges and opportunities.

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THE EFFECTIVENESS OF IMPLEMENTING THE PROJECT BASED LEARNING MODEL ON THE CREATIVE THINKING ABILITY OF STATE PRIMARY SCHOOL STUDENTS IN INDONESIA

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ABSTRACT

One of the 21st-century competencies that needs to be developed is the ability to think creatively. Project-based learning is a learning model that can support the achievement of creative thinking skills. This research aims to determine the effectiveness of implementing the project-based learning model on creative thinking abilities in State Primary School students in Indonesia. The research method used was experimentation with a sample of 102 people. The sample in this research was fifth-grade students at state schools in Indonesia. The data collection technique used is a creative thinking ability test that is credible and validated by experts. The research results show that the significance value of $t = 0.003$ is smaller than $\alpha = 0.05$, with a t count value of 3.226 and a t table value of 1.672. The calculation result of the t count $>$ t table is $2,500 > 1,672$. The research results show that applying the project-based learning model can effectively improve the creative thinking abilities of fifth-grade students at State Primary Schools. Implementing the project-based learning model as a variation of the learning model is recommended to optimise students' creative thinking abilities. In further research, it can be carried out with broader objects.

INTRODUCTION

In the era of Industrial Revolution 4.0, educational reform encourages schools to change the use of a knowledge-based learning paradigm to a life-skills learning paradigm or competency-based learning. Furthermore, schools are also encouraged to apply approaches, models, and strategies in the teaching and learning process. This means that students' life skills are expected to be able to find and solve life problems through critical thinking, creative thinking, investigation, and vocational work (Susanto, 2018, p. 13). Following the aim of education in Law No. 20 of 2003, it is to develop the potential of students to become human beings who have faith and devotion to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and democratic citizens who are responsible. This means that this law hopes that education can make students competent in their fields (Nurjan, 2013, p. 79). In this regard, education has an important role in the ability to think at a high level, one of which is creative thinking.

Creative thinking is one of the stages of high-level thinking that is needed in people's lives, and humans are always faced with problems, so creativity is needed to solve these problems. Creativity is a new and original behaviour that produces productive results and is appropriate to a culture. Problem-solving requires creativity as a form of transfer that involves the application of previously known knowledge and skills to new situations (Handayani, 2019, p. 3). The indicators for critical thinking ability indicate creative thinking, namely: (1) Fluency, the ability to generate many ideas. (2) Flexibility, namely the ability to produce varied ideas. (3) Originality, namely the ability to generate new ideas. (4) Detailing, namely the ability to develop ideas so that detailed or detailed ideas are produced (Mokambu, 2021, p. 60).

Competency standards for primary and secondary education graduates (SKL) in the cognitive dimension, according to Minister of Education and Culture Regulation No. 20 of 2016, are to have factual, conceptual, procedural, and metacognitive knowledge at a technical, specific, detailed, and complex level regarding science, technology, arts, culture, and the humanities, as well as being able to relate the above knowledge in the context of oneself, family, school, community, and the surrounding natural environment, nation, state, as well as regional and international areas (Kemendikbud, 2016.p.3). In connection with Permendikbud No. 20 of 2016, the implementation of science subjects must be a vehicle for training students to be able to understand the knowledge, concepts, and principles in science, think critically, creatively, innovatively, and productively, solutions, and emphasise the ability to solve complex problems and real-life problems.

Santrock (2017, p.106) to realise the learning objectives of Natural Sciences in elementary schools so that students have knowledge, ideas, and concepts obtained from experience through a series of scientific processes. Science education needs to develop creative thinking skills in the learning process, students solving problems and plans (projects). With guidance from the teacher). Ormrod (2008) emphasises that problem-solving requires creativity as a transfer that involves the application of previously known knowledge and skills to new situations so that students' mastery of a concept does not only consist of memorising several concepts they have learned but are also able to apply the concepts they have in other aspects, namely the aspect of being able to think creatively. Following Dina's opinion (2015, p.133), to increase student creativity, teachers should be able to facilitate the development of students' creative thinking skills. This is intended so that students cannot only build concepts but also understand the application of these concepts in everyday life and technological phenomena. Creative thinking skills are one of the important aspects of life skills that must be developed through learning.

Based on observation activities, the learning process of class V students in the sample school shows that many students have been unable to channel their creativity into creating a learning product. They have quite high inventiveness and creativity. However, for some students, expressing ideas in their work seems like they need help to express ideas in their work. There needs to be encouragement and motivation or a challenge so that they can express their creativity. This is because the implementation of learning is still teacher-centred, thus limiting students in developing their potential. Teachers still need to implement innovations in trying learning models that can channel student creativity, which can encourage and motivate students to channel their creativity.

Teachers should not just transfer knowledge but also motivate students to channel their creativity into learning activities. Therefore, teachers provide learning facilities such as media, resources, and learning facilities students need during the learning process. Providing learning facilities aims to construct knowledge through direct learning experiences or group work. The learning activities carried out by students are monitored and paid attention to by the teacher and guided when they experience difficulties (Isrok'atun, 2018, p.9).

The learning model that is suitable for creative thinking skills is Project Based Learning; directly or indirectly, it can help students carry out the learning process of high-order thinking (HOT) to implement scientific learning according to the 2013 curriculum, which consists of the skills of observing, associating, trying. Discussing, communicating, and learning in the era of Industrial Revolution 4.0 consists of 4C, namely Critical thinking, Collaboration, Creativity, and Communication. The Project Based Learning Model is one option to increase student creativity in the learning process. This increase in creativity is especially in terms of expressing ideas in a work product because one of the advantages of the Project Based Learning Model is creating a work or final product as a result of the student's learning process. The application of this model is also an answer to learning challenges in the era of Industrial Revolution 4.0 (Widiasturi, 2017, p. 1431)

The Project-Based Learning Model is innovative, emphasising contextual learning using projects. Students can reflect on their ideas and opinions through projects and make decisions that influence the project results. The learning process, in general, ends with

presenting the final product (Susilowati, 2013, p.8). In the learning process using the project-based learning model, the teacher must prepare questions or project assignments. This stage is the first step so that students observe the questions that arise from existing phenomena more deeply. Secondly, designing the project plan at this stage is a concrete step in answering existing questions by preparing a project plan through experiments. Preparing a schedule is a real step in a project; scheduling is very important to carry out the project according to the targeted time. The final stage monitors project activities and developments; students evaluate the projects being worked on (Mokambu, 2021, p. 59). The research aims to determine the effectiveness of implementing the project-based learning model on the creative thinking abilities of fifth-grade students in Indonesia.

RESEARCH METHODOLOGY

The research was carried out in state elementary schools in Indonesia. A total of 21 schools were sampled. This research is quasi-experimental, with the research design used in this research being Posttest-Only Control Group Design. The data collection technique uses tests in the form of tests and documentation. The instrument has been validated by several primary school teacher education experts and tested before researching to obtain valid and reliable questions. The data analysis technique used is an independent sample t-test. However, prerequisite tests are carried out first, namely the data normality test using Kolmogorov Smirnov and data homogeneity using One-Way ANOVA.

RESULTS AND DISCUSSION

Normality Test

The normality test in this research used the Kolmogorov-Smirnov Test technique. The test criteria are based on the probability value; data is normally distributed if the value (sig) is > 0.05 . From calculations with SPSS 21, the data in the table is obtained.

Table 6

Calculation Results of Normality Tests for Experimental and Control Data Tests of Normality

	Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Creative Thinking	Experimental Class	.132	21	.200*	.904	21	.042
	Control Class	.150	21	.200	.900	21	.035

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction.

Based on the table above, it can be obtained that:

- The posttest significance value of creative thinking with the Project-based learning model in the experimental class was 0.200 with a significance of > 0.05 , so it was concluded that the data taken was normally distributed.
- The significance value of the creative thinking post-test with conventional learning models in the Control Class was 0.200 with a significance of > 0.05 , so it was concluded that the data taken was normally distributed.

Homogeneity Test

Homogeneity testing of the two dependent variables individually. The calculation of the homogeneity test in this study uses the statistical relevance test. The following are the

results of the homogeneity test based on SPSS 21 for Windows calculations.

Table 7

Calculation Results of Data Homogeneity Test Results from the Creative Thinking Test Levene's Test of Equality of Error Variances

	F	df1	df2	Sig.
Critical thinking	1,653	1	40	,206

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Kelas

The Levene Statistics value for creative thinking is obtained at 0.206 based on the above. The basis for decision-making is the Leven's Test using a significance level of 5%; that is, if the significant value is > 0.05 , then we can see that for the two creative thinking variables, it is 0.206, indicating a significant value > 0.05 , so the H_0 value is rejected, and H_a accepted. Thus, it can be concluded that the creative thinking posttest data are homogeneous.

Hypothesis Testing

After the data fulfils the normal and homogeneous requirements, the next test is to test the hypothesis. To test the hypothesis, the researcher conducted an independent sample t-test. With the criteria, H_0 is rejected if $\text{sig} < 0.05$, and H_a is accepted if $\text{sig} > 0.05$. With criteria:

Table 8

Calculation Results of Hypothesis Testing

T hitung	T tabel	Sig (2-tailed)	Standard Uji T	Information
3,226	1,684	0,003	0,05	The use of the project-based learning model is effective in the creative thinking abilities of fifth-grade students.

The research shows that using the project-based learning model is effective in the creative thinking abilities of fifth-grade elementary school students. This can be seen from the results of the independent sample t-test with a significant value of $0.003 < \alpha$ ($\alpha = 0.05$), and it can be seen that $t \text{ count} = 3.226$ with degrees of freedom $(n_{x1} + n_{x1} - 2) = (21 + (21 - 2)) = 40$ while $t \text{ table} = t(0.05, 40) = 1.684$. This means that $t \text{ count} = 3.226 > t \text{ table} = 1.684$, then reject H_0 and accept H_a . Thus, statistical analysis proves that using the project-based learning model effectively improves the creative thinking abilities of fifth-grade elementary school students in Indonesia.

DISCUSSION

Based on the research results, it was found that the use of the project-based learning model was effective in the creative thinking abilities of fifth-grade elementary school students. This shows that the project-based learning model is better than conventional learning. With the Project-based learning model, students can improve their creative thinking skills in analysing and evaluating information, raising vital questions and problems, organising them, collecting and assessing relevant information using abstract ideas, being open-minded, and communicating them effectively. As in individual and group experience-guided activities, students use creative thinking stages to investigate problems, analyse evidence, and make decisions based on experience results. In this research, researchers used four indicators of a person's ability to think creatively as proposed by (Munandar, 2012. p. 49). The indicators in this research are 1) Originality of thinking (originality) to generate unique

ideas or the ability to generate original ideas; 2) Fluency of thinking, namely generating lots of ideas that come out of thinking quickly; 3) Flexibility in thinking (flexibility) to produce a variety of ideas for answers or questions, see a problem from different points of view, and be able to use various approaches or ways of thinking; 4) Elaboration of thought (elaboration) is the ability to develop ideas and add or detail details of an idea object or situation so that it becomes more interesting.

Judging from the indicators of problem-solving ability, the 1st indicator of originality of thinking (originality) was obtained with a score in the experimental class of 77.14, meaning that several students worked on solving questions on the answer sheet by generating unique ideas. Meanwhile, in the control class for the indicator of understanding the problem, the score was 65.71, meaning that only a few students who worked on solving the questions on the answer sheet produced ideas that came out of their thinking; this was because students were less able to think and generate unique ideas. For the 1st indicator, the highest average was obtained in the experimental class because students seemed to enjoy learning more using the project-based learning model.

For the second indicator of fluency in thinking, the score obtained in the experimental class was 82.19, the same as in the control class, 77.14. This shows that most students can produce many ideas from thinking about the questions given correctly, but there are errors in explaining the function of organs in the control class. Meanwhile, in the experimental class, many students can produce many ideas by thinking about the questions given correctly and providing correct and precise explanations. This indicator also shows that students understand concepts better by planning solutions.

For the third indicator of flexibility of thinking (flexibility), the highest was obtained in the experimental class, namely 89.29, greater than in the control class, namely 75, where students produced a variety of ideas for answers or questions, looking at a problem from different points of view. Different and able to use various approaches or ways of thinking compared to the control class. In the fourth indicator, explaining and checking the truth of what has been obtained, the highest score in the experimental class was 86.43, higher than the control class score, 58.33. Many students still need to develop ideas and add or detail details of an idea, object or situation so that it becomes more interesting. This is because students are too focused on solving the questions, so they pay less attention to the meaning of the questions.

It can be concluded that the lowest creative thinking ability in the experimental class lies in the 1st indicator of originality, which was obtained with a score of 77.14, meaning that some students did not come up with unique ideas, and the highest indicator in the experimental class was the 3rd indicator of flexibility of thinking (flexibility) with a score of 89.29. Meanwhile, the control class is in the 4th indicator with a score of 58.33, and the highest indicator is the 2nd indicator with a score of 77.14.

For the results of the mathematical problem-solving test given by the researcher, it was found that:

1. The results of students' creative thinking abilities in the control and experimental classes, through giving a posttest, show that students have been in a good category in solving the questions given according to the indicators of creative thinking. This increase was due to increased student confidence in conveying their ideas; students concentrated more on participating in science learning.
2. After the learning process in each class, the ability to think creatively in the experimental class was higher than the ability to think creatively in the control class.

Meanwhile, for the results of the independent sample t-test with a significant value of $0.003 < \alpha$ ($\alpha = 0.05$) and $t \text{ count} > t \text{ table}$ or $= 3.226 > 1.684$, then reject H_0 and accept H_a . Thus, statistical analysis proves that using the project-based learning model is effective in the creative thinking abilities of fifth-grade elementary school students. The project-

based learning model is defined as a learning model that involves students trying to solve problems by going through several stages of the scientific method so that students are expected to learn knowledge related to the problem. At the same time, students are expected to have problem-solving skills that will create a creative thinking process. Student. In addition, by using this model, the learning stages mature students in groups to find solutions to problems in science lessons. So, that creates a sense of curiosity in students to solve existing problems. Therefore, this can give students self-confidence because students can see their abilities to solve or find solutions to existing problems.

The effectiveness of the project-based learning model has been proven by (Asni Widiastuti, 2020). Through project-based learning, students are seen to have and appreciate a sense of beauty, have a strong imagination, and have different ideas. Students are also active in completing projects independently, trying several applications to get good results, and trying to develop their ideas through a non-fiction explanation. Indirectly, students' creativity increases their learning activities.

This is in line with research conducted by (Elok Mualidyah, M.Thamrin Hidayat, Suharmono Kasiyun, Sri Hartatik, 2020) entitled The Influence of Project Based Learning Models on the Creative Thinking Ability of Class IV Elementary School Science, by using Project Based Learning becomes more planned, creative and emphasises learning that originates from real situations. Project Learning focuses on characteristics and principles that aim to ensure that students are actively involved in learning, managing assignments and study time, solving problems, integrating perfect learning, and producing a product or work based on the results of creative thinking. Furthermore, in an international journal by (Taty Rosiana Koroh, Andriyani Afliani Dua Lehan, Treesly YN Adoe, and Maxel Koro, 2022), the model encourages their direct involvement in the learning process. This model improves their ability to think and create new ideas that are different from existing ideas. In this way, this idea can be transformed into a creative product and increase their self-confidence.

CONCLUSION

Based on the results of hypothesis testing, it is proven that there is a conclusion that the use of the project-based learning model is effective on the creative thinking abilities of fifth-grade elementary school students. This can be seen from the Sig value. = 0.003 smaller than alpha (α) = 0.05; with a value of $t_{count} > t_{table}$ or $2,500 > 1,672$, then reject H_0 is rejected and H_a is accepted.

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PROPOSING 360-DEGREE FEEDBACK AS THE SOLUTION TO ISSUES SURROUNDING FEEDBACK IN THE PRIMARY CLASSROOM

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ABSTRACT

Feedback is widely acknowledged to be an important part of student learning. It supports the learning process by confirming or correcting what an individual has learnt, thus making the process more productive. Feedback is most effective when teachers can give personalised, descriptive feedback on pupils' work; yet, issues in the classroom, such as large classroom sizes and the lack of learner involvement in the feedback process, have severely limited the effectiveness of feedback. Through literature review, the current paper advocates the 360-degree feedback model as the solution to the issues surrounding feedback in the Malaysian primary classroom. Whilst not prominently utilised in the educational context, an integrative framework of 360-degree feedback for learning and assessment demonstrates how the model can address the limitations of feedback that have plagued its effectiveness in the classroom. The framework incorporates six primary elements (i.e., timing, quality, quantity, social pressure, reflection, and communication) to maximise the potential of feedback for learning. The article aims to highlight the potential of 360-degree feedback for learning and remedy the continuing absence of 360-degree feedback in the primary classroom, which is a huge loss to teachers and pupils. Further research is needed to thoroughly explore how the model can be assimilated into the practice of feedback in the ESL classroom.

Keywords: 360-degree feedback, ESL, feedback, issues, primary

INTRODUCTION

Feedback is one of the most impactful practices for inciting improvement from prior performances. Education plays a significant role in student learning and achievement (Lipnevich & Panadero, 2021). Hattie and Timperley (2007, p. 81) defined feedback as «information provided by an agent (e.g. teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding». More than just a tool to point out the rights and wrongs, proper implementation of feedback can facilitate improved performance and learning by providing key information regarding the learning objectives and outcomes (i.e., Where am I going?), the progress needed (i.e., What progress is being made towards the goal?), and the means to get there (i.e., What activities need to be taken to make better progress?) (Hattie & Timperley, 2007). The meta-analysis by Wisniewski et al. (2020) shows that feedback, regardless of form and type, positively affects student learning. Their findings add to substantial evidence corroborated by other meta-analyses investigating the effectiveness of feedback in various aspects of language learning (e.g., Kang & Han, 2015; Li, 2010).

However, there have also been studies that report contradictory outcomes. Price et al. (2011) highlighted the current feedback practice's problems, which cause learners disengagement. It was argued that certain aspects of feedback (e.g., exclusion of learner input into the feedback process, ambiguity of the comments) cause learners to perceive feedback negatively and disengage from the whole process. It resonates with Kluger and DeNisi's (1996) finding that in 1/3 of cases, feedback can have an adverse effect on learners' performance. Such findings contest the current guise of feedback as the perfect remedy for poor performances and signify that more research in that area is needed, with perhaps the injection of a fresh perspective to the feedback practice in the classroom.

FEEDBACK ISSUES

Assuming that teachers are well-equipped with all the necessary knowledge and skills to give feedback, external issues can still influence the effectiveness of feedback. Two factors often considered to inhibit effective feedback in the primary ESL classroom are the large classroom size and the lack of learner involvement in the feedback process. Similar issues can also be found in the Malaysian context. The challenge of a large class size, compounded by learners with different levels of English competency, makes it difficult for teachers to give them effective feedback in the classroom. Aside from having to allocate a lot of classroom time to address the individualised needs of each pupil, it is also mentally demanding for teachers to consider the pupils' varying English proficiency levels in their comments.

Furthermore, Malaysian schools have notoriously packed timetables (Gurnam et al., 2018). On top of a balancing act with numerous school subjects (Mohd Sallehudin & Nurul Farehah, 2017), teachers often find themselves in a race against time to finish the subject's syllabus due to school events and public holidays taking away even more precious contact hours with the pupils. Consequently, most teachers compromise by providing feedback to groups or the whole class, and their feedback is mostly to correct errors or to offer praise for satisfactory performance (Zuwati et al., 2018).

The next critical issue is that there is generally a lack of learner involvement in the feedback process. Gurnam Kaur et al. (2018) investigated the implementation of the CEFR-aligned School-Based Assessment (SBA) in the primary ESL classroom as a part of the initiative by the Malaysian Ministry of Education (MOE) to align the national curriculum to the international standard. It was discovered that ESL teachers still relied on mostly traditional means (e.g., homework assignments, worksheets, portfolios) to assess pupils formatively, while teacher feedback was far from constructive as it was not based on the performance standards of the revised ESL syllabus. Even more critically, peer assessment was hardly practised, and there was no evidence of self-assessment in the ESL classroom, despite both being essential components of the new curriculum. This phenomenon is common in Malaysian ESL classrooms (Sardareh, 2016). The absence of peer and self-assessment as sources of feedback from a different perspective represents a huge miss in implementing formative assessment.

TEACHER FEEDBACK, PEER FEEDBACK, AND SELF-FEEDBACK

Teacher feedback

Most feedback literature approaches the topic of feedback with teachers in the spotlight as feedback providers (Panadero & Lipnevich, 2022). They are a credible source of feedback as they are experts in the subject matter and have access to performance standards, making their feedback valid, reliable, and generally trustworthy (Leong et al., 2018). Teacher feedback is also often more analytic, which allows learners to obtain important information, such as how their work compares with learning goals and what they need to do next, which gives them a sense of control over the learning process that facilitates the improvement in their future work. Learning happens when learners focus on achieving learning goals, getting better at skills, and familiarising themselves with new schemata (Anne Malar et al., 2021), without which there can be no learning. The role of teacher feedback is to present learners with the means, motive, and opportunity for internal regulation of learning.

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getting better at skills, and familiarising themselves with new schemata (Anne Malar et al., 2021), without which there can be no learning. The role of teacher feedback is to present learners with the means, motive, and opportunity for internal regulation of learning.

Furthermore, teachers' evaluations might be affected by subjectivity and bias. Although they are experts in the classroom, no individual is immune to emotions, preferences, and biases. Lipnevich et al. (2016) stated that teachers' evaluation of pupils' work may be inaccurate due to the influence of positive or negative emotions. Moreover, there is the possibility of bias in teacher perceptions of pupils' performance (Campbell, 2015). Teachers' evaluation of their pupils' academic performance can be heavily affected by direct personal experience formed by daily interactions or first impressions. This can snowball into learners developing an adverse attitude to feedback and feeling demotivated from the feedback they receive (Anne Malar et al., 2021) as they feel the comments are unjust. It is backed by findings by Alla Baksh et al. (2016), whereby learners reported having doubts concerning teachers' subjective evaluation of their performance, which in turn led to them dismissing their scores in formative assessments being a fair representative of their real ability.

Peer feedback

Owing to a shift to a student-centred approach in learning, peer assessment has gained prominence in recent years, and for good reasons, too. According to Topping (2017), not only does peer feedback have a positive effect on academic performance, but its long-term benefits include "transferrable skills in communication and collaboration" as well as "self-regulation of [learner's] own learning" (p.3). Pupils develop critical thinking skills by analysing and evaluating their peer's performance (Didih et al., 2020; Ekahitanond, 2013; Rodriguez et al., 2022). Enabling pupils to be agents of feedback also encourages participation, cooperation, and involvement, which can lead to better motivation as it downplays the disparity of the teacher-learner dynamic and lets everyone come together in a collaborative process of learning (Tee & Pervaiz, 2014). Furthermore, as learners, pupils often have better insight into peer issues than teachers (Dochy et al., 1999, as cited in Tee & Pervaiz, 2014). Hence, they can offer a different angle than teachers when providing feedback. Also, peer feedback can be provided in a much larger quantity than teacher feedback within a shorter period.

The downside of peer assessment is that it may lack accuracy, depth or reliability (Topping, 2017). As learners are usually less familiar with performance standards and learning outcomes, peer feedback may not be as analytic and detailed as teacher feedback. In the case of young learners, there is also the added concern of their personal feelings affecting their judgment and, subsequently, their feedback. Also, not all learners share the same enthusiasm towards commenting on their classmates' performance or receiving negative feedback from their peers. When the provider and recipient are of similar status, the former might be reluctant to share their perspective for fear of being wrong or appearing unpleasant and harsh (Bryant & Carless, 2010, as cited in Leong et al., 2018). On the other hand, the recipient might be frustrated when receiving unfavourable comments, especially when perceived as unfair or biased.

Self-feedback

Last but not least, contemporary education has also raised the awareness of learners' autonomy in learning. Through self-evaluation, learners can think critically about their work to generate internal feedback and self-regulate their learning through goal-setting and self-monitoring (Andrade, 2019). Vasileiadou and Karadimitriou's (2021) study on the impact of self-assessment and feedback on primary school pupils' language performance indicated that self-assessment through the use of rubrics can provide informative feedback to help direct learners' attention to what is expected of them and quickly analyse the deficiencies in their performance. Panadero et al. (2017) also stated that self-assessment and feedback interventions promote learners' use of learning strategies and motivation. Their study shows that self-assessment and feedback have a positive effect on two important aspects of learning: 1) self-regulated learning, which is a significant predictor of academic performance

as it includes a large number of variables related to learning and 2) self-efficacy, which can be defined as the belief in one's capabilities to perform a task and achieved the target outcome.

Notwithstanding the positives, self-feedback relies highly on learner participation and understanding its main functions. Usually, studies involving young children report ineffective implementation of the procedure due to their shallow grasp of the concept (Andrade, 2019). Learners must be autonomous and proactive when evaluating themselves, either by developing their criteria or using an established rubric, which can be overwhelming for children who are yet to be independent learners. Without the calibration of external feedback or utilisation of reference information (i.e., performance standards), learners' internal feedback may lack accuracy and lead to under- or overestimation of their performance, which can further develop into a fallacy about their ability that is detrimental to their learning.

CORE ELEMENTS OF THE 360-DEGREE FEEDBACK

A dearth of studies is looking into implementing 360-degree feedback in the context of education for student learning. As with the application of 360-degree feedback in organisations and medicine, studies that investigate 360-degree feedback in education associate the model with leadership at the administrative level (e.g., principals, heads of departments) and teacher performance evaluation. However, literature has shown that 360-degree feedback can positively influence individuals' development. The model can contribute significantly to student learning, which is the main objective of education.

Tee and Pervaiz (2014) laid the foundation for integrating 360-degree feedback for learning and assessment by highlighting the model's core elements that correspond to teaching and learning. An effective system enables these elements to function intertwiningly to maximise the potential of feedback for learning; according to Tee and Pervaiz (2014), 360-degree feedback can adequately meet the requirements of effective feedback, which are timing, quality, quantity, social pressure, reflection, and communication (see Table 1 for elaborations on each element).

Table 1

Core elements of the 360-degree feedback framework and elaborations

Core element	Elaboration
Timing	Learners are less likely to find the feedback useful or act on it if there is a delay between the task and the feedback. The inclusion of learners as agents of the feedback process in 360-degree feedback takes away the burden of providing feedback from the teacher, allowing feedback to be given in a prompt and timely manner.
Quality	Teachers and learners are often in constant close contact as collaborative partners in the feedback process with 360-degree feedback. Enhanced quality in feedback via frequent communication and collaboration among teachers and learners ensures learner engagement and motivation in learning.
Quantity	It is easier for learners to act on feedback when it is provided in relatively small chunks and in regular intervals. The collaborative feature between teachers and learners that 360-degree feedback offers allows a delegation of focus on different aspects of learners' performance to different agents. This ensures that each feedback is provided in a concise manner with a specific focus.
Social pressure	Drawing on the social interdependence theory, learners develop a sense of responsibility for each other when being part of a group. Incorporating peer feedback injects a layer of social pressure, which can be directed towards a positive outlet that facilitates learner engagement and achievement of a mutual goal (i.e., improvement in learning).
Reflection	Meta-cognition is enhanced by encouraging awareness and reflection of the learning process. While self-assessments raise awareness of performance standards and learning outcomes, the synchronous use of peer assessment enriches the profundity of reflection.
Communication	Pupils and teachers are jointly involved in the process of dialogic and regular communication of feedback comments.

IMPLEMENTATION OF 360-DEGREE FEEDBACK IN THE MALAYSIAN ESL CLASSROOM

The latest reformation of English language education in Malaysia sees the preamble of the English Language Education Roadmap 2015-2025 as part of the Malaysia Education Blueprint 2013-2025 and the alignment of the present curriculum at primary education, the Standards-based English Language Curriculum (SBELC) to the Common European Framework of Reference (CEFR). The *modus operandi* of the CEFR-aligned English curriculum is to introduce English language skills (i.e., speaking, listening, reading, writing) across themes and topics that are relevant to the pupils' daily lives to familiarise them with the target language in a real-world context (Curriculum Development Division, 2011, as cited in Farah & Mahani, 2022). Moreover, the modular structure of the curriculum also offers repeated opportunities for pupils to better their mastery of language skills in various authentic situations.

SBELC reflects the MoE's policy to primary education in general, which is to adopt the student-centred approach to language learning (Farah & Mahani, 2022). Teachers act as facilitators to assist pupils actively involved in numerous classroom strategies and activities designed to enhance their communicative competence in English. On top of that, formative assessment is advocated in daily teaching and learning in which teachers provide regular feedback to pupils on their learning progress. The feedback from the assessment would also inform the teachers of their teaching and help them make decisions on their future lessons. Aside from sharing similar underlying principles of student-centredness, the integration of CEFR into the local curriculum "provides a systematic guide for the development of trained English language teachers, benchmarked syllabus items and teaching materials, internationally standardised assessments, and clearly defined language competency expectations and outcomes for all education levels" (Hazita, 2016, p.74). Additionally, the CEFR promotes learner-centeredness in line with its action-oriented approach, emphasising learners' communicative capacity.

The current article is built upon the premise that formative assessment and feedback are already advocated practice in the classroom and that 360-degree feedback can complement these practices in ESL classrooms without requiring a significant curriculum overhaul. The modular design already offers a suitable platform for developing language skills as pupils get to revise the four language skills (i.e., listening, speaking, reading, writing) in different contexts, allowing them to improve over time. For example, in the Year 6 English textbook *Academy Stars*, the writing task for the first unit is writing a newspaper article with the focus of the activity on including direct speech in their writing; in the next topic, the pupils have to write a diary entry while recognising features of informal writing (Elsworth & Rose, 2021). It is the same for other skills with grammar and key vocabulary embedded in the lessons. Hence, with opportunities to revisit the same skills repeatedly, offering maximum capacity for skill-based language learning, the onus is on how the most learning can be extracted from these opportunities.

Integrating 360-degree feedback into the existing feedback practice in the Malaysian ESL classroom is believed to address the issues surrounding feedback, thus enhancing the quality of feedback given to the pupils. The issues surrounding feedback are the large classroom size (Gurnam et al., 2018) and the lack of student involvement in the feedback process (Sardareh, 2016). In short, both are borne out of the dependence on teachers as the sole feedback provider. Although teacher feedback is essential, it is not without its deficiencies. Providing individualised and constructive feedback to a classroom of 30 to 40 pupils is impractical due to the time it would take and mentally taxing the teacher. The subjective nature of feedback can also easily allow for biases to creep in and influence how teachers perceive their pupils' performance.

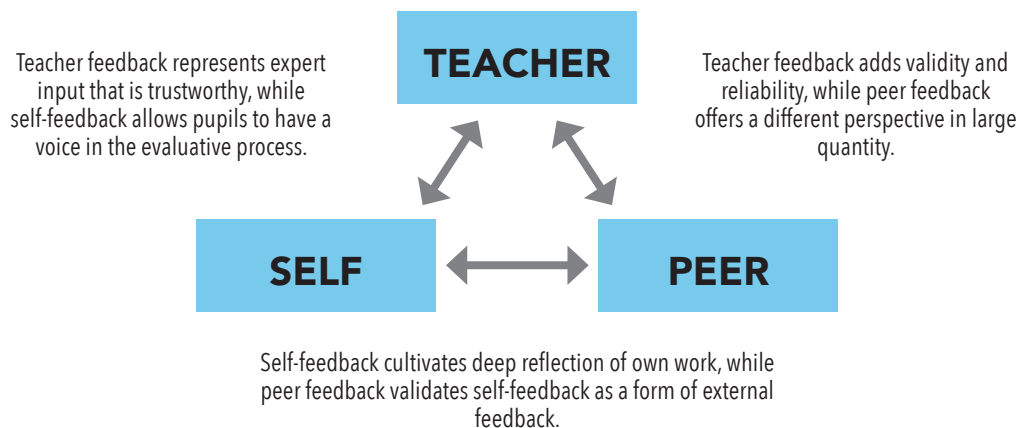
The inclusion of learners via peer feedback and self-feedback in 360-degree feedback can offset those deficiencies of teacher feedback. The former can support teacher feedback as it can be provided in a large quantity within a short period. Additionally, peer feedback offers a pupil's perspective of the performance that can reinforce teacher feedback or

give the recipients something else to think about. From a learning standpoint, entrusting learners with the responsibility to evaluate others' work encourages them to think critically and deeply before presenting their thoughts in an organised and logical manner (Rodriguez et al., 2022), which is essential to their development as a learner. The implementation of peer feedback, alongside teacher feedback, can bring different qualities to the table that complement each other perfectly (See Figure 1).

As for self-feedback, it encourages pupils to reflect on their performance as part of their learning. Through self-regulated learning, pupils become more aware of where they are and what should their next course of action be to improve through self-regulated learning (Hattie & Timperley, 2007; Topping, 2017). Instead of teachers being hands-on at every step, pupils drive their learning as they analyse their work, identify their weaknesses and devise methods to do better in the next task (Orsmond et al., 2002, as cited in Tee & Pervaiz, 2014). Besides self-regulation, involving pupils in evaluating themselves is also significantly effective as it develops and supports their self-confidence. When self-feedback is utilised in conjunction with teacher feedback, it makes the process of receiving comments less daunting as teachers and pupils are collaborating to solve a mutual problem, rather than in an I'm-fixing-you sense in a top-down, teacher-pupil relationship (See Figure 1). Pupils' perceptions are respected, and it can lead to them being engaged cognitively in the feedback process, especially when their views differ from their teachers'.

Figure 1

Implementation of 360-degree feedback to complement the different sources of feedback



CONCLUSION

Based on the literature on the subject matter, it is safe to assume that learning can only be more effective with proper feedback. The 360-degree feedback system is proposed as a holistic approach that engages the stakeholders in the ESL classroom context (i.e., teachers and pupils) and fully utilises them to maximise the effectiveness of feedback. Teacher, peer, and self-feedback are incorporated within a sustainable system where they offset the shortcomings of the different sources (i.e., teacher, peer, self) when implemented independently and enhance the efficiency of feedback in the classroom (Tee & Pervaiz, 2014).

To summarise, 360-degree feedback can adequately address the critical aspects that enhance the effectiveness of feedback, such as timing, quality, and quantity (Brookhart, 2017). With pupils shouldering part of the responsibility as feedback agents, it ensures that feedback can be provided at regular intervals and promptly without compromising quality. Moreover, it promotes congeniality and collegiality (Tee & Pervaiz, 2014). Pupils are given a voice in the classroom to communicate meaningfully with the teacher and each other. They can support each other with helpful comments as they navigate the intricate web of language learning. In addition, the increased awareness of key aspects of language learning also enriches their reflection and makes them more self-conscious of their progress as a learner. Through timely, prompt, and regular feedback combined with

quality engagement and quantity of feedback that facilitates meaningful communication, positive social pressure, and self-reflection, 360-degree feedback will be an important ally to teachers and pupils in the ESL classroom.

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AWARENESS AND READINESS ON QUANTUM COMMUNICATION TECHNOLOGY AMONG THE REGULATORS, INDUSTRY PLAYERS, AND ACADEMICIANS IN MALAYSIA

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ABSTRACT

The Quantum Communication Technology (QCT) industry is growing aggressively at the global level, but the existence of this technology is not yet clear in Malaysia. This study reviews the awareness and readiness among regulators, industry players, and academia on the development of QCT in Malaysia. This study conducted a focus group discussion involving twelve experts representing regulators, industry players, and academicians who have extensive background and knowledge in cybersecurity. This study found that most of the participants have a basic understanding of the QCT, and they are also aware of QCT development. The participants also perceived that QCT could be a better solution to information technology cybersecurity breaches. However, it depends on the context/complexity of the security breach and the level of data. Based on the participants' responses, QCT has not yet been implemented in Malaysia in the communication sectors. Therefore, this technology has already been used in developing countries such as China, Japan, and the United States. It shows these developing countries dominate in advanced communication technology while their cyberspace is well protected with QCT. Hence, findings from this study will be able to highlight the importance of awareness and readiness for QCT, which later boosts the QCT development in Malaysia and enriches the body of knowledge in the QCT field.

Keywords: Quantum Communications Technology, Understanding, Awareness, Regulators, Academicians, and Industry players

INTRODUCTION

Quantum communication technology (QCT) is an emerging field that has the potential to revolutionize the way we communicate and transmit information. Japan has been involved in this technology over the past 30 years. The main funding agencies for these projects include the Japan Science and Technology Agency (JST), the National Institute of Information and Communications Technology (NICT), the Japan Society for the Promotion of Science (JSPS), and the Cabinet Office of the Government of Japan (Yamamoto et al., 2019). QCT utilizes the principles of quantum mechanics to enable secure and efficient transmission of data (Giles, 2019). Quantum technologies offer possibilities for enhancing telecommunications systems, which can improve encryption methods and enable the secure transmission of data (Krause, 2022; Martin et al., 2021).

There are various telecommunication operators in Malaysia, such as Digi Telecommunications, Maxis, and Celcom (Malaysia - Information & Communications Technology, 2022). The regulatory body that is in charge of overseeing is overseen by The Malaysian Communications and Multimedia Commission (MCMC). However, Malaysian telecommunication operators

could not avoid facing data breach issues. For instance, in 2022, Telekom Malaysia (TM) reported a data breach that affected 250,248 customers of their Unifi Mobile service. The breach occurred on December 28 and involved customer names, phone numbers, and emails (NST Business, 2022). This event shows that Malaysia has technology and mechanisms to protect matters related to cybersecurity, but there are new (and more) advanced technologies that may hack communication systems. QCT is said to be one of the prominent tools to increase the cybersecurity pace as it comes to which more powerful technology could highly secure communication channels, making it useful for safeguarding sensitive information during data transfer (Krause, 2022; Martin et al., 2021). The most recent developments in QCT research for many developing nations include electronic marketplaces, semiconductor testing, energy storage, the internet, and many other areas in nations like the US, UK, Korea, Canada, and China (Singh et al., 2020). While several quantum cryptography initiatives are being carried out in these nations to provide secure information transmission to the high-technology sector, QCT development in Malaysia is still unclear. However, there is one (1) QCT project that has been developed individually at a mini scale in Malaysia, while not at the industry level nor a big scale (Mustafa, 2017).

From the literature, this study found there is a lack of information and academic work on QCT development in Malaysia, even in other countries. Therefore, these raised questions are as follows: (1) What is the awareness of QCT among the industry players and academicians? (2) What are the perceptions of industry players and academia regarding readiness to implement QCT in Malaysia? In addressing this question, we conduct focus group discussions (FGD) with Malaysian telecommunication sector players, specifically in the cybersecurity department and academicians. To achieve the objective of the study, we adopted the qualitative methodology.

The study aims to determine the awareness and readiness among industry players about Quantum Communication Technology. The need to identify the awareness and readiness among industry players is relevant since they have direct exposure in the communication technologies scenario, thus more alert on related new technology, opportunities, threats, and other related matters. For these reasons, this study believes they have capabilities and influence as the main players who will get involved with the QCT development in Malaysia.

The rest of this paper is structured as follows: problem statement, literature review, methodology, result, and lastly, conclusion. Moreover, the contribution of the study will emerge. It will be presented according to research questions, the theory that underpinned and constructed the study, as well as findings that answer the research questions.

PROBLEM STATEMENT

Today, we can observe that there have been numerous cyber platform data breach occurrences, where a data breach is an unfortunate occurrence in which unauthorized parties steal information without the owner of the system's knowledge or consent (Froehlich, 2022). Data loss could result in financial loss for the owner when important data is stolen, including personal information like client data, bank passwords, and so forth (Eiza et al., 2021). Data protection is a key factor in moving the country toward being digitally enabled because of the increased dependence on technology and all the risks, opportunities, and rewards accompanying it (Setiawati et al., 2020). In 2022, data breaches involving banking institutions, multimedia and broadcast organizations, and a government electoral agency affected Malaysians. Millions of people's data were allegedly sold online in these incidents (Loheswar, 2022).

Some cases include one leaking information regarding roughly thirteen million bank accounts belonging to Malaysia's largest lender, Maybank. The stolen data has been posted on a well-known database marketplace where the seller requests that potential buyers send them directly over Telegram or make use of the forum's direct messaging features to complete the transaction. Lowyat.net noted that there was also a separate listing on the

same day that the seller claimed to have a personal database of Unifi's mobile users. The seller asked for US\$850 and RM3,752 for the transaction (Loheswar, 2022).

Individuals may suffer from data breaches in various ways, including financial loss, identity theft, invasion of privacy, targeted scams and phishing attacks, reputational harm, and psychological effects, not just in Malaysia but across the globe (Wang & Wang, 2022). To limit the effects of data breaches and prevent further events, people and organizations must make proactive efforts, such as implementing robust security measures, updating software and systems regularly, practising good cybersecurity hygiene, and being alert to potential dangers (Vishwanath et al., 2020).

Therefore, this is where Quantum Communication Technology (QCT) comes in, which has been claimed to be a better/more powerful tool for secured communications (Krause, 2022; Martin et al., 2021). Quantum computing is gaining traction in the region, and a larger pool of quantum engineers is also being developed in the region, with higher education institutions in Malaysia, Singapore, Vietnam, and Indonesia taking action to expand their courses on the topic (Raj, 2021). Nevertheless, Quantum Communication Simulator (QuCS), a program created by Associate Professor Dr. Zuriati Ahmad Zukarnain, a lecturer at the Department of Communication Technology and Networking, Faculty of Computer Science at Universiti Putra Malaysia (UPM), aims to help researchers simulate and model virtual quantum experiments (Mustafa, 2017). However, there is a lack of studies related specifically to the awareness and readiness of QCT among industry players and academia; further research or specific studies that focus on the awareness and readiness of QCT in Malaysia might provide further insight.

OBJECTIVE OF THE STUDY

To review the understanding of QCT among the regulators, industry players, and academicians

To explore the readiness of regulators, industry players, and academicians regarding the development of QCT

LITERATURE REVIEW

Quantum Communication Technology

The idea behind quantum communication technology is that qubits (quantum bits) can be sent between distant locations using photons, which is a promising use in optical fibres; photons can travel with little attenuation and are effectively separated from disturbances, enabling long-lived superposition states (Goldner et al., 2015). Quantum communication allows quantum computers to link to one another to create a quantum network, increasing computing capacity and offering high data transfer security, particularly in quantum cryptography (Goldner et al., 2015).

New research and development areas, such as quantum communications, have emerged because of the discovery of quantum mechanics. The mystery of the quantum universe captivated physicists, mathematicians, and computer scientists, inspiring the creation of quantum nonlocality and communication protocols (Rastogi et al., 2021). Developing viable technologies that meet the strict requirements of low noise and high coherence for quantum state encoding, high bit rate and low power for the integration with classical communication networks, and scalable and low-cost production for a realistic wide deployment is also a challenge to take into consideration (Paraíso et al., 2021).

One of the main factors driving the current active development of QCT is the growing demand for secure communications, in which the demand for secure communication

becomes increasingly important as the number of connected devices and the volume of data increase (Bobier et al., 2023). A secure method of creating symmetric encryption keys is provided by quantum key distribution (QKD), one of the fundamental protocols in quantum communication., whose security level may be calculated using information theory. Over the past two decades, QKD has developed at an ever-increasing rate, and the most recent years have been characterised by spectacular achievements demonstrating the technology's maturity (Paraíso et al., 2021).

(QCT) contribute to the growth of technology. The application of quantum bits in communication technology has already outperformed the capabilities of current technologies and shown us a new direction in advancing technical fields (Hasan et al., 2023). A recent study discusses the application of quantum computation and communication to 6G networks, mentioning that scientists must create quantum-resistant gear and encryption techniques to deliver 6G to the public (Ali et al., 2023). Developing efficient and effective supply chains and coordinating standardisation activities are becoming increasingly important in standardising quantum communication (QKD). Most of the involved standards-developing organisations are trying to cover the entire field of QKD standardisation without paying much attention to the activities (van Deventer et al., 2022).

Aside from that, governments and companies worldwide have invested in the development of quantum communication because they understand how important it is for security. Initiatives like the CHIPS (Creating Helpful Incentives to Produce Semiconductors) and SCIENCE Act. Act in the United States and China's commitment to quantum technology, which includes networks of quantum dots, shows the strategic importance of quantum communications (Bobier et al., 2023).

Development of Quantum Communication Technology

There are several well-established international efforts in quantum research and technology, and they are expanding quickly. For instance, Canada, a global leader in the QCT, has invested over \$1 billion in quantum research over the last ten years; as a result, Canada has a rising effect in the commercial sector, world-class research capabilities, and significant government investments in innovation and brings Canadian in a great position to create quantum technology (Sussman et al., 2019).

Japan has been actively engaged in national quantum information research and technology projects for the past 30 years. The National Institute of Information and Communications Technology (NICT), the Japan Society for the Promotion of Science (JSPS), the Japan Science and Technology Agency (JST), and the Cabinet Office of the Government of Japan are the primary funding organizations for these initiatives. In the past 15 years, these authorities have invested US\$250 million in quantum information science and technology and industry investments. The development of prototypes such as coherent Ising machines and quantum key distribution systems, as well as the opening of new research frontiers, have been made possible by this financing. Japan recently unveiled new measures to promote the study of quantum information (Yamamoto et al., 2019).

Russia is also seen as dominating in QCT development and research works. Quantum technologies range from sensing to quantum communications to quantum computation and simulation. Russia has made significant advances in the field of quantum research, including in the fields of semiconductor technology, lasers, and low-temperature physics. In addition to two National Technological Initiative (NTI) facilities devoted to quantum technology, Russia has developed research organizations, including the Russian Quantum Center and the Kazan Quantum Center. Both public and private funds are used to support these facilities. Additionally, programs like Megagrants, which encourage foreign academics to work with Russian universities, provide funding for quantum research in Russia (Fedorov et al., 2019).

Through literature, the most recent worldwide study trends in the QCT area, including electronic markets, semiconductor testing, energy storage, internet, and the US, UK, Korea, Canada, and China, were found as leaders in the research work (Singh et al., 2020).

These nations are implementing various quantum cryptography projects that offer secure information communication to the high-technology sector (Singh et al., 2020).

METHODOLOGY

A qualitative research approach was adopted to determine the optimum research design for this study. Focus group discussion was utilized to gather data because this method enables the respondents to express their opinions in words and brainstorm the answers by discussion (Prasad, 2017). A physical face-to-face focus group discussion was conducted to collect the data. Many qualitative action research projects start with in-depth participant interviews as part of the planning phase, and frequently, the investigations are concluded with individual or focus group interviews reflecting on the process (Merriam & Tisdell, 2016).

This research reviewed reviews of the awareness and readiness for developing QCT in Malaysia amongst regulators, cybersecurity industry players, and academia. Hence, 12 participants from regulators, industry players, and academia joined the FGD. These participants are selected due to their positions in communication technology, particularly in cybersecurity (academic and practice), which hopes to provide input in answering research questions. The major aim of the focus group discussion is to comprehend the respondent's viewpoint, ideas and experiences on the topic that has been raised.

Instrument

In qualitative research, subjectivity and interactivity are assumed, and the researcher is the main tool for data collection. The interdependence of the observer and the observed may lead to behavioural changes in both parties. Therefore, the question is not whether observation influences what is observed but how the researcher can recognize and account for these effects when interpreting the data (Merriam & Tisdell, 2016). Therefore, the focus group discussion was guided by a thematic structured interview question themed as follows:

Table 1

Thematic structured interview question

No.	Theme	Details
Q1	Awareness of QCT	To study the awareness and evaluate the depth of respondent's understanding.
Q2	Security Breaches	To study the respondents regarding the data breaches and QCT roles in becoming the solutions.
Q3	Issues and Challenges	To explore the internal and external threats in implementing QCT
Q4	Telecommunication Sector	To identify the readiness to implement QCT
Q5	Recommendations to adopt QCT	To get respondent's recommendations for QCT

Sample

The respondents in this study were recruited through purposeful sampling wherein the researcher identified and selected the potential individuals with the information, experience, or viewpoints pertinent to the research topic. This study sent an invitation letter to approach the potential respondents to join the FGD. This approach enables the choice of volunteers who can offer detailed and insightful information consistent with the study's goals. Ensuring that the sample reflects the intended attributes or characteristics of the population being studied is made possible by purposeful sampling (Nikolopoulou, 2022).

Moreover, this study will also employ the selection of samples by criterion-based selection, as well as implementing it by theoretical sampling. Respondents from academia, regulators, and industry players have diverse backgrounds. The regulators, academicians and industry players were included in the discussion to identify the awareness and explore their opinion

on Malaysia's readiness to implement QCT. Besides, regulators in the government sector were also included because they play important roles in providing support regarding QCT development, especially regarding funds and infrastructures. The respondents are as follows:

Table 2

List of Respondents

No.	Company's name	Position	Number of respondents
1.	Public University	Academia	3
2.	Government sector	Regulator	4
3.	Cyber-security specialist agency and technology company	Industry player	3
4.	Malaysian telecommunication company	Industry player	2

RESULTS AND DISCUSSION

Data from the focus group were analyzed using thematic analysis and discussed accordingly. The study topics address the regulators, industry players, and academic understanding of QCT and their readiness to implement the technology.

Focus Group Discussion Sections

The focus group discussion has been conducted, which consists of twelve (12) participants, one (1) moderator and two (2) rapporteurs. The discussion was recorded and transcribed by the researchers. There were also written answers from the respondents during the focus group discussion that were collected at the end of the session. There are seven (5) main questions: the first question assessed the awareness of QCT among participants, the second question regarding security breaches, the third question regarding issues and challenges, the fourth regarding the telecommunication sector, and lastly, the respondent's recommendations to develop QCT. The first, second, and third main questions assess the respondent's awareness of QCT. The fourth and sixth questions assess the respondent's views regarding the industry players' readiness to implement QCT.

Awareness of QCT and its development in Malaysia

According to the participants' responses, out of 12 said they had previously heard about QCT. Additionally, one of the eight participants emphasized that people from a security background will be familiar with this technology. R10 said he heard about Quantum Technology but never heard specifically about QCT. The remaining did not answer the question. Accordingly, this study concludes that most of the participants are aware of QCT.

The respondents also can well-explained about QCT, which 8 out of 12 participants can elaborate on QCT. Seven of the respondents: R4, R8, and R10 alluded to this notion:

"QCT has different backgrounds, starting from engineering, physics, and IT. The intention of QCT is because of the breach of the factorial function that the algorithm shows ..." (R1)

"Communication technology that involves/uses quantum version/mechanics (globally)..." (R2)

"There are two issues in data security, data in motion, and data address. Quantum network focusing on in motion data. We are a man in the middle, sniffing traffic between point A to point B on the network. Quantum

entanglement can detect if there is anybody in the middle. Intercept the communication..." (R3)

"... So, the key we will look at is a quantum algorithm, one quantum key is physics, and the other is a quantum algorithm. use the quantum concept..." (R4)

"Communication using Quantum technology to transport single photons as early research" (R6) "...it is about un-hackable communication" (R9)

"QCT is a communication technology using quantum technology, including quantum algorithms and protocols." (R10)

Despite this, only 4 participants admitted they were aware of the development of QCT in Malaysia, and one participant was aware of the development at the international level but not in Malaysia. The remaining participants either answered "no" or did not answer the question. Three of the respondents: R4, R8, and R10 alluded to this notion:

"Yes, but not detail. Not really aware of the recent development in Malaysia..." (R4) "In Malaysia, yes but partially ..." (R8)

"If QKD is part of QCT, then I have been aware since 2009..." (R10)

Security breaches

During the discussion, regulators, industry players, and academicians acknowledge the risk of breaking the code. Most respondents said security breaches could happen in the organization because of people, specifically in individual faulty, lack of security awareness, low-security technology, and misconduct human error. There are also mentions that phishing and hacking can cause security breaches. Three of the respondents: R2, R4, and R9 alluded to this notion:

"Individual faulty and misconduct, human error." (R2)

"...People. lack of security awareness and low-security technology to protect parameter security." (R4)

"...But every year we actually pay hackers to come and hack us. We do. It is part of our risk assessment every year, and every year without fail a staff of 25, but for 14 years, there are still people who forget, you know, people. The human part is hard..." (R9)

In addition, the respondents also suggest some common practices if the breaches happen, such as revoking the RSA (Rivest–Shamir–Adleman) key, needing a proper incident response team, studying the problem, and fixing it accordingly and updating the company policy and procedures. One of the respondents, R4, alluded to this notion:

"Perform RCA (Root Cause Analysis) and fix the issues. Back to people, processes, and technology. Improve everything..." (R4)

The respondents acknowledged that QCT is not a solution to the breaching issue. QCT can solve high-level or advanced data such as national security, bank information, etc. Four of the respondents: R1, R2, R4, R8 alluded to this notion:

"...quantum is not coming to replace everything. We have to maintain everything, and the only thing is the sub of the part that is not secured that has to change..." (R1)

"...quantum computer is not replacing the classical computer. The classical will still exist, simultaneously..." (R2)

"...QCT can be a solution to parameter security but not solve the human factor for breaches." (R4)

"...There is no single recipe for a solution. We need to do a cost or risk-benefit analysis to find the solution. So, it depends on the situation..." (R8)

In addition, all industry players agree that the issue of data security is important because, during the discussion, 8 out of 12 respondents suggested that the company undertake an IT risk assessment. However, they have different ideas about the frequency of IT risk assessments. Some are suggested monthly, and others are suggested annually. Five respondents also suggested that a company should have a Chief IT risk Officer to handle the risk. There are also suggestions for good governance, security policies, an awareness program, and access control for the company to monitor security breaches to avoid reoccurrence.

Issues and challenges regarding the QCT

The external threats are classified into 3 factors: economic, technological advancement, the current standard industrial practice, and legal and regulatory requirements. For the economic factor, there are concerns about the amount of investment by the government as the cost of implementation is expensive to make it available for everyone, what more for the small companies depending on their return on investment (ROI) to continue in the market. One of the respondents also said that it is important for the government and private organizations to do a cost-benefit analysis. Moreover, cost and budgeting would be one of the challenges for implementing QCT in an organization. Three of the respondents: R1, R3, R9 alluded to this notion:

"...The obstacle is actually the money." (R1)

"It is going to be very expensive to make it available to everyone" (R3)

".... But again, at the end of the day as a private organization, the cost-benefit analysis is very important." (R9)

For the technology advancement factor, technology advancements can lead to data breaches due to several interconnected reasons, such as increased connectivity and digitisation. As technology grows, more devices and systems become interconnected, creating a vast data exchange network. Thus, as technology evolves, so do cyberattacks, in which hackers will continuously develop new techniques, tools, and strategies to bypass security measures and breach data. In other words, hackers will use software, hardware, and network infrastructure vulnerabilities to infiltrate systems and steal valuable data (Farrelly, 2023). One of the respondents alluded to this notion:

"These data breaches are super easy now. We must come out with whatever way of securing it... Israeli spy makes it very easy; they install spyware on your phone to intervene. They basically tell the information where the encryption is already passed. Decrypt it from your body. That is the easiest way to do it basically." (R3)

For the third factor, the current standard industrial practice, one of the respondents said that the current standard industrial practice is very low, and the price depends on what the organization wants to protect. Therefore, the remaining respondents did not give any feedback regarding this factor. One of the respondents, R3, alluded to this notion:

"The price depends on what you want to protect. The central bank has a lot of resources and money so it can hire a lot of people which is very good, but

other companies have to rely on profitability. The government has to give the budget because it is part of the economy..." (R3)

Nevertheless, enforcement from the government is necessary because if it does not enforce it, none of the agencies will act. After all, all companies are waiting for the government to inject some money. Four of the respondents: R1, R4, R5, R9 alluded to this notion:

"If the government does not push things, nobody will because the agencies or all companies are waiting for the government to inject some money..." (R1)

"We are not investing unless there is a specific requirement from regulatory..." (R4)

"...if this regulation does not exist, it will be difficult to implement because it cannot be validated." (R5)

"If the policy is from the top, everybody in certain industries must follow it..." (R9)

As for internal traits, the participant mentioned that top management commitment and acceptance of new technology are internal challenges. For the top management commitment issue, one of the respondents mentioned that if the top management does not see the importance of investing in QCT, it will not proceed. Other respondents also add that looking from the bottom-up will be difficult. However, if it is top-down, it will be easier. Therefore, one of the respondents mentioned that any technology that offers better security can be accepted by the cybersecurity team, which aligns with technological evolvments.

The readiness of industry players with QCT

The readiness of industry players is discussed accordingly by one (1) sector, the telecommunication sector.

Telecommunication Sector

One participant mentioned that the telco sector's motivation to invest in QCT is driven by the security value, which is crucial if communication is categorized as secret and top secret. Therefore, the motivation will also be to fulfil the demand for secure communication. Two of the respondents: R1, R4 alluded to this notion:

"Not valuable unless politicians like top management..." (R1)

"To provide secure communication to certain highly confidential groups (demand from users) ... " (R4)

Additionally, it is mentioned that it is not easy to invest because the private sector or even the government will consider revenue, which is how they value the business, especially in the telco industry. Other respondents added that it is not viable for the internal team unless it comes from a regulatory requirement. Hence, the industry players acknowledge that it is quite pricey to invest in QCT adoption. One of the respondents, R4, alluded to this notion:

"Not ready to fully fledge. But consider exploring a pilot project to adopt QCT..." (R4)

Regarding QCT integration with other systems and processes, participant R3 mentioned that the policy should create a special niche that the user uses because the public will not use it immediately or directly. However, they want more secure and reliable communication with their banking and asset information. Other respondents added that the QCT integration with other systems and processes depends on the manufacturing capability to integrate

QCT technology into existing infrastructure, and there is no problem in the telco industry as the communications between peers are already secured because every communication, end-to-end communication, is encrypted.

Additionally, two (2) participants also suggested needing specific training and upgrading the skills needed to operate and maintain the QCT.

Seven participants suggested a need to benchmark multiple countries, for example, Europe, China, and the US, instead of one country for QCT adoption in Malaysia, whereas every country's approach is different. Some countries approach QCT through the initiative of R&D starting from research; meanwhile, some other countries are based on the initiative of the policy itself. Other respondents then added that the European Union is the best for benchmarking because Europe came out with the initiative for all the countries, using money from the EU, and it creates competition moving to another platform as the industry-to-consumer drives it. The industry can benefit, and the government will benefit from it, and the country's technology development will progress well. In addition, some respondents also emphasise the R & D technologies project performed by the US, UK, and Germany to be referred for QT adoption in Malaysia. Three respondents, R1, R7, and R8, alluded to this notion:

"Every country's approach is different; some are through the initiative of R&D starting from the research..." (R1)

"Yes benchmark, R&D within universities or government even industry. See US, UK, and German." (R7)

"We Need to follow / benchmark multiple countries instead of 1" (R8)

Recommendations to adopt QCT

To summarize the Focus Group Discussion recommendations, the respondents mostly said it is a must to enhance education. Moreover, the government should also play its role in integrating with the existing infrastructure, conducting a pilot project, creating policies that have a direction that could lead the industry, collaborating with countries who are developing QCT, putting QCT implementation in regulatory requirements and pumping some budgets because QCT requires a big budget. Therefore, the respondents also suggested creating awareness among societies, especially at the degree level, through talks, forums, training, accelerator programs, and funding.

CONCLUSION

Based on the findings, most respondents are aware of QCT development globally; however, only a few are aware of QCT development in Malaysia. Result Q2 indicates that most respondents said security breaches could happen in the organization because of people, specifically individual faulty, lack of security awareness, low-security technology, and misconduct human error. Thus, the respondents acknowledged that QCT is not a solution to the breaching issue. However, QCT can solve high-level or advanced data such as national security, bank information, etc. Moreover, result Q3 mentions that the government should provide investment in the implementation cost to make QCT available for everyone.

Additionally, as technology evolves, cyberattacks, in which hackers will continuously develop new techniques to breach data. Besides, the current industrial practice in Malaysia is very low, and the price depends on what the organization wants to protect. Thus, the respondents acknowledge that enforcement from the government is a must because the industry players will play their roles based on what is supported by the government and money injection. Regarding the readiness of the telecommunication sector, as in Q4, the respondents mentioned that the motivation for implementing QCT depends on the data

value. However, the company's revenue will be considered before the implementation. The respondents also suggested a need to benchmark multiple countries in QCT adoption.

In contrast, every country's approach is different, and the benchmark will help in check and balance. Lastly, for Q5, most respondents suggested enhancing education regarding QCT. Moreover, the government should play its role in the existing infrastructure and creating awareness among societies about QCT is also a must, such as through forums, training, etc. The result of this study provides insight into Malaysia's awareness and readiness for the development of QCT in the country and deposited valuable input in QCT literature.

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SMARTPHONE USE PATTERN OF COLLEGE STUDENTS IN RELATION TO GENDER, RESIDENTIAL LOCALITY, AND ACADEMIC STREAM

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ABSTRACT

The present study aims to describe and explain the smartphone use pattern of college students in relation to their gender, residential locality, and academic stream. Primary data about smartphone time used for five broad purposes were collected from 180 college students of Odisha, India by the 'Stay Free' application software. Results show that college students use smartphones on average for 4 hours and 34 minutes per day and the highest time is spent for entertainment purpose and the lowest time for e-commerce irrespective of their demography. Residential locality has a significant effect on time spent on social media and entertainment; gender on time spent on entertainment and academic stream on both social media and voice call. The effect of these predictors on smartphone use patterns has been explained from a value system and academic perspectives. The results of this study will be helpful for educational policy framers for re-directing and modelling smart phones use behaviour of college students for better academic outcomes by initiating intervention measures.

Keywords: Smartphone usage time, college students, purpose of smart phone use

INTRODUCTION

The number of smartphone users and the amount of smartphone use time has recently increased globally. In specific reference to college students, it is found that 76% of college students from the USA use smartphones for an average of 3.5 hours per day (Smith, 2015). This time, smartphone use has been termed smartphone addiction, which adversely affects college students' physical, mental health and academic achievement. However, recent literature claims that smartphone addiction and its negative effects should be scientifically studied from the purpose of use rather than merely from the high time duration of use only (King et al., 2018).

How long one uses a smartphone is strongly related to the purpose he or she is using. Purpose-wise, smartphone use pattern depends upon primarily internal and external factors. Literature is enriched with findings that smartphone addiction or high time duration of use is positively related with individual's psychological attributes like perceived loneliness (Darcin et al., 2016; Aktürk et al., 2018), neuroticism, introversion, anxiety and low conscientiousness (Elhai et al., 2019; Peterka-Bonetta et al., 2019) and smartphone addiction is positively contributed by their use time for social medial, watching YouTube, making voice call (Song et al., 2004; Van Deursen et al., 2015). On the other hand, though the influence of external-environmental factors where the individual lives on behaviour has been theoretically claimed (Bronfenbrenner, 1979) and empirically accorded due to the complex and contextual nature of the influence of these external variables, it needs further explanations. This study aims to describe and explain college students' purpose-wise smartphone use patterns concerning their gender, residential locality, and academic streams.

Theoretical Background of the Study

The smartphone as an electronic gadget is brilliant as it has multiple application opportunities, but all individuals need to utilise smartphones in a uniform manner and time duration. Ideally, a phone has multiple academic application opportunities for college

students like attending online classes, sharing study materials or messages with friends and teachers, searching information from the internet for better clarification of doubts, using it for examinations and, in some cases appearing online examinations is desired and expected (Chee et al., 2017). However, reality shows that they use smartphones most of the time duration for connecting with others via social media like WhatsApp, Facebook, Messenger, and Instagram and doing or receiving voice calls (Van Deursen et al., 2015); internet browsing for getting news or information, gaming, watching or listing video and music, etc (Jeong et al., 2016; Salehan & Negahban, 2013). These smartphone use patterns are primarily social and individualistic, which is non-academic (Awasthi et al., 2020)

However, these non-academic purposes of smartphone use by college students are unique. Some findings suggest that college students smartphone use pattern in terms of purpose-wise spending is a voice call, social media, internet searching, and online shopping, respectively (Ataş & Çelik, 2019). Other researchers have reported on social media, entertainment, and gaming, respectively (Jeong et al., 2016; Salehan & Negahban, 2013). Cha and Seo (2018) have reported the most time college students to spend on a smartphone for messaging, followed by internet surfing, gaming, and social networks. In India, most University students use smartphones primarily to make voice calls, and some students use them to access social networking sites, Google searches and watching movies (Khan & Rahman, 2019).

Does this use pattern of college students vary due to their demography, like gender, residential locality, and academic subject they study? This is a concern of the researcher. Though attempts have been made globally to explain their association with smartphone use patterns, due to two reasons, this study was conducted. Firstly, no study was found on the specific effect of demographic variables like gender, residential locality, and academic stream on purpose-wise smartphone use time duration. Secondly, the findings are inconsistent and contextual. The explanations supporting the findings are also contextual as these demographic variables are part of a larger sociocultural context, which has its own way of influence (Van Bilijon & Kotze, 2008). This study aims to find college students' smartphone use patterns (use the time for social media, voice calls, information searching, entertainment, and e-commerce) concerning their gender, residential locality, and academic stream.

Gender and smartphone use pattern

Gender difference in smartphone addiction rate and use pattern has been studied globally. Genders as a social construct affect both the amount of smartphone use and the purpose of use. Some empirical findings support more smartphone addiction rate by college girls than boys (Igarashi et al., 2005; Andone et al., 2016; Shahrestanaki et al., 2020), but other findings support more time smartphone use by boys (Hassan & Hassan, 2016; Basu et al., 2018; Ghosh & Chatterjee, 2018; Awasthi et al., 2020; Chung, 2011). This inconsistency in differential addiction rates between boys and girls has differential explanations concerning gender-based socio-cultural context and the purpose of smartphone use.

Findings that support the high smartphone addiction rate by boys are primarily from India and other Asian countries; on the other hand, findings of high addition rate by girls are from western world countries. Awasthi and colleagues (2020) have claimed that this inconsistency in findings in terms of geographical context happens due to variation in gender differential socio-cultural context. In a country like India, adolescent boys get maximum freedom and autonomy to utilize their time as per their wish, on the other hand, some restrictions or norms are imposed on adolescent girls. This restriction versus freedom for girls and boys, respectively, leads to their controlled and uncontrolled smartphone use (Awasthi et al., 2020).

Similarly, a difference exists in the purpose of smartphone use between boys and girls. It has been found that girls use their smartphones more time for social media, contact, and communication (Andone et al., 2016), but boys use more time smartphone for individualistic purposes of use like internet browsing, downloading, playing games, watching online

videos and pornographic sites, listening music (Tsitsika et al., 2009; and one et al., 2016; Chen et al., 2017). The gender differential values system may explain this gender differential pattern of smartphone use. Girls value interpersonal and quick communication more (Park & Lee, 2012; Lee et al., 2016). High smartphone addiction in girls is predicted by their smartphone use time for social purposes and boys for individualistic purposes (Lopez-Fernandez et al., 2014). Nevertheless, when it comes to gender differential smartphone use rates for academic purposes, no difference is found (Hilao & Wichadi, 2017). Though this gender differential value preference has an explanation for the differential pattern of smartphone use between boys and girls, these values are not fixed; rather change due to the social change process like modernization, education, globalization which have their influence on gender socialisation practice, attitude and process (Hamidet al., 2015).

Residential Locality and Smart phone use pattern

Empirical findings about the association between residential locality and smartphone use patterns are limited to studies conducted in Asia and Middle Eastern countries only. It has been found that urban residents are more smartphone-addicted or use smartphones more often than rural (Kakkar et al., 2015; Patel & Rathod., 2011). Similar type of results have been found for smartphone use of rural versus urban college students, i.e., college students from urban localities are more smartphone-addicted than students from rural areas (Sowndarya & Pattar, 2018; Tapas, 2017; Kakkar et al., 2015; Patel & Rathod, 2011). Hamza et al. (2019) reported that 83.3% of students from the urban locality are internet-addicted, whereas 78% are from rural areas. However, as per the ASER report 2022, the number of households in rural areas of India with smartphones increased to 74.8% from 36% in 2018 (The New Indian Express, 21.01.2023). This difference in the locality-based differential rate of smartphone addiction by college students has been reported based on their residential locality, i.e., where they are from, not based on the locality of the college.

The reasons for the differential rate of smartphone addiction between rural and urban people are primarily structural. It has been found that good quality internet and phone signal, better economic conditions of urban residents to afford smartphone-related expenses versus poor internet signal quality, poor electricity conditions, and poor economic conditions of rural people are the reasons for their differential amount of smartphone use. These structural or infrastructural factors act as supportive for urban people and constraints for rural (Sylvester, 2016). Patel and Rathod (2011), in their study, found that comparatively less time duration of smartphone use by rural college students is due to economic reasons, i.e., 62.8% of rural students are spending less than 100 rupees per month for mobile recharge as their parents restrict their pocket money (Patel & Rathod, 2011). Similarly, the type of findings has been reported from the Jordanian context, but the reason is different. It was found that during the COVID-19 lockdown period, urban college students from Jordan University used smartphones more often than rural students due to strict surveillance and control imposed by the government in big cities and spending more time at home compared to rural areas (Saadeh et al., 2021).

This more or less time duration of smartphone use between urban versus rural residents is related to their purpose, which is influenced by their differential value preference. Rural People value physical inter-personal contact, communication, and relation, which may be the reason for less virtual contact via smartphone or physically spending time with people (Patel & Rathod, 2011). Smartphone addiction time duration is negatively related to the need for attachment with groups but positively related with individual or self-centred values or lifestyles (Wang, 2017). Manoj et al. (2020) have reported that Urban residents from Chennai, India use smartphone significantly more time than rural residents for the purpose of playing games (urban-50% versus rural-35%), listing music (urban-77.7% versus rural-54.5%), taking selfies (urban-48.5% versus rural-36.4%), internet surfacing (urban-77.7% versus 61.8%), WhatsApp (urban-77.7% versus rural-58.2%) and Facebook (urban-70% versus rural 40%). Fayaz (2011) has reported that students from rural India use smartphones more time for education than urban students for their specific purposes.

Academic streams and smartphone use pattern

Whether the time duration of smart use by college students is related to the nature of the subject they are studying is an exciting area of research literature. Though inconsistent findings have been reported, scientific explanation exists to support these, primarily based on the differential nature of academic subjects and the psychology of the students from respective academic disciplines. Some findings support that science or medical students are more smartphone-addicted or use smartphones more time (Saadeh et al., 2021) but other findings support more smartphone addiction in humanities and arts students (Albursan et al., 2019; Long et al., 2016; Abu-Jedy, 2008).

More time smartphone use by science students has been explained from an academic requirement perspective. The hardness of science subjects require frequent updates of knowledge and clarification of subject-related concepts, which is the reason for their high time smartphone use (Saadeh et al., 2021). 99.7% of medical science students view that using smartphones for social media like Facebook allows them to connect with the science and research world (Bich Diep et al., 2021). On the other hand, more time smartphone use by humanities or social science has been explained from psychological perspectives. Due to the poor psychological well-being of Arts or humanity students compared to science students, they use smartphones predominately for non-academic purposes (Kotar, 2013; Fard et al., 2014). Arts and humanities students have low-level problem-solving skills, which is why their high time smartphones are used for searching for study materials from the internet or seeking help from friends by sharing notes or texts (Williamson, 2011). It is a general tendency or practice to believe that comparatively high achievers opt for science subjects and low achievers for Arts or humanities subjects. So, the capacity to handle psychological stress is assumed to be more within science students than humanities, which may influence their differential amount of smartphone addiction behaviour.

From a learning strategy point of view, it has been documented that Arts students prefer group learning strategies where they use smartphones for sharing notes, voice calls, or WhatsApp chat with friends as a form of instrumental help device (Williamson, 2011). Though this differential amount of smartphone use between science and Arts or humanities students is assumed to be due to psycho-academic reasons (cognitive ability to handle stress and learning styles), but it must be further explored and explained.

Hypotheses of the Study

Based on the review of related literature, the following hypotheses have been formulated.

Boys will use smartphones more than girls in India (Hassan & Hassan, 2016; Basu et al., 2018; Ghosh & Chatterjee, 2018; Awasthi et al., 2020).

Students from urban localities will use smartphones more time than rural students (Sowndarya & Pattar, 2018; Tapas, 2017; Kakkar et al., 2015; Patel & Rathod, 2011; Hamza et al., 2019)

Arts and commerce students will spend more time duration of smartphone use than science students (Williamson, 2011; Kotar, 2013; Fard et al., 2014)

Participants

For the present study, researchers have used the descriptive survey method as the primary purpose was to determine the time duration of smartphone usage of college students for five purposes of smartphone use, i.e., information searching, social media, voice call, and entertainment.

Data are collected from 180 college students of the Bargarh district of Odisha by stratified purposive sampling technique, and the sample distribution is as follows. Apriori power analysis for MANOVA suggested that the required sample size is 173 to detect medium size effect ($d=.05$) with actual power 0.95, Pillai $V= 0.176$).

Table 1

Distribution of sample

Variable	Levels	N	Percentage
Gender	Boy	90	50%
	Girls	90	50%
Residential Locality	Rural	90	50%
	Urban	90	50%
Academic Stream	Arts	60	33.33%
	Science	60	33.33%
	Commerce	60	33.33%

Instrument and procedure of Data collection

Data about smartphone use time were collected by installing the 'Stay Free' App on the smartphone of selected samples, which is a responsive technique and gives more scientific results than self-reporting. This App was installed on the smartphone of selected samples with their prior permission. This App showed the Apps and total time duration of smartphone use for the last seven days. Then, the weekly data are converted to the day-wise duration of use. Though there are numerous apps in a smartphone, only time duration of smartphone use for five purposes is taken: i.e., information searching, which includes time spent for apps like Google Chrome, Mozilla Firefox, Bing, etc.; social media, which includes time spent for apps like Facebook, WhatsApp, Twitter; communication, which includes time spent for voice call and sending SMS; entertainment, which includes times spent for YouTube, Mzaalo, JIO TV, Music player; E-commerce, which includes time spent for online banking, Zomato, Ajo, Meso, Amazon, Flip cart.

Statistical Techniques

The collected data are analysed by descriptive statistics like mean and S.D. and inferential statistics MANOVA and Post-Hoc test.

Results

Table 2

Descriptive statistics for purpose wise time duration of smart phone use in relation to residential locality, gender, and academic streams

Demography	Information searching		social media		voice call		Entertainment		E-Commerce		Total used Time	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Residential Locality												
Rural (90)	0.17	0.17	1.00	0.42	1.11	0.48	1.45	1.1.1	0.3.05	0.3.38	4.16.03	1.38
Urban (90)	0.20	0.15	1.17	0.39	1.06	0.42	2.14	1.17.13	0.2.06	0.2.3	4.01.43	1.30
Gender												
Boys (90)	0.20	0.18	1.12	0.43	1.03	0.41	2.13	1.18.31	0.2.50	0.2.7	4.50	1.51
Girls (90)	0.19	0.15	1.05	0.39	1.13	0.48	1.47	1.0.15	0.2.23	0.3.1	4.24	1.28
Academic Stream												
Arts (60)	0.23	0.14	0.59	0.36	1.20	0.49	2.06	1.14.38	0.3.23	0.2.41	4.51	1.41
Science (60)	0.17	0.16	1.18	0.40	1.07	0.45	1.48	1.5.2	0.2.30	0.3.16	4.33.13	1.26
Commerce (60)	0.19	0.19	1.08	0.46	0.57	0.38	1.48	1.12.18	0.1.09	0.3.4	4.32.11	1.35
Total	0.19.55	0.16	1.8.56	0.42	1.8.11	0.45.28	1.59.9	1.11.6	0.2.36	0.2.9	4.34.53	1.41

*The raw data about smart phone use time was in second but reported by hour-minute-second format. The value before decimal indicates hour, value after first decimal is minute and after second decimal is second

The above table shows that college students use smartphones for an average of 4 hours, 34 minutes, and 53 seconds daily. The highest time is spent on entertainment use (1 hour, 59 minutes, and 9 seconds), followed by social media and voice calls (1 hour and 8 minutes), information searching (19 minutes and 55 seconds), and e-commerce (2 minutes and 36 seconds). Time spent on social media and making voice calls are the same.

It is found that boys use smartphones more time (4 hours, 50 minutes, and 48 seconds) than girls (4 hours, 24 minutes, and 48 seconds). Though purpose-wise, smartphone use patterns between boys and girls are similar, i.e., the highest duration for entertainment and the lowest time for e-commerce, the second order preference of boys is social media, whereas, for girls, it is a voice call. It is found that college students from rural areas use smartphones more in duration (4 hours, 16 minutes, and 3 seconds) than urban students (4 hours, 1 minute, and 43 seconds). Regarding the purpose of smartphone use pattern, it is found that rural college students spent the most time on voice calls (1 hour and 11 minutes), followed by entertainment (1 hour, 1 minute, and 1 second), followed by social media (1 hour); whereas urban students use pattern is the highest time for entertainments, followed by social media and followed by voice call.

It can be found that Arts students use smartphones a little more time (4 hours and 51 minutes) than science students (4 hours and 33 minutes) and commerce students (4 hours and 32 minutes). The purpose of Arts students is to spend time on entertainment, voice calls and, social media. Science students use smartphones the most for entertainment, followed by social media and voice calls, respectively. Commerce students use smartphones at the highest time for entertainment, social media and voice calls. Academic streamwise smartphone use pattern is similar, i.e., highest time for entertainment and lowest time for e-commerce. However, concerning second-order preference, it is found that while science and commerce spend more time on social media, Arts students are on voice calls.

Effect of Predictors on the pattern of smartphone use

The effect of gender, residential locality, and academic streams on smart used time for information searching, entertainment, social media, voice calls, and e-commerce was estimated by multivariate analysis of variance. Before running factorial MANOVA, its assumptions are tested. The first assumption is that two or more dependent variables should be measured in the interval or ratio scale and two or more independent variables in the nominal scale. Here, all the dependent variables (purpose-wise smartphone used time) are in ratio scale, and all the independent variables (gender, residential locality, and academic stream) are in categorical scale. The second assumption is that there should not be any multivariate outliers or unusual combinations of scores on dependent variables, which is tested by the Mahalanobis distance test. The maximum distance value was 18.49, less than the Chi-square critical value at a .05 significance level with

Df-6. So, the lack of multivariate outliers in the distribution of scores assures for multivariate normality of distribution. The third assumption for MANOVA use is a homogeneous covariance matrix, i.e., the variance in each group should be equal. It is found from M Box' test that the calculated value $47.48 < p.05$. The statistics were found to be insignificant, which indicates the covariance matrices are roughly equal.

Table 3

Multivariate and Univariate Test Results of Effect of predictors on Smart phone use time duration

Predictor	Dependent variable	F Value	DF	Significance
Gender	MANOVA	Pillai Trace = .061, F(2.13), p=.064		
	Information Searching	.023	1	.879
	Entertainment	6.34	1	.013*
	Social Media	1.58	1	.210
	Voice Call	2.45	1	.119
	E-commerce	.38	1	.538
Residential Locality	MANOVA	Pillai Trace = .104, F(3.82), p=.003		
	Information Searching	4.01	1	.047*
	Entertainment	7.88	1	.006**
	Social Media	8.31	1	.004**
	Voice Call	.56	1	.452
	E-commerce	1.86	1	.174
Academic Stream	MANOVA	Pillai Trace = .133, F(2.34), p=.011		
	Information Searching	1.63	2	.198
	Entertainment	1.32	2	.270
	Social Media	3.36	2	.037*
	Voice Call	4.24	2	.016*
	E-commerce	1.47	2	.231

*No significant second and third order interaction effect were found

It is found from the value of the MANOVA test of Pillai's trace statistics that residential locality and academic stream have a significant effect (residential locality .104>p.01; Academic stream .133>p.05), but gender has no significant effect on the smartphone used time (.061<p.05). But this multivariate statistic says nothing regarding which predictors affect which dependent variable. So, it requires univariate test statistics results.

It is evident from the univariate test results that college student's residential locality has a significant effect on smartphone use time for information searching (F, 4.01>p.05), entertainment (F, 7.88>P.01) and social media (F, 8.31>P.01), but no significance effect on used time for voice call, social media, and e-commerce. College students from urban areas use smartphones significantly more time for information searching, social media, and entertainment than students from rural areas. Found that gender has a significant effect on smartphone use time for entertainment purposes (F, 6.34>p.05) but not on information searching, voice calls, social media, and e-commerce. Boys use smartphones significantly more time for entertainment purposes than girls. Found that the academic stream has a significant effect on smartphone use time for voice calls (F,4.26 >p.05) and social media (F,3.36 >p.05) only. No significant interaction effect was found on purpose-wise smartphone use time.

As the academic stream has three levels, found from the Post-hoc test (table-3), Arts students use smartphones significantly more time for voice calls than commerce students (Mean difference 1408>p.05), but no significant difference is found between Arts and science, science and commerce students. Similarly, it was found that Science students use smartphones significantly more time for social media than Arts students (mean difference 1151>p.05). No significant difference is found between Arts versus commerce and science versus commerce students.

Table 4

Post-Hoc Test for Effect of Academic stream on used time for Voice call and social media

Dependent Variable	(I) Stream	(J) Stream	Mean Difference (I-J)	Sig.
Voice call	Arts	Commerce	1408.37*	.012
		Science	787.38	.242
	Commerce	Arts	-1408.37*	.012
		Science	-620.98	.412
	Science	Arts	-787.38	.242
		Commerce	620.98	.412
Social Media	Arts	Commerce	-585.32	.398
		Science	-1151.75*	.031
	Commerce	Arts	585.32	.398
		Science	-566.43	.422
	Science	Arts	1151.75*	.031
		Commerce	566.43	.422

DISCUSSION

The findings show that college students from India use smartphones for an average of 4 hours and 34 minutes daily, which is approximately 19% of the total time of a day. Indian college students' smart phone use time duration is longer than college students from the USA, who uses smart phone an average of 3.5 hours per day (Clayton et al., 2015). College students primarily use smartphones for entertainment, social media, and voice call purposes, irrespective of gender, residential locality, and academic stream variations. Less time is spent on the smartphone for information searching and e-commerce. This pattern of smart phone use by Indian college students is the same as in other parts of the world, where college students use the smartphone either to connect with others or to entertain themselves (Van Deursen et al., 2015; Jeonget al., 2016; Salehan & Negahban, 2013).

The present findings that more time smartphone use by rural college students is dissimilar to the findings of Karmakar & Karmakar, 2017; and Sowndarya & Pattar, 2018 who have reported more time duration of smartphone use by urban residents but similar in spirit to the ASER, 2022 where has been reported for the high increase in smartphone users from rural area. The reasons may be better internet connectivity in rural areas and high motivation to use the smartphone as a new technological gadget. The present findings show that urban college students use their smartphones maximally for individualistic purpose like entertaining themselves and social media, but rural students use them for voice calls. This locality-based differential pattern of the smartphone may be explained from their value perspective. Rural people value interpersonal relationships and social bonding with closed groups but urban people value individualistic, self-centred life and virtual communication within wider groups (Pengcheng Wang, 2017; Patel and Rathod., 2011).

The present findings that more time smartphone use by college boys than girls is corroborated by the findings of Hassan & Hassan, 2016; Basu et al., 2018; Ghosh & Chatterjee, 2018; Awasthi et al., 2020 who have reported that boys from India are more addicted to smartphones compared to girls and contrary to the findings of Andone et al., 2016; Shahrestanaki et al., 2020. This may be due to gender-based normative cultural practice where boys get maximum autonomy, and adolescent girls are restricted in utilizing their own time and space (Awasthi et al., 2020). The findings show that boys use smartphones for entertainment but girls for voice calls and social media, which is similar to Andone et al, 2016; Chen et al., 2017 who have claimed that boys use smartphones for

playing games, watching videos and pornography, listening to music etc. This differential purpose of smartphone use by boys and girls may be explained by gender differential value preference. Girls value more for connecting with others and increasing interpersonal relationships (Park & Lee, 2012; Lee et al., 2016), but boys value more on self or self-pleasure and entertainment like watching videos and pornography, listening to music etc (Tsitsika et al., 2009; Chen et al., 2017).

It is evident from the study that college art students use smartphones more time duration and is for voice calls but science students use the maximum time for social media purposes, which is corroborated by the findings of Kotar, 2013; Fard et al., 2014; Williamson, 2011. Arts students' high time for voice calls may be due to their poor psychological well-being and low capacity to make independent decisions, which may cause them to talk more with family, friends, and relatives for emotional support (Kotar, 2013; Fard et al., 2014). Secondly, they may talk with friends frequently due to their preferred group-based learning strategy. The reason for science students' high time duration uses of social media may be the hardness of the subject, which may result in more academic stress, and students may desire to use social media as a medium for academic stress reduction. They may use social media to share and receive subject-related ideas or information with larger academic communities (Bich Diep et al., 2021).

CONCLUSIONS

Complete avoidance of smartphones is impossible and undesirable at present. Nevertheless, the purpose for use by college students is a serious concern by researchers and academicians. The use of smartphones primarily for entertainment, social media, and voice calls, known as addictive use, has adverse effects on physiology, psychology, and academia. The smartphone use pattern of girls, rural and Arts students is very much traditional, i.e. voice call, but the urban and boys are for self-centric or entertainment purposes, which is immediately shaped by their value system and distally influenced by economic, structural, and academic factors. Appropriate interventions should be undertaken for smartphone use socialisation, and more focus should be given to academic use rather than non-academic.

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UNDERSTANDING THE FACTORS INFLUENCING SUCCESSFUL ONLINE LEARNING OUTCOMES

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ABSTRACT

In the digital era, numerous learning and teaching modes are constantly introduced. Educators and students should adapt to these changes. The Covid-19 pandemic has shifted teaching and learning activities globally. In higher education, educators must achieve learning outcomes at the end of the learning session or period. Although various tools and techniques for teaching and learning were introduced and exercised. The arguments on the achievement of learning outcomes are still discussed. The dysfunctional alignment of technological features and teaching principles has led to many other issues in achieving learning outcomes. The lack of proper analysis and guidelines in assessing online learning effectiveness has motivated this study. This is because successful learning outcomes are one of the performance benchmarks that constitute student results and institutional performance and outcomes. The need to understand the driving factors of successful learning outcomes is vital. Thus, this paper aims to conceptualize factors that impact successful online learning outcomes. These factors include online learning modalities, students' interests, online learning support, and educators' qualities. The conceptual framework will provide the theoretical basis to understand past literature and hypotheses development. The framework developed will be further tested empirically to understand the relationship among the study variables. The findings of the larger research will provide insights into factors that contributed to successful learning outcomes. Suggest potential strategies to improve the highly contributed factors in achieving successful online learning outcomes. It could also examine areas lacking in all four factors that could be constantly improvised in higher education.

Keywords: online learning modalities, students' interests, online learning support, educators' qualities, successful online learning outcomes.

INTRODUCTION

Digitalization has changed traditional teaching and learning in many ways. Across numerous blended and flexible approaches measuring successful online learning outcomes is still a challenge. The education community strives to be more creative and effective in preparing learning approaches. Past studies discussed areas lacking that could not be neglected. Various challenges are found in online learning to all key players i.e., educators, institutions as well as students. Factors that are determinants of successful online learning outcomes are continuously discussed. Four factors investigated in this study are online learning modalities, students' interests, online learning support, and educators' qualities. The study by Andaregie (2021) quoted that the lack of online learning modalities is one of the

factors that impede online learning success. This factor refers to the lack of technological infrastructure. These infrastructures could refer to devices (tangible) and network services (intangible). Poor connectivity or accessibility and inadequate equipment are challenges to students and educators in performing online learning. Besides learning modalities, students' interests also played huge roles in Online Distance Learning (ODL) implementation. Özüdoğru, (2021) highlighted that students' lower interests are associated with the inability to focus and socialize. They were incapable of communicating, accustomed to the system, and remained passive. All these issues may lead to poor learning outcomes. Online learning support facilitated by the institution is also critical. The institution's management could constantly review platforms and technologies provided for online learning. This could also include integration that is related to equipment and network. The final factor examined is educators' qualities that measured educators' skills and engagement. Their capabilities to communicate, and share information and knowledge. These qualities are important to ensure the achievement of learning outcomes that consequently display the success of learning and students' performance (results and grades). This paper is organized as follows: the next section presents the research methodology on how the conceptual framework was developed and formulated. Follows by literature review of the four variables investigated. In this section, two underpinning theories are discussed. The final two sections are results and discussion and conclusion.

METHODOLOGY

Learning Outcomes (LOs) displayed changes before and after learning that happened to students i.e., the recipients of the learning delivery. The changes constituted with learners' comprehension, perceptions, skills and learning experiences. The online LOs are different to the traditional way of learning. They are more complex and vary with assessments structures. The concept of LOs has various definitions from diverse researchers. Prior studies stressed that LOs parameters can come in various ways. LOs are always associated with students' satisfaction and one of the measurements at higher education is students' feedback. Many studies argued on how sufficient of student evaluation on the learning content and educators to assess the extent of learning success. More research is needed to understand determinants of successful online learning outcomes.

Lim (2023) highlighted that more studies are required to understand the consensus of successful LOs. Past studies verified that LOs are measured by final scores and learning performance. However, factors that contributed to successful LOs may vary and more studies could be conducted. Successful online LOs could be defined as effective learning outcomes and the driving factors should be better understood and studied. Successful LOs constituted with a digital promise between learners and educators. Agreement that binding to the contents of the promise. This agreement comprises of cognitive, emotional, and behavioral engagement (Morris-Eyton, H., & Pretorius, E. 2023)

When ODL started at higher education in many countries, especially during Covid19 pandemic many students and institutions unprepared and lack of infrastructures. This sudden environment leads to many challenges. These challenges include lack of preparation in human and material, students have problem in coping with learning activities, lack of technological support etc. There is a serious dysfunction between the technological features that are put forward and the shortage or non-existence of teaching principles for online learning. There are no guidelines for analyzing the effectiveness of online learning (Alonso et al., 2005; Castro & Tumibay, 2021). This study aims to fill this gap, helping the education system to identify the solutions. In this context of study, four driving factors that examined which include: online learning modalities, students' interests, online learning support, and educators' qualities. These factors are derived from past validated studies in higher education worldwide and are further discussed in the next paragraph followed by the framework formulation.

The quick shift from traditional learning to online has led to various issues. Lack of preparation from the human and material side consequently has impacted the learning processes and

the outcome. Network problems, equipment problems like poor quality computers, smart phones, audio devices have led to incomplete material and low participation from students because they cannot focus and fully concentrate in class. These kinds of barriers will disrupt the achievement of learning outcomes. Due to its importance online learning modalities hypothesized to be driving factor of successful learning outcomes.

Transformation from traditional learning to online learning has required quick adaptation from the learners. At higher education although students are above 18 years old their capability to shift to the new environment may vary from one student to another (Henriksen et al., 2022). Lack of studies investigate on students interests issues that related to online learning (Rehman & Fatima, 2021). numerous issues highlighted by a and b. These issues could not be neglected as they could enhance the extent of successful learning outcomes achievement. Setiana, D. S., Kusumaningrum, B., & Purwoko, R. Y. (2021) suggested that students' interest need to be constantly increased. This is because it will address all the issues that related to low interest in learning and such the learning objectives will not be achieved.

The implementation of online learning requires the best quality of technology integration. This integration facilitated the equipment for educators and learners, network and accessibility, and other technical supports. Since the Covid19 pandemic institutional support for online learning has been found to be lacking in many ways. Universities are not well prepared to provide appropriate and sufficient learning support to deliver online learning.

The arguments in past studies highlighted those assumptions that learners are self-motivated and capable of learning on their own have led to many types of failure and poor services. The extent of online learning support provided for students from the beginning until the end of the learning period may vary depending on the type of course or module delivered. The higher education institution could constantly assume that learners come from different backgrounds and have different levels of digitally savvy users. They may be novice users of digital devices and applications and several of them could be technology savvy people.

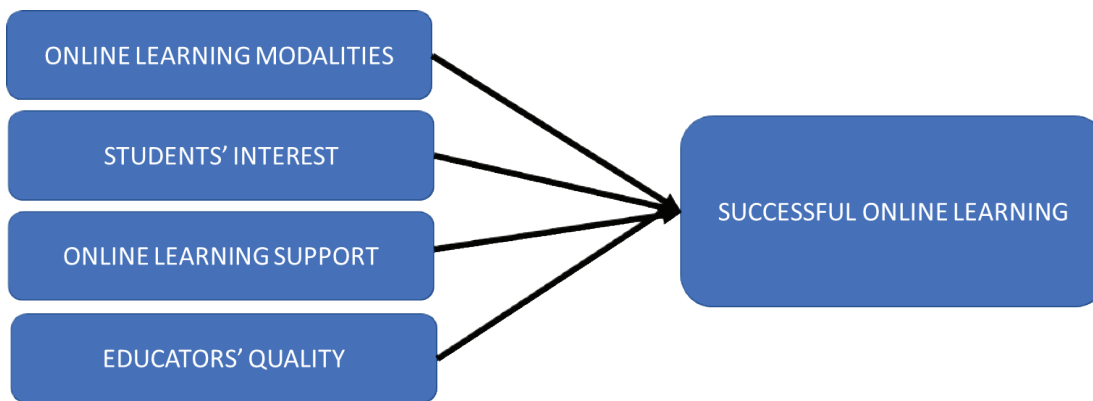
Another argument discussed is the readiness of Information Technology (IT) people in support, configuration, troubleshooting, and maintenance services. This could be done with the preparation of many aspects. Based on MQA by Malaysia Higher Education learning platform (support) is one of the key elements in online learning (Malaysia Qualification Agency (MQA), 2019). The balance of learning platform, assessment, and interaction is critical in ODL. In this context of research, assessment categorized as learning support and interaction is considered as educators' qualities i.e., educators' engagement with students.

Communication and engagement of educators are really critical in online learning. Educators are the key people that deliver the learning material to the learners. Comprehension of learners on learning material depends on the tools and techniques used by educators (Jackson et al., 2022). Besides the qualification of educators, the skills and capabilities of educators are vital in ensuring the achievement of learning content deliveries. Besides communication skills and engagement skills, educators should be well-versed in digital teaching skills. These three factors were found to be driving factors for better learning outcome achievement. Lack of these skills was also empirically found to be the reason for poor or weak achievement of LOs. Prior studies examined numerous issues on educators' skills that led to failure in online learning execution.

From the research gaps discussed above, and the relevancy of the four variables as driving factors of successful OLs this paper formulates the following conceptual framework

Figure 1

The Proposed Conceptual Framework



LITERATURE REVIEW

Online Learning Modalities

Although online learning assists in the continuity and flexibility of learning, the quick shift from traditional to virtual has affected the higher education stakeholders. One of the main challenges found in online learning modalities. online learning modalities defined the low-technology and high-technology infrastructures provided by institutions to facilitate online learning deliveries. The lack of online learning modalities has resulted in failure and unsuccessful online deliveries (Jackson et al., 2022). During the pandemic, students and educators found themselves in an urgent situation to adjust quickly to online learning and teaching with 100 percent online. Although online learning and virtual classes help in continuity and flexibility of learning, the quick shift from traditional to online learning affected students unevenly in a completely unprepared and sudden environment (Auxier, 2020).

Students are proven to have problems coping with the learning activities along the time of the MCO due to variety of reasons. Among the reasons are lack of online learning modalities and this is proven by (Andaregie A., 2021) that conducted research in Ethiopia - the closures during the lockdown highly affected students due to lack of technological infrastructure in rural areas and for most poor household in urban areas amplify the problem in Ethiopia. The inaccessibility to technology such as lack of Internet, lack of computer, unsuitable smart phone for the courses, poor quality microphone and headphone, caught up the students unprepared in class participation.

In addition, while some students were in the city centers, some tried to participate from villages with various Internet connection difficulties. Likewise, whereas some of them participated with their computers and prepared homework, some tried to participate in the classes and prepare homework by connecting via phones or tablets with inadequate equipment. Similarly, (Apriyanti, 2020) stated that lack of Internet access and digital tools in villages or rural areas was a barrier to online learning. The scarcity of information and communication technologies resources also a barrier to online learning.

A lot of studies have been made on the issue of online learning modalities. One study stated that a better online learning modalities need to be created for education that even include the laboratory practices (Basilaia, 2020), this is especially crucial for the science and technology modules that require students to undergo physical practice.

A study made by (Frank van Cappelle, 2021), found that the student's perception of learning is linked to the type of learning modalities such as high-tech modalities (live video lesson, learning applications, etc.) and low or no-tech modalities (radio, television, private tutoring, etc.). It is suggested to study the new teaching applications such as Quizzes (Thulasirani A/P

Munuyandi, 2021), Edmodo and Kahoot (Eulis Endangsari, 2020), and blogs as compared to MS PowerPoint and Youtube for current online learning modalities. It is proven that the ICT is beneficial for innovative learning, and these applications are developed to help students master the multi-dimensional abilities needed in the 21st century. In the long run, the development of educational technologies could take place constantly (Mahmood & Zainal, 2023). Higher education should incorporate high-tech online learning modalities. The development of full utilization of Internet tools for teaching and learning. The usage of hardware and software equipped with high-speed networks. The integration of these three items will enhance the deliveries.

Student's Interest

Another major concern in online learning success is students' participation. Siklander, Kangas, Ruhalahti and Korva (2017) suggest that students' absence indicates that the learning experience has failed to foster students' learning interest. Meanwhile (Santika, Sutisnawati and Uswantun (2020); Yunitasari and Hanifah; Kurniawan) highlighted that students' learning interest has a direct impact towards learning achievement. As student interest is an intangible component, researchers cannot measure it directly, rather they must infer from the characteristics indicating the presence of interest. Dafit, Riawan and Betty (2021) measures student interest using four indicators: seriousness to complete tasks in best manner possible, effort to resolve difficulties, accessibility to study convenience, and enthusiasm to attend online learning.

Online learning is more self-directed compared to conventional learning. Thus, it is important to foster student willingness to voluntarily engage in the learning process. Chun Lai, Mark Shum & Yan Tian (2014) concluded from their literature review that the willingness to engage in online learning depends on initial motivation and maintenance of the interest. While initial motivation is learner-centered and relates a lot to learners' personal characteristics and learning motives, this eagerness will fade. Educators need to convey their availability to support the learning process clearly enough to the students (Lai, 2013) as students' perception of support availability has been identified as a maintenance factor of students' willingness to engage in online learning. Furthermore, the education environment is found to be a major contributor to fostering students' learning interest, specifically situational interest which is an interest activated by the immediate environment (Hidi, 2006; Schraw and Lehman, 2001 as cited in Sun and Rueda, 2012) Situational interest is an extrinsic motivation that lies within the educators' loci of control, as compared to initial motivation which is a type of intrinsic that varies from one student to another and hard to be altered by other stakeholders.

It is found that the students' interest has a positive correlation with online platform usage in various study fields around the globe. In the language field, students feel more interested as they explore new, engaging features in the platform provided. Chun Lai, Mark Shum & Yan Tian (2014) tested quantitatively on China undergraduate students experiencing 12 weeks of courses on self-directed online learning. The pre-post test is done to compare the differences and results yield an improvement in students' interest in learning the language. Among the factors identified is the availability of innovative, engaging features for the students to try. This indicates that effective technology usage is an improvement factor for overall student interest which directly links to student achievement.

Similarly, in Mathematics field, Sutriyani (2020) conducted a quantitative survey to generalize the influence of online learning towards students' interest and learning outcome. The university students rated their learning experience via WhatsApp and other e-learning platforms as beneficial in improving their learning interest. Next, evidence is found in the information technology field, specifically Statistics subject. Electronic technology such as Google Classroom, WhatsApp, Zoom, YouTube, and other media are adopted to ensure the effectiveness of online learning among college students. It is found that these media produce a positive impact in terms of students' interest in learning the subject.

Online Learning Support

Online learning supports associated with web-based platforms and technologies, integration, network and accessibility, and other technical supports. Management of higher education should be well-prepared to face any obstacles in technology integration that could hinder or slower the online learning deliveries. The technical supports that should be prioritize in real time are configuration, remote maintenance, troubleshooting, backup and recovery and etc. This readiness not only depending on infrastructures but also to human competencies support. Information Technology team should be upskilling to face this transformation.

The development of a Learning Management System (LMS) as a one-stop center for students is also increasingly accepted. However, the early examination of the current environment of the location of institutions, educators, and learners, the readiness of management, educators, and learners, the readiness of facilities provided by the institutions as well as the connectivity/network providers. The development of learning support should align with the current environment of institutions, educators, and learners.

Educator Qualities

A review of past studies revealed that findings on educator qualities are critical in online deliveries (Gunasegaran, 2023; Mahmood & Zainal, 2023). Comprehension and development of these qualities are very vital for successful outcomes for students in higher education institutions. (Gunasegaran, 2023). Strategies to upskill the educators' qualities are required as they work tirelessly to bridge the gaps in engagement, communication, and accessibility (Mahmood & Zainal, 2023). Finding essential key skills for educators is critical. These essential skills could be discovered from research and observation. empowering educators with these qualities could improve the qualities of online learning. Thus, higher institutions could come up with better strategies for the enhancement of human and inhuman factors in online learning deliveries.

Discussion in other studies argued on how to motivate educators on constant upskilling (White & LaBelle, 2022). This is because Rahmat et al., (2021) quoted those high requirements and expectations for educators to be well prepared with teaching materials and skills added with better online deliveries without any trouble has led to other issues. This could mentally abuse educators to be perfect continuously. Therefore, educators' qualities factor should come with institutional support that could blend well in driving successful online learning outcomes.

Study by Nugroho, (2022) highlighted that educator quality is vital in online learning because they play a huge role in designing, directing, guiding, and carrying out learning activities. The findings also stressed how important educators' qualities are besides having good qualifications. This is because based on the findings's students' dissatisfaction with how the educators conducted the class is among the highest amount of negative feedback. An in-depth study is required to examine the quality of educators from many perspectives (Mahjabeen, n.d.). These perspectives involved the student perspective, criteria by the Ministry of higher education, etc. Thus, educators, as a milestone in the quality of online learning consequently enhance the success of LOs. Educators' qualities may vary from one to another. However, generally, educators could have a set of criteria that comprised of education, experience, setting, roles, and professional development (Gardner-Neblett et al., 2020) In addition, the capabilities of educators to facilitate interactive learning, self-directedness, and conducive learning environment (Alhasov et al., 2020; Gardner-Neblett et al., 2020).

In the digital era, many studies parallel the requirement of digital skills among educators. Educators must continuously adapt to this change and transformation (Adiman et al., 2019; Vithanapathirana, 2019). The combination of qualification, meaningful use of technology, quality teaching, and meaningful learning are essential parts of 21st century education. This study also proposed the development of profile for educators. This profile referred

to professional development with collaborative work (Nugroho, 2022; Vithanapathirana, 2019; White & LaBelle, 2022) Similarly, to a study by Kukreja et al., (2021) educators' (instructors) qualities are critical because of their role in shaping student success. The study's findings confirmed that educators' qualities significantly impact students' satisfaction. This satisfaction could not be achieved without the achievement of learning objectives and outcomes. Therefore, this study investigation could further understand the driving factors of educators' qualities.

Successful Online Learning Outcomes

Learning Outcomes (LOs) associated with students' feedback and satisfaction during and post online deliveries. One of the measurements could be assessed through students' performance which could be analyzed from their grades and results (Lim, 2023). In the pre-pandemic, pandemic, and post-pandemic (endemic) era, higher education institutions should adapt to the needs of online LOs. These requirements are not only complex, but they also involve the collaboration of many stakeholders (Rahmat et al., 2021).

Evidently, successful online learning cannot continue without pedagogical principles that govern good educational practices. And as far as online learning is concerned, its success is represented by instructional methods. This instructional method in terms of its design, has evolved in combination mainly with the development of the three basic learning theories: behaviorism, cognitivism, and constructivism.

The theory of behaviorism concentrates on the study of overt behaviors that can be observed and measured. It views the mind as a "black box" in the sense that response to stimulus can be observed quantitatively (Good, 1990). On the other hand, the cognitivism theory views learning as involving the acquisition of the cognitive structures through which humans process and store information. Mental processes transform the information received through the eyes and ears into knowledge and skills within the human memory. The last theory is constructivism which builds upon behaviorism and cognitivism in the sense that it accepts multiple perspectives, and that learning is a personal interpretation of the world (Piaget, 1983). A combination of these three perspectives builds an instructional method for online learning. It uses a variety of digital technologies, such as the Internet, web-based applications, computer devices, online curriculum, and more to facilitate a successful online learning experience.

The instructional method defines online learning as a set of facts, concepts, processes, procedures, and principles that can be learned on the basis of the current knowledge of the learner. The online learning is divided into 6 sections: 1) Presentation 2) Objectives 3) Knowledge 4) Learning tasks 5) Practice and 6) Conclusion. This online learning structure provides a consistent framework that covers the needs for instructional methods. Students' learning outcomes and student satisfaction can represent a better understanding of successful online learning (Julie A. Gray, 2016).

A study on students' perception of learning during the pandemic found that the factors of – interaction in the classroom, student motivation, course structure, instructor knowledge, and facilitation – are positively influencing students' learning outcomes outcome and student satisfaction (Baber, 2020). A study from India found that the majority university faculty thinks that Massive Open Online Courses (MOOC) – a similar platform to LMS and VLE – has a direct impact on improving successful online learning outcomes (Mohammed Arshad Khan, 2020). From this study, the successful online learning outcomes are significantly relevant to students who attended online learning provided that their online platform is user-friendly, accommodative, and able to quickly give feedback. The concept of online learning outcomes has various definitions from diverse researchers. However, it is generally considered to be a final goal when evaluating online learning. Various factors have been identified to enhance the online learning outcomes in learners; one's satisfaction, learning flow, and feeling of joy during the learning were determined to be the influencing factors of successful online learning outcomes (Sin-Hyang Kim, 2021).

Underpinning Theories

Self-Determination Theory (SDT)

A generic Self-Determination Theory (SDT) quoted by Chiu, (2021), is being used to the construction of the present conceptual framework. The generic framework supports the original SDT three innates - autonomy, competence, and relatedness – in a blended learning. The generic Self-Determination Theory (SDT) framework for needs support for blended learning. The combination of teacher support, digital support and Student engagement.

This study offers teachers three practical suggestions for satisfying the need for greater engagement in online learning environments. The first practical suggestion is to design learning resources that promote autonomy. These learning resources should emphasize the sensory channel. The second suggestion is to design the technological learning environment, including LMS, to address learners' cognitive load. In designing the environment, multimedia learning principles should be used as guidance for catering learner diversity. Students will feel more competent if the design of the environment considers cognitive load. The last suggestion is to design positive relatedness between emotional and technological learning environment. The optimization of positive emotions has been shown to enhance online learning process. Appealing designs with warm colours should be considered when designing the environment because it can facilitate successful learning outcomes by inducing positive emotions.

The Technology-Mediated Learning (TML)

The Technology-Mediated Learning (TML) proposed by Sean B. Eom (2016) has contributed to the development of the present conceptual framework. The theory views e-learning as an open system of three entities: students, instructors, and Learner Management System (LMS), that continuously interact with one another and with their environment to optimize e-learning outcomes and student satisfaction. This model is based on the constructivist learning theories and derived from a synthesis of the Virtual Learning Environment (VLE) effectiveness model of Gabriele Piccoli et al (2001) and the framework of the Technology-Mediated Learning (TML) research of Alavi and Riedner (2001).

There are two distinct processes that produce learning outcomes. The first process created and managed by instructor specified in course design which will affect the psychological learning process and then affect the learning outcomes and satisfaction. The second process characterizes psychological and cognitive student learning which composed of series of phases (perception, attention, coding, retrieval, and metacognition) that are supported by different types of memories (sensory memory, working memory and long-term memory) (Fernando Alonso et al, 2005). The cornerstone of the TML research framework is that the psychological learning process is the primary predecessor of learning outcomes. It is affected by multiple dimensions of learners' characteristics including physiological (biological characteristics), personality (motivation, curiosity, and emotion), cognitive (logical analysis or "gut" feelings) and psychological differences (Dunn, Beaudry & Klavas, 1989).

DISCUSSION AND CONCLUSION

Educational technologies have continuously enriched from time to time. The need for various research perspectives is important to facilitate different requirements in different contexts of environments and issues. The review of past studies revealed the importance of devices, networks, and humans in online learning processes. Adding key stakeholders that comprise learners, educators, and higher education management teams. The combination and integration of best practices in high-tech or low-tech learning modalities, good student participation, learning support from institutions, and engagement from educators are hypothesized to be key driving factors in attaining successful learning outcomes.

This study presented the concept of online learning by focusing on the factors that are critical in enhancing the achievement of online learning deliveries and consequently attaining the learning outcomes. Yet, not just attaining them the empirical study aims to examine the factors that could achieve the higher extent of learning outcomes which refer to successful learning outcomes. Based on the extensive literature review, numerous studies confirmed elements of online learning. The demand for technological tools and human skills in online learning deliveries should be highly prioritized. The need for continuous improvement in the development processes could be emphasized at the national and institutional levels.

This paper has critically reviewed frameworks, theories, definitions, driving factors of successful online learning outcomes, and suggested factors for a conceptual framework grounded in online learning literature. The findings conceptualize the variables that may positively impact successful online learning outcomes in higher education. This paper discovered the relevancy of four variables that could drive in achievement of successful learning outcomes. In the next stage of research, the empirical data needed to further confirm the hypotheses developed.

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I-GENIUS MODULE: STRENGTHENING HIGHER-ORDER THINKING SKILLS THROUGH DIGITAL LEARNING IN SCIENCE SUBJECTS

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ABSTRACT

This study evaluates the effectiveness of the i-Genius teaching module on students' higher-order thinking skills. This study uses a quasi-experimental design using pre-and post-tests. The development of this module is based on the ADDIE model, which consists of an analysis phase, a design phase, an implementation phase, an evaluation phase, and an implementation phase. The evaluation phase involves five experts in the field of science to verify the content and usability of the module. The interview method with 5 primary school science teachers was used to determine the needs of the study, and the respondents were selected by purposive sampling. Next, the results of the interview analysis are used to help in the development of teaching modules. A total of 70 respondents were among Year 5 primary school students from two different schools. The pre-and post-test results are used to evaluate the effectiveness of the i-Genius module. The findings of the study also show that there is an increase in the level of high-order thinking skills in both the treatment group (mean=59.03, SP=12.94) and the control group (mean=34.66, SP=11.37), with the treatment group showing a significantly higher increase in achievement compared to the control group. In conclusion, this study found that this i-Genius teaching module effectively improves the high-order thinking skills of year 5 students. The output of this module provides input for teaching and facilitation to improve students' higher-order thinking skills in primary school science subjects.

Keywords: Higher-order thinking skills, quasi-experimental design, ADDIE model

INTRODUCTION

Digital learning is a method that can fulfil the learning goals of the 21st century because it can ensure that students are not passive during the teaching and facilitating process (Abdolreza et al., 2017). Digital learning is one of the methods that can help realise the learning goals of the 21st century. This strategy can assist educators in capturing their pupils' interest and recognising the potential that lies inside those kids. Evidence shows that incorporating digital learning into traditional teaching and learning activities can enhance the educational experience (Al-Azawi et al., 2016).

In addition, digital learning is a teaching strategy that improves learning efficiency through teaching activities that are student-centred learning (Al-Azawi et al., 2016). This balance between learning in the classroom and studying independently is achieved using digital learning, a teaching strategy. Unlike traditional learning, which frequently fails to spark students' interest in what they learn in class Alamri (2016), digital learning can provide chances for students to enjoy and effectively learn science subjects, leading to improved academic performance.

As a result, implementing digital learning components can make students appreciate science topics more, which is one solution for combating student boredom. This method is also particularly ideal for usage as a way that can be utilised as an alternative to the

standard teacher-centred method (Nor Adibah, 2020). In step with the progression of technology, digital learning platforms can facilitate easy self-learning for each student and reveal the students' relative strengths and shortcomings in a roundabout way.

METHODOLOGY

Research Design

For the purpose of this research project, a study design that makes use of multiple methodologies will be carried out. According to Fraenkel et al. (2012), the simultaneous use of quantitative and qualitative research procedures within a single investigation distinguishes mixed methods research from other types of research. The idea that every research method contains its own defects and biases was the driving force behind choosing this method for this study (Creswell, 2014). Nevertheless, the quality of the study could be improved by collecting additional data that are more thorough and by obtaining additional information that is more convincing to support the results obtained by the researchers (Creswell, 2014; Schram Christensen, 2017; Hafsa, 2019). For this examination, the researcher used a mixed design (Creswell & Plano, 2011), where quantitative methods served as the primary approach and qualitative methods served to support the quantitative approaches. The primary approach was quantitative research. The conclusion was a design that was motivated by quantitative considerations. Combining qualitative data into a quantitative design, such as an experiment, is an integrative design, a word developed by Creswell and Plano (2011) to characterise the process. The quantitative approach will be applied extensively throughout the subsequent stages of this inquiry, beginning with this stage. The researcher will then conduct interviews with the participants to collect their feedback and hear about their experiences concerning their participation in the experiment.

Sampling Procedure

Students in year five who attend two different elementary schools in the Seremban District make up the research sample. Students in year five from two different schools comprise the study's total population, totalling 200 individuals. Selection of samples using a random sampling procedure. If the treatment that is administered following the completion of the control shows a significant effect on the treatment group in comparison to the control group, then the same effect can also be generalised to the entire population that is represented by both the control and treatment groups, even though the sample used is relatively small in comparison to the population. A total of 70 pupils participated, with each school contributing 35 pupils. It is necessary to have a relatively small sample size to simplify the process of controlling the effects of extraneous variables.

Data Analysis

To facilitate data analysis, the researcher has built a table as follows:-

Table 1

Summary of data analysis

No	Research Question	Sample	Method	Instrument	Data analysis technique
1	Is there a significant mean score difference between the treatment and control groups?	70 students	Quasi experiment Year 5 students	Pre and Post Test	T-test
2	To what extent can digital learning improve students' higher-order thinking skills in the treatment group compared to the control group?	5 students	Interview Year 5 students	Interview protocol	Coding/ thematic

LITERATURE REVIEW

In addition to other areas of Malaysian culture and lifestyle, the country's educational system has been undergoing significant shifts to prepare for the 21st century. Before 1982, the primary school curriculum in the Malaysian education system went through three distinct iterations. Initially, there was the Old Primary School Curriculum (OPSC), then there was the New Primary School Curriculum (NPSC), and finally, there was the Standard Primary School Curriculum (SPSC). The OPSC was implemented into law sometime after Malaysia gained independence in 1960. OPSC was established in 1957, not long after the conclusion of the investigation into the Razak Report that the Rahman Talib Report conducted. In 1961, in addition to the presentation of several ideas, the establishment of the Education Act (Ahmady et al., 2018) also took place. This curriculum aims to facilitate the integration of Malaysians whose family trees include members of more than one racial group (Segawa, 2007; Rajendran, 2008; Nor et al., 2017). 1982 was the year that saw the execution of the subsequent iteration of NPSC. The government delayed its implementation of Kindergarten through Fifth Grade Integrated Curriculum, often known as NPSC, for an entire year before ultimately putting it into effect. This curriculum aims to provide equivalent opportunities for every student to learn the information, skills, attitudes, regulations, and good social behaviours required in society. The curriculum's goal is to achieve that goal. In the end, SPSC was developed and made available to the public in the same year, in 2011, to meet the demands that students in the 21st century have.

Higher Order Thinking Skills

According to Brookhart (2010), a more pragmatic understanding of higher-order thinking skills (HOTS) can be achieved by organising them into three distinct categories: (i) HOTS related to the ability to transfer knowledge, (ii) HOTS associated with critical thinking, and (iii) HOTS centred around problem-solving abilities. The transfer process involves acquiring knowledge and promoting students' comprehension and application (Anderson & Krathwohl, 2001). On the other hand, critical thinking encompasses a range of cognitive abilities such as questioning, reasoning, observing, describing, making connections, comparing, and exploring different perspectives (Barahal, 2008). Additionally, problem-solving necessitates cognitive processes that foster the development of self-regulated learners (Szabo & Schwartz, 2011).

Despite the diverse range of interpretations and descriptions surrounding higher-order thinking skills (HOTS), a shared characteristic requires pupils to blend cognitive processes to apply HOTS effectively. This implies that promoting higher-order thinking skills (HOTS) among students necessitates meticulous and comprehensive preparation, suitable strategies, training, resources, and ample support from many stakeholders within the education community. The pivotal role of teachers in this endeavour is particularly significant.

Thinking abilities are vital talents that train the human brain to think critically and logically in the process of understanding knowledge, utilise analytical skills, solve problems, and enhance the capacity to make accurate decisions (Prima & Kaniawati, 2011; Prajapati et al., 2017 & Salonen et al. 2017). Thinking critically and logically is necessary for understanding information, utilising analytical skills, solving problems, and improving the ability to make accurate decisions. According to Salih (2010), Roekel (2011), and Smit (2015), it is essential for students to develop their thinking skills so that they can optimise their thinking skills, which in turn can improve their ability to solve problems in everyday life, analyse their thoughts to ensure that they have made the right decisions, and can be a condition to compete in a global world. Furthermore, thinking skills are essential for students to develop to optimise their thinking skills. The HOTS model can be interpreted as an intricate way of thinking, typically resulting in various responses to the questions being asked. This way of thinking requires an element of ambiguity present, the application of several different criteria, introspection, and the ability to self-regulate (Resnick, 1987). Most of the terms in HOTS are the same as those found in Bloom's Taxonomy (Bloom, 1956). The stages of application, analysis, and assessment, in addition to synthesis, are all included in the

HOTS framework. Experiential learning should focus primarily on application, analysis, assessment, and synthesis as its core areas of development. Doing so can reportedly aid in strengthening skills in problem-solving, making inferences, estimating, and anticipating, in addition to creative thinking, as stated in (Barak & Dori, 2009).

Assessing the Effectiveness of Higher Order Thinking Skills (HOTS) through Performance

In addition to the consistency of test scores, midterm exams, final term exams, and test scores contribute to a student's academic achievement. According to the findings presented by Wenglinsky (2004), there is a connection between the assessments that need HOTS and the overall performance of the students. Students who have HOTS can learn new things and increase their overall performance, as stated in (Yee et al., 2011). Ramos et al. (2013) realised that there is a connection between HOTS and the overall performance of the students that is linear, constructive, and meaningful. Students with a high degree of HOTS have a greater chance of achieving high levels throughout their academic careers. Jesen et al. (2014) investigated whether there was a connection between HOTS and the academic performance of university students in physics classes to determine whether there was a correlation between the two. Their research led them to the conclusion that the level of HOTS in analysis, comparison, and evaluation significantly impacts the physics performance of male students. In contrast, the level of HOTS in analysis, inference, and evaluation significantly impacts the physics performance of female students. This was the conclusion that they reached as a result of their findings. Because of this, the student's general academic performance can be a helpful signal for improving their HOTS in science learning.

An Assessment of Higher Order Thinking Skills (HOTS) via the Lens of Conceptual Change

Previous studies have reported that students with a high degree of HOTS have a profound level of conceptual knowledge (Che et al., 2011; Jesen et al., 2014). In addition to mental and mental simulations, participation in hands-on activities is required to acquire the requisite grasp of the concepts and processes pertaining to electrical themes. Students with a high level of conceptual understanding can exhibit their HOTS by successfully resolving various types of scientific problems. Besides that, Passelaigue and Munier (2015) found that the concept of characteristics and measurements can be discovered when scientific investigation and physical investigation meet. This is the intersection of the two fields. These two philosophies are fundamental to our comprehension of the world we find ourselves in. They also describe features that require researchers to compare an object viewed from a given perspective. This comparison could either take the form of a direct or indirect comparison, depending on the circumstances.

Theory of Uses and Gratification

McQuail (2010) claims that the Theory of Uses and Gratification (U&G) was initially established by Katz, Blumler, and Gurevitch in 1974. He also stated that this idea may be traced back to the early 1940s when scholars began investigating the factors driving individuals to engage with popular radio programs and daily newspapers. Consequently, the theory emerged in response to the need for elucidating the motivations behind individuals' consumption of specific media forms and the subsequent advantages they obtain from such engagement (Musa et al., 2015).

Uses and Gratifications (U&G) theory has been increasingly prevalent in contemporary initiatives to enhance the adoption of digital learning modules. This study investigates the social and psychological factors that influence individuals' choice of media consumption (Gan & Li, 2018). The approach focuses on the factors influencing individuals' choice of one media over other alternatives to meet their needs (Katz et al., 1974). This will enable the discernment of the social and psychological incentives that propel individuals to engage with specific forms of media. According to the Uses and Gratifications (U&G) hypothesis,

individuals engage in a deliberate process of media selection to fulfil their needs and preferences.

Theory of Multimedia Cognitive Learning

Research conducted by Mayer (2009) has encompassed numerous experiments involving diverse participants. As a result of his investigations, he has put forth a set of 12 design principles for multimedia learning. These principles serve as a valuable framework for effectively conveying data or information through auditory and visual channels. The goal of these principles, as stated in references Mayer (2009) and Santillán-Fernández et al. (2021), is to mitigate students' tendency to engage in repetition and to aid them in reducing their cognitive burdens, enhancing their ability to retain information in long-term memory. Due to the progress made in information and communications technology, digital learning environments have emerged as a potential avenue for facilitating students' comprehension of diverse educational concepts. Previous studies have investigated the impact of digital learning on education, specifically examining outcomes such as improved test performance, psychological effects, and HOTS (Li et al., 2019).

RESULTS AND DISCUSSION

Pre-Test Inference Data

The pre-test descriptive data for the study sample is shown in Table 2 below.

Table 2

Pre-Test Descriptive Data

Group	N	M	SD	t	df	Sig.
Treatment	35	26.86	14.09	1.65	68	.104
Control	35	21.66	12.24			

*Maximum test score is 50 if all answers are correct.

A statistical analysis using an independent t-test revealed that no statistically significant distinction was observed in the pre-test scores between the treatment group and the control group. The t-value (68) was 1.65, with a p-value greater than 0.05. Regarding the measure of central tendency, the pre-test scores of the treatment group (mean = 26.86) did not exhibit statistically significant disparities compared to those of the control group (mean = 21.66). According to the data presented in Table 1.2, a marginal disparity in the average score was seen between the control and treatment groups. Nevertheless, the kurtosis values for the pre-test of the experimental and control groups were between -1.0 and +1.0. These values demonstrate high suitability for psychometric applications [36]. Hence, the distribution of pre-test scores in the treatment and control groups is deemed suitable for research.

Post-Test Inference Data

The pre-test descriptive data for the study sample is shown in Table 3 below.

Table 3

Pre-Test Descriptive Data

Group	N	M	SD	t	df	Sig.
Treatment	35	59.03	12.94	8.37	68	.000
Control	35	34.66	11.37			

*Maximum test score is 50 if all answers are correct.

A statistical analysis using an independent t-test revealed a statistically significant disparity in the post-test scores between the treatment group and the control group, as indicated by the t-value (68) of 8.37, with a significance level of $p < .05$. Regarding the measure of central tendency, the post-test scores of the treatment group exhibited a statistically significant disparity when compared to those of the control group. Specifically, the mean score for the treatment group was 59.03, while the mean score for the control group was 34.66. According to the data presented in Table 3, a notable disparity in the average score was seen between the control group and the treatment group.

The Results of Post-Intervention Interview Findings

The researchers conducted in-depth interviews to investigate students' perspectives on digital learning within the context of classroom activities. The primary objective of this interview is to gather observational data and examine information about the benefits and drawbacks of digital learning methodologies. The sample size utilised for conducting interviews in this study comprises ten individuals. The primary objective of conducting interviews with students is to ascertain their responses and provide corroborating evidence for the study's findings. The researcher engaged in many readings of the interview transcription in order to facilitate comprehension for the students. Ten participants agreed with implementing a digital learning strategy regarding its utilisation inside primary educational institutions when queried. According to the responses provided by five participants, implementing digital learning methods is perceived to enhance students' engagement and enjoyment in the learning process. According to the survey results, six participants believed that students exhibit higher motivation levels and enhanced learning outcomes when engaged in digital learning. One of the participants, identified as Respondent 1 (R1), provided the following statement:

This strategy is quite suitable. Students exhibit a strong preference for being tasked with the undertaking of scientific experiments. One potential avenue for enhanced learning is an engagement in online project-based activities. The user's text does not contain any information to rewrite academically.

According to the statements provided by respondents 8 (R8) and 10 (R10), it can be inferred that using digital learning methods is perceived as enjoyable by students and facilitates their mastery of educational content.

The pedagogical style elicits enthusiasm among students, who eagerly engage in diverse activities encompassed within the digital learning materials. Digital learning offers students the advantage of convenient accessibility, enabling them to effectively acquire knowledge and skills about many subjects at their convenience and from any location. When individuals are supplied with online reinforcement training, their ability to engage in the training is facilitated by their prior mastery of the material through instructional videos provided by the teacher (R8).

This strategy greatly benefits pupils, and I concur with its efficacy. The implementation of digital learning methods should be prioritised in the education of students. The students express satisfaction with this method. Individuals can acquire knowledge at an accelerated pace when engaging in exercises beyond the confines of traditional book-based learning. Using digital learning methodologies is an optimal strategy for enhancing the educational outcomes of academically challenged individuals. Digital learning, often known as e-learning, is an educational approach that elicits a sense of satisfaction among students due to their ability to engage in the creation of online quizzes and games. Students can collaborate and exchange ideas with their peers (R10).

This study has the potential to assist educators in enhancing their instructional approaches and pedagogical techniques while teaching the subject of electricity. Digital learning activities can potentially enhance the efficacy of instructional methods employed in teaching and learning. Digital learning has been shown to enhance the comprehension and proficiency of students who struggle academically in electrical topics. Learning occurs

through the dynamic interaction and concerted effort of both academically challenged pupils and high-achieving students as they collaborate and concentrate on the successful completion of prescribed tasks. Collin and Sauvage (1989) describe cognitive apprenticeship as a learning approach that emphasises the acquisition of cognitive and metacognitive skills and processes through guided experiences rather than focusing solely on the physical.

Within the scope of this research, the educator implemented the instructional techniques of modelling, direction, and scaffolding during the intervention phase. During the modelling process, the instructor undertakes several tasks to enable students to observe and cultivate a conceptual model of the necessary steps to achieve the desired outcome. As stated by the cited source by Dennen and Burner (2017), the instructional process involves the teacher presenting the assignment, followed by the pupils' imitation. This procedure is frequently employed to facilitate the advancement of students within their Zone of Proximal Development (ZPD). Behaviour is the act of imitating demonstrated behaviours. In contrast, cognitive modelling entails the teacher presenting the decision-making process by explaining the underlying reasons or higher-order thinking skills (HOTS) employed to achieve the outcome. In this context, students should avoid plagiarism and instead employ a similar approach when confronted with a similar issue. Digital learning offers support in addressing a range of challenges encompassing the cognitive domains outlined in Bloom's Taxonomy, aiming to foster higher-order thinking skills (HOTS) among students. This problem will allow educators to exemplify various ways of resolving electrical issues. The teaching module provides educators with questioning techniques to support and facilitate guiding and scaffolding students' learning. Digital learning sources play a crucial role in supporting educators by providing teaching resources, including instructional aids, to assess students' existing abilities and levels of difficulty. During the initial phases of the pedagogical process, educators employ various illustrative instances presented in digital learning activities to elucidate the cognitive processes entailed.

The Implications for the Learning Process

Using digital learning methodologies necessitates the active engagement of students in four distinct phases. The organisation of classroom layouts is designed to facilitate collaborative learning, which aims to foster active learning as advocated in 21st-century education (Al-Azawi et al., 2016). According to Gokhale (1995), collaborative learning can enhance student engagement and foster critical thinking skills by facilitating the dynamic exchange of ideas within small group settings. The results of this study indicate that students who engage in digital learning exhibit enhanced comprehension of problem-solving strategies, concepts, and material, as well as improved decision-making abilities about the subject matter being studied. The digital learning module has been systematically created in alignment with the Standard and Curriculum Document. This arrangement aims to facilitate students' utilisation of digital learning platforms, foster their engagement in electrical subjects, and enhance their motivation to solve higher-order thinking skills (HOTS) challenges.

The findings from focus group discussions conducted with students after the intervention indicate that students exhibit a heightened motivation to engage in the learning process due to the implementation of meticulously designed activities incorporating diverse teaching and learning methodologies. In contrast to a sole dependence on direct instruction, digital learning classrooms equip students with the skills necessary to collaborate in groups, independently solve issues, and participate in group or whole-class discussions (Gutwill-Wise, 2001). Using digital learning activities might be highly advantageous for pupils in Year 5. In addition, within these digital learning activities, students are encouraged to engage in metacognitive processes by articulating their thought processes and justifying their approaches when completing assignments. During this phase, pupils transform their implicit knowledge into explicit knowledge (Spooner et al., 2011; Che et al., 2011). Hence, educators can discern whether students harbour misconceptions, employ erroneous computations, or employ insufficient procedures. Subsequently, the instructor prompts students to compare their problem-solving approaches with those of more proficient peers, encouraging reflective thinking (Rasmussen & Collins, 1991).

On the other hand, students are encouraged to freely discuss and provide feedback on how their tactics align with those of their peers within the collective. This method aims to enhance students' problem-solving abilities, conceptual understanding, and procedural expertise. Based on the findings of the referenced study (Hutkemri & Effandi, 2012; Yee et al., 2011), it has been seen that students who actively engage in the supplied activities demonstrate a higher level of cognitive involvement, leading to the active generation and development of conceptual understanding about the subjects being studied. This concept facilitates how pupils can effectively construct their novel knowledge.

The Implications of the Combination Between the Theory of Uses and Gratification By Katz, Blumler, and Gurevitch (1974) with the Cognitive Theory of Multimedia Learning By Mayer and Moreno (2002).

Integrating both theories facilitates a more comprehensive comprehension of the influence of variables such as satisfaction, a sense of use, cognitive perception, and learning on the multimedia experience. According to the Theory of Uses and Gratification proposed by Karts et al. (1974), consumer happiness is contingent upon three primary elements, namely:

- a. Trust is a crucial factor in the utilisation of media by students since they must have confidence in the accuracy and reliability of the information provided.
- b. User Comfort: Students must experience comfort when engaging with media, encompassing the interface and navigation aspects.
- c. An Engagement: Students must exhibit a genuine interest in the subject matter presented through the media they use.

The Cognitive Theory of Multimedia Learning, as proposed by Mayer and Moreno (2002), centres its attention on how individuals acquire knowledge and understand through multimedia materials. This theory posits that the learning process can be categorised into two modalities: verbal, which involves using written or spoken words, and visual, which encompasses pictures, animations, or videos. Based on the hypothesis, the efficacy of multimedia is contingent upon the seamless integration of these two modalities in facilitating students' cognitive processing and retention of knowledge. The integration of these two theories elucidates that the efficacy of multimedia utilisation is contingent upon three primary determinants: trust, comfort, and attractiveness, as posited by the Theory of Satisfaction and Consumerism. Additionally, the Cognitive Theory of Multimedia Learning asserts that the amalgamation of verbal and visual modalities within multimedia aids in students' cognitive processing and retention of information. In addition to this, the integration of multimedia in educational practices has the potential to enhance user engagement by considering elements such as the calibre of content, interactive learning opportunities, and interface design, which influence students' trust, comfort, and interest in participating in instructional and facilitation endeavours (Katz et al., 1974). Furthermore, the incorporation of multimedia can be considered when examining the way educational material is conveyed. This encompasses the utilisation of written or verbal language, as well as visual aids such as images, animations, or videos, to enhance students' cognitive processing and retention of information.

CONCLUSION

The use of digital learning methodologies inside the i-Genius module can potentially enhance teaching effectiveness across many levels. Digital learning in science education can impact the development of favourable attitudes among students of diverse age groups towards science disciplines while fostering heightened motivation and academic performance compared to conventional instructional methods. Furthermore, this module promotes active engagement among students, hence enhancing the overall quality of the science teaching process. Hence, the utilisation of digital learning in the context of science education can serve as a viable alternative to conventional teaching methodologies.

Based on existing research and contemporary trends, it can be inferred that digital learning benefits higher-order cognitive abilities and academic performance in science (Salih, 2010; Roekel, 2011; Smit, 2015). Digital platforms provide intrinsic interactive features that successfully drive student participation, hence fostering the cultivation of critical thinking, problem-solving, and analytical proficiencies. Additionally, a wide range of multimedia tools enhances the understanding and lasting recall of complex scientific concepts. The personalised aspect of digital learning enables students to progress at their desired pace, matching their distinct learning preferences. Therefore, the implementation of digital learning has the potential to significantly strengthen cognitive skills related to critical thinking and promote academic achievement in scientific education.

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E-WALLET USAGE AMONG RURAL YOUTH IN MALAYSIA: AN ADOPTION OF TECHNOLOGY ACCEPTANCE MODEL (TAM)

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ABSTRACT

This study examined the relationships between perceived usefulness (PU), perceived ease of use (PEOU), trust (TR), and continuance intention of e-wallet usage (CIEU) among rural youth in Malaysia, with the mediating role of TR. Technology Acceptance Model (TAM) was adopted to design quantitative research in which a self-administered questionnaire was given to a sample of rural youth in Malaysia's East Coast Region. The suggested model and hypotheses were evaluated using survey data from 500 participants using PLS-SEM. The empirical findings reveal that PU, PEOU, and TR substantially impacted CIEU among rural youth. Additionally, it is shown that PU and PEOU indirectly affect the CIEU, with TR as a crucial mediating factor. This study concludes with important conclusions for professionals and stakeholders by illuminating the factors that might increase rural youth's desire to use e-wallets efficiently. This study aids Malaysia's efforts to go cashless by illuminating the role that consumers' trust plays in encouraging the use of electronic wallets.

Keywords: Continuance intention, e-wallet usage, rural youth, technology acceptance model (TAM), Malaysia

INTRODUCTION

Cash and checks were the most common forms of payment sixty years ago; however, their use is becoming less common as a result of the proliferation of alternative payment methods that are more time and cost-effective, such as general-purpose payment cards (Mohd Amin et al., 2022; Zandi et al., 2016). The movement towards cashless transactions started in the 1990s, spurred by the expansion of electronic banking and the introduction of digital wallets by firms like Apple. The tendency became even more pronounced in the 2010s when it was further accelerated by the widespread use of online banking and NFC payments, revolutionizing how transactions were carried out (Kumari & Khanna, 2017). The ever-increasing availability of Internet connectivity was a critical factor that played a vital part in streamlining the online payment process and supporting the spectacular expansion of e-commerce. E-wallets have significant momentum, becoming a popular alternative for consumers looking for simplicity and safe transactions. Among the numerous digital payment methods, e-wallets garnered the most interest.

E-wallets are now one of the most popular forms of cashless payment, with over 2.8 billion users globally (Esawe, 2022). This represents over 60 percent of the total population of the globe. By the end of 2025, this number is anticipated to have increased by 74 percent (Boku, 2021; Mohd Amin et al., 2022). More than 98 million people in the United States use prominent electronic wallet services such as Facebook Messenger, Google Wallet, and Venmo because they are more convenient than traditional payment methods such as cash (Chow, 2021). Meanwhile, in Malaysia, electronic wallets have witnessed tremendous

development, with 53 different e-wallets now accessible (Gomes, 2020). This growth is backed by the efforts of the Bank of Malaysia to promote cashless transactions.

Malaysian youth, in particular, have shown a high frequency of using e-wallets, which is encouraged by government incentives such as delivering RM150 in public incentives through various electronic wallets (Bernama, 2022). E-wallet use among youth is further encouraged by the e-Pemula program, which aligns with Malaysia's long-term goal of achieving a cashless society (Jalil, 2022). This includes youth living in smaller towns. However, although use e-wallets in large numbers, there is a dearth of study about their willingness to utilize these platforms throughout their lifetimes (Sarmah et al., 2020). There has been a decrease in the proportion of rural youth who are interested in using e-wallets, and hence, there is a need to analyse the efficacy of e-wallets in daily transactions (Chawla & Joshi, 2020; Grover et al., 2019).

This current study intends to fill the gaps by concentrating on rural youth, who use the Internet at a greater rate than older generations (Teo et al., 2020). Retaining rural youth as existing customers is critical for e-wallet platforms because they may transfer to other service providers without paying costs (Abbasi et al., 2022). Understanding rural youth retention intentions towards e-wallets is critical since maintaining current consumers is less expensive than gaining new ones (Gao & Waechter, 2017). Hence, this current study aims to contribute significant insights for the industry and help the growth of cashless payment systems by examining the variables impacting rural youth's continued intention towards e-wallets.

Furthermore, the lack of empirical studies specifically highlighting the continuance intention of e-wallet usage (CIEU) is evident despite the extensive application of the Technology Acceptance Model (TAM) in previous research on digital usage (Khoirun & Solekah, 2022). Previous studies, such as that by Chelvarayan et al. (2022), have utilized TAM to investigate the continuance intention of youth towards e-wallets. TAM stands out as one of the most frequently used variables and a crucial element in analyzing the impact of e-wallet usage. However, an aspect that previous research has not thoroughly explored is the role of trust as a mediator in the relationship between perceived usefulness, perceived ease of use, and the CIEU. Privacy and security concerns present significant obstacles to online transactions, making trust a critical factor influencing users' willingness to share personal information and credit card details with vendors. Trust, especially in the context of online interactions, plays a pivotal role (Istanbulluoglu & Sakman, 2022).

Despite the extensive use of the Technology Acceptance Model (TAM) in prior studies on digital use, there is a noteworthy shortage of research concentrating explicitly on the intention to continue using e-wallets (Khoirun & Solekah, 2022). TAM has already been used in research, such as that done by Chelvarayan et al. (2022), to explore the persistent intention of e-wallet use, especially among rural youth. TAM is one of the most often utilised variables and a critical component in analysing the effect of e-wallet usage. However, the previous study did not thoroughly investigate the function of trust as a mediator in the link between perceived usefulness, perceived ease of use, and CIEU. Concerns about privacy and security represent substantial barriers to online purchases, with trust playing a critical role in customers' willingness to provide personal information and credit card data to vendors, particularly in online transactions (Istanbulluoglu & Sakman, 2022). As a consequence, the following two key research issues are addressed in this study:

Do perceived utility, perceived ease of use, and trust have a significant impact on CIEU among Malaysian rural youth?

To what extent does trust mediate the relationship between perceived usefulness, perceived ease of use, and the CIEU among Malaysian rural youth?

LITERATURE REVIEW

Hossain et al. (2018) argue that the continuance intention of e-wallet usage (CIEU) is a conscious and observable behaviour towards using e-wallets. The positive experiences rural youth have had with the e-wallet service are what motivates them to continue using it. As a fast-growing and efficient form of transaction, e-wallets have seen a surge in popularity in the wake of the recent COVID-19 epidemic (Inan et al., 2021). Due to the setting, it is now more important than ever to look at the literature around CIEU rather than just e-wallet usage (Ooi et al., 2018). Although keeping rural youth as e-wallet users might have long-term advantages, doing so has proven difficult because of the low switching costs involved.

Changing service providers doesn't cost anything more for rural youth (Abbasi et al., 2022). In developing countries, where digital currency is still in its infancy, and the CIEU idea is still mostly uncharted, this presents a particularly difficult problem, especially for young people in rural areas. The reasons impacting e-wallet use among rural youth in developing countries are complex, and addressing the insufficient depth of previous research on the CIEU is crucial to gaining a thorough knowledge of these aspects. Insight into and analysis of these variables may lead to improvements in e-wallet services' ability to attract and keep users from rural areas (Yuan et al., 2019).

Using the TAM, earlier research (Sarmah et al., 2020) studied the variables that influence the CIEU among young people living in rural areas. Another research that used TAM to explore the desire to continue using mobile health applications came to the conclusion that a person's level of enjoyment, perceived usefulness, perceived ease of use, and confirmation of expectations all had a significant influence on the individual's level of motivation to continue using the apps. This result is consistent with the rising trend of e-wallet use as a substitute for conventional payment methods, enabling the ease of cashless transactions without the need to carry cash or credit cards (Yanget al., 2021). This earlier research evaluated the continuing intention of different users, especially rural youth, in using e-wallets by using the TAM. This conclusion was validated by the fact that TAM is in widespread use and is regarded as an essential framework for analyzing the impact of e-wallet utili (Chelvarayan et al., 2022).

Previous research that was carried out by Sarmah et al. (2020) studied this issue by utilising the TAM. TAM was used to explore the CIEU among rural youth, and the results of this investigation provided light on the essential drivers that influence rural youths' CIEU. Using the findings of TAM's successful examination of technology acceptance as a starting point, another study investigated the desire to continue using mobile health apps. The findings of this study revealed that factors such as happiness, perceived usefulness, perceived ease of use, and confirmation of expectations significantly influenced the users' intention to continue using the apps. This observation is consistent with the growing trend towards the usage of electronic wallets as a contemporary alternative to more conventional means of making payments. E-wallets eliminate the need to carry actual currency or credit cards, which is one factor that has led to their increasing popularity (Yanget al., 2021).

It was appropriate for the previous research to use this well-established model to analyse the CIEU across diverse user groups, including rural youth, given the success of using TAM to explore continuance intention in various user settings, including mobile health apps. TAM has been extensively embraced as a key paradigm in the area of technology acceptance, and it gives useful insights into consumers' attitudes and behaviours towards embracing new technologies like e-wallets (Chelvarayan et al., 2022). A more in-depth knowledge of the variables affecting the CIEU among rural youth will surely lead to an improvement in the design and use of e-wallet services as research in this field continues to advance. Furthermore, it may give significant direction for policymakers and industry stakeholders in the process of creating focused strategies to maintain rural youth as pleased and long-term users of e-wallets in emerging countries. We are able to provide an environment for digital payments that is more user-friendly, inclusive, and streamlined by continually building on the insights gathered from research such as these.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) has developed into an essential structure for understanding user's perspectives and actions concerning the introduction of novel technologies. It investigates the elements that influence user perceptions and how likely they are to adopt technological advancements. The perceived usefulness (PU) and the perceived ease of use (PEOU) are at the heart of TAM, centring on these two crucial components. The term "perceived usefulness" relates to the users' views on the degree to which they believe a specific technology may improve their performance or provide them advantages in their daily lives. It is more probable that people will have a favourable opinion of technology and, as a result, will embrace it if they believe that it benefits them and can efficiently handle their requirements. E-wallets, for example, may be seen by users as alternatives to conventional payment methods that are more convenient, save consumers time, and provide higher security.

Conversely, consumers' impressions of how straightforward it is to engage with and operate the technology are related to what is known as "perceived ease of use." Users are more likely to accept a technology if they can use it relatively quickly. E-wallets that provide user-friendly interfaces and navigation that are easy to understand have a greater chance of attracting new customers and keeping the ones they already have, especially those consumers who may need to be more computer-aware. The users' trust in their abilities to make good use of the technology is boosted when they have the impression that it is simple to use, increasing their desire to keep using it.

In the context of e-wallets, the relationship between PU and the desire to use the technology persistently has been well-established in several research. For instance, earlier studies on e-textbooks, service providers, and mobile wallets consistently show that when users view these technologies as highly beneficial, they are more likely to retain their use over time. E-wallets are not an exception; in fact, the PU of e-wallets is a significant factor behind users' intent to continue using them as their primary form of payment. Additionally, the influence of PEOU on users' desire to constantly use e-wallets is an essential component to consider, particularly concerning youth. The younger generation often prioritises ease of use and effectiveness in technological design. Therefore, when e-wallet apps are simple and quick to use, it boosts millennials' pleasant experiences, encouraging their loyalty and ensuring that they remain engaged with the platform continuously.

Perceived Usefulness, Perceived Ease of Use, and Trust

According to Kallanmarthodi and Vaithyanathan (2012), perceived usefulness (PU) is a central and fundamental notion within the TAM, which focuses on how users evaluate the ability of a technology to aid them in carrying out certain activities or attaining desired results (Kallanmarthodi & Vaithyanathan, 2012). In essence, it shows the user's conviction in the real advantages that technology may provide and the capacity of technology to boost the user's performance on a given activity. Regarding e-wallets, PU focuses on how customers evaluate the benefits that may be gained by using these digital payment platforms instead of more conventional modes of payment. When users honestly think that e-wallets provide significant advantages, such as convenience, time savings, better security, and possible cost savings, they are more likely to accept and continue using e-wallets. The perception of PU may be dramatically influenced by emphasizing the real-world benefits and advantages to users. This can encourage a greater adoption rate and use that to maintain over time.

The term "perceived ease of use" (PEOU) refers to the user's impression of how straightforward and user-friendly it is to apply a given piece of technology to a particular set of activities or chores (Huang & Ren, 2020; Rivera et al., 2015). When discussing electronic wallets, PEOU refers to the degree to which users believe they can easily browse an e-wallet and complete transactions with relatively. It is a significant predictor of user adoption and CIEU. Users who discover that electronic wallets are simple to use are more inclined to accept their usage and incorporate them into their lives regularly. As a consequence, companies that supply e-wallets have to prioritise the design and development of user interfaces that are easy to understand, uncomplicated, and need only a little work to support flawless interactions. The improvement of PEOU promotes a pleasant user experience, which in turn supports a feeling of comfort and confidence among users, which, in the long run, leads to increased adoption rates and continued use.

According to Zhou (2013), trust (TR) plays an essential part in how users evaluate the dependability, integrity, and safety of the services and technologies provided by a particular supplier. In electronic wallets, TR refers to the user's confidence in the e-wallet provider's capacity to protect the user's personal and financial information and make transactions as secure as possible. According to the findings of several studies, TR may

play the role of a mediator in the interaction between PEOU and CIEU, especially among rural youth. This suggests that TR contributes to explaining why PEOU affects the desire to CIEU. For instance, if rural youth believe that electronic wallets are pleasant to users and easy to use, their confidence in the company that provides the e-wallet may improve.

According to Ur-Rehman et al. (2020), greater levels of TR may increase individuals' long-term intentions to use electronic wallets. E-wallet service providers must, thus, prioritise the development and upkeep of trust among rural youth to encourage uptake and continued use of their products. According to Namahoot and Jantasri (2022), some methods that may assist in creating and strengthening confidence in the e-wallet service include transparent security measures, clear privacy rules, and timely customer care. These are some of the techniques that can ensure a favourable user perception and long-term commitment to utilising the platform.

Hypotheses Development and Research Framework

Individuals' confidence that a technological system would improve their performance is represented by their PU (Vaithyanathan, 2012). Previous research has shown that when exposed to and acquainted with e-wallet use, rural youth report high satisfaction levels and a significant propensity to continue using these digital payment systems (Lee, 2018). The PU of mobile services has also been substantially impact the likelihood that people would utilise mobile applications (et al., 2015). Similarly, studies on health apps have shown that PU directly influences consumers' propensity to keep using them (Huang & Ren, 2020). Users, especially rural youth, are encouraged to embrace and utilise e-wallets because of the constant data confirming the value of PU in this environment.

Multiple studies have shown a significant correlation between PU and CIEU among young people living in rural areas. If young people in rural areas see e-wallets as beneficial, they are likelier to adopt and maintain their usage of these services (Lee, 2018). This viewpoint stems from the fact that users knowing the many advantages of e-wallets that are unavailable via more conventional payment channels. This provides a strong argument for switching over and keeping with this new payment option. E-wallets, which remove the need to carry cash or visit an ATM or bank in person, seem more appealing to young people living in remote areas. E-wallets' added security measures, such as fingerprint or face recognition identification and encryption, also help build users' confidence in the technology. E-wallets' attractiveness is boosted by the possibility that they come with cashback incentives and discounts.

The usefulness of e-wallets will significantly contribute to their continued adoption and usage of these digital payment platforms, given the consistent evidence of the PU's influence on the CIEU among rural youth. Understanding the reasons driving the prolonged use of e-wallets across diverse user groups, especially rural young, is vital for policymakers and e-wallet providers as technology advances and e-wallets become more interwoven into everyday life. The industry should do more to encourage the broad adoption and long-term success of e-wallets by highlighting the benefits of using them and providing a user-friendly experience. Therefore, we hypothesised that:

H1 PU and the CIEU among rural youth are positively related

Individuals' impressions of technology's user-friendliness are referred to as "perceived ease of use" (PEOU) in the Technology Acceptance Model (TAM) framework (Vaithyanathan, 2012). When people are hesitant to accept a technology despite its advantages because of how difficult or sophisticated it is to use, PEOU becomes an essential factor. The perceived utility of mobile apps has been shown to play a crucial role in encouraging regular e-wallet use among rural adolescents (Abbasi et al., 2022). PEOU's value comes from the fact that it can determine how easy and helpful e-wallets are to use daily (Chelvarayan et al., 2022). Therefore, the effect of PEOU on CIEU is understandable when utilising e-wallets takes little to no effort and provides a service-oriented experience.

Aiming to use e-wallets routinely is strongly correlated with PEOU, especially among youth from rural regions. This preference stems from the widespread notion that using an e-wallet is quick, easy, and has a little learning curve. Providers of electronic wallets may undertake user testing and collect feedback to learn about users' positive and negative experiences. Providing rural youth with ongoing user education and assistance may also go a long way towards making them feel at ease while using e-wallets. Examples of ways in which PEOU may be improved include the implementation of precise navigation and transactions. Youth in rural areas may have a more favourable impression of the convenience of e-wallets if they are provided with clear and accessible customer service, and interactive manuals and lessons. E-wallet providers may encourage increased acceptance and sustained use among rural youth, leading to greater financial inclusion and empowerment in developing countries by consistently focusing on increasing PEOU and addressing user demands. Thus, our next hypothesis is advanced as follows:

H2 PEOU and the CIEU among rural youth are positively related

A user's propensity to use technology because of optimistic anticipation and the conviction that it would fulfil their requirements and expectations is significantly influenced by trust (Zhou, 2013). Continuous use of services, such as e-wallet payment systems, has been linked to high levels of trust in several countries, including Thailand, China, the United States, and India (Ur-Rehman et al., 2020). Consumers are more likely to use e-wallets as their primary payment method if they have reason to believe their financial data is safe and secure in the digital environment. The importance of trust in promoting technology adoption and use has been underlined by previous research showing that low levels of trust might lead to decreased consumer technology use.

Trust links favorably with rural youth's inclination to use e-wallets (Madan & Yadav, 2016). Young people in rural areas are more likely to continue using e-wallet services if they have confidence in the companies providing them. E-wallet users believe in these companies because they think they will keep their money safe, secure their data, and respond quickly to customer service requests (Madan & Yadav, 2016). If e-wallet companies want to keep rural youth using their services, they need to work to earn their confidence. Users would feel more at ease sharing personal information if given clear and regular updates on the security and privacy precautions. E-wallet service providers may better serve the needs of young people in rural areas and promote greater financial inclusion in developing countries by placing a premium on trust-building tactics. With e-wallets and other digital technologies, youth in rural areas and beyond may gain economic independence and enjoy a streamlined user experience. Therefore, the following hypothesis is developed:

H3 Trust and the CIEU among rural youth are positively related

When adopting and using new technology, trust is a vital factor that bridges the gap between users' intentions to utilise the technology and their actual adoption and adoption (Shaw, 2021). This demonstrates the importance of trust as a moderating element in people's decisions to accept new technologies. Trust is the most crucial aspect consumers consider when deciding whether or not to accept and use electronic wallets (Trivedi & Yadav, 2020). Their confidence strongly influences users' commitment to an e-wallet service in the security of that service. Trivedi and Yadav (2020) studied young Indians and found that trust was a critical mediating variable between the two constructs—the users' desire to use e-wallets and their opinion of using e-wallets. This demonstrates the dual role trust plays as a direct influence on users' adoption choices and as a mediator of their CIEU.

Users' intentions to use e-wallets are deeply influenced by their confidence in the system, highlighting the vital role of trust in determining the sustainability of e-wallet transactions. Users need to feel safe and secure using e-wallets trust their dependability and privacy settings before using them as their primary payment method. Users are likelier to continue using an e-wallet service if they have a positive impression and feel safe making financial transactions. Building trust should be at the centre of the techniques used by e-wallet providers to increase adoption and usage across a broad range of user groups, particularly

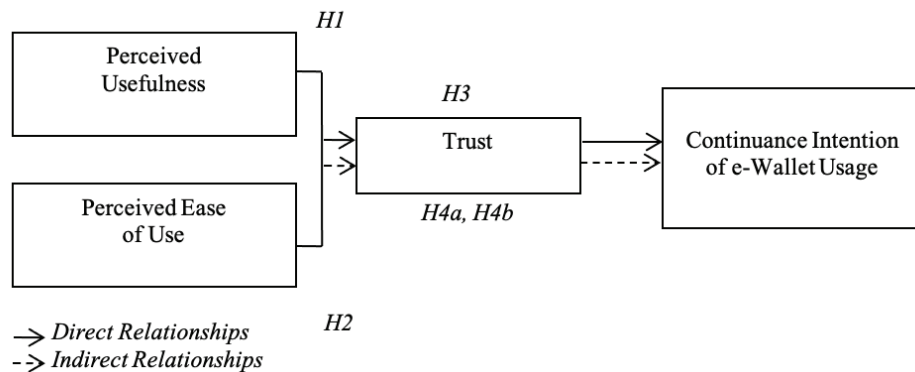
young people and people in developing countries. Users are more likely to be committed to a service that has earned their trust via open dialogue, solid security precautions, and consistent assistance from support staff. The broad acceptance of e-wallets and the advent of a digitally empowered society are both propelled users' trust in the system's reliability. Therefore, these hypotheses are put forward:

H4a Trust mediates the relationship between PU and the CIEU among rural youth

H4b Trust mediates the relationship between PEOU and the CIEU among rural youth

Figure 1

Proposed Research Framework



METHODOLOGY

Survey and Procedure

This study's main goal was to investigate the relationships between Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Trust (TR), and Continuance Intention of E-Wallet Use (CIEU) among Malaysian rural youth. A self-administered questionnaire was carefully constructed, adhering to clarity, conciseness, and impartiality, to collect accurate and valid data (Brantet al., 2015). A deliberately constructed questionnaire was created in English and Malay, and the replies were rated on a five-point Likert scale, with 1 being (strongly disagree) and 5 (strongly agree). To reduce time, money, and maintain a high degree of data accuracy, non-probability purposive sampling was selected as the sampling technique (Cooper & Schindler, 2003). To guarantee that data collection aligns with the investigation's goal of examining CIEU, rural youth between 15 and 40 years old of all ages, genders, and races who live in low-level urbanisation regions were carefully selected for this study.

This study collected data from September 2022 until January 2023. In September, the Ministry of Rural and Regional Development held an official meeting to obtain approval for the selected community centre. Following the approval, the management of Pusat Komuniti Desa (PKD) was called to go through the objectives of the research and the procedure for gathering data. Before conducting data collection, respondents were given a written agreement and a short explanation of the study to ensure they would comprehend and comply with the study. A large number of PKD designated by the Ministry of Rural and Regional Development made the East Coast area (Pahang, Kelantan, and Terengganu) the study's specific target population for rural youth. There were 66 PKDs in all, and each was given ten sets of questionnaires. A virtual online platform was effectively used to gather data.

Variables and Measures

In this study, the questionnaire items for PU were adapted from Halimet al. (2021). Utilizing a five-point Likert scale, the internal consistency of the PU items was assessed using Cronbach's Alpha, resulting in an impressive value of 0.934. Similarly, the items for PEOU

were adapted from the study conducted by Halim et al. (2021). The reliability of the PEOU items was confirmed through Cronbach's Alpha, yielding a commendable value of 0.927. For Trust, the study drew from the research conducted by Bhattet al.(2021) to adapt the relevant items. Utilizing the same five-point Likert scale, the trust items' internal consistency and reliability were measured through Cronbach's Alpha, resulting in a robust value of 0.929.

Furthermore, CIEU items were derived from the work of Karim et al. (2022). Participants' responses to the CIEU items were assessed using a five-point Likert scale. The internal consistency of the CIEU items was evaluated using Cronbach's Alpha, resulting in a commendable value of 0.903.

Data Analysis

For evaluating the established hypotheses, the current study utilized SmartPLS 3.2.8, a Partial Least Square Structural Equation Modeling (PLS-SEM) methodology. PLS-SEM estimates composite variables to illustrate underlying factors in the route models (Hair et al., 2017). This method works well for examining data that does not fit the normal distribution, has a small sample size, or is part of a formative assessment (Urbach & Ahlemann, 2010). In this investigation, we used a two-stage PLS-SEM procedure to independently evaluate the measurement and structural models. Five hundred samples were used as respondents in the study. Internal consistency, indicator reliability, convergent validity, discriminant validity, and multicollinearity of the measurement model were all checked during model validation to confirm the model's reliability and validity. Several measures were used to assess the PLS-SEM structural model's explanatory and predictive power, including the coefficient of determination, effect size, path coefficient, predictive relevance, and relative impact.

RESULTS

The data analysis in this research started using IBM SPSS Version 29, followed by the Smart-PLS software. A total of 500 questionnaires were received, and the dataset had no missing values, suggesting that all respondents submitted complete answers to all questions. 71.4 percent of rural youth responders were female. Most participants (50.6 percent) were between the ages of 21 and 25, and the ethnic makeup was mainly Malay (92.6 percent). Pahang had the most significant presence among the states, with 38.6 percent of respondents. Furthermore, 46.2 percent of those polled had a bachelor's degree as their highest academic attainment. In terms of employment, 32.0 percent of those polled were unemployed. Regarding occupation, 32.0 percent of respondents were unemployed, and most household monthly earnings ranged from RM1,000 to RM2,000, as shown in Table 1.

Table 1

Demographic profiles (n=500)

Items	Frequency	Percent
Gender		
Male	143	28.6
Female	357	71.4
Age		
15-20	62	12.4
21-25	253	50.6
26-30	68	13.6
31-35	54	10.8
36-40	63	12.6

(Continued)

Items	Frequency	Percent
Ethnicity		
Malay	463	92.6
Chinese	21	4.2
Indian	15	3.0
Bidayuh	1	0.2
Marital Status		
Married	161	32.2
Divorce	5	1.0
Never Married	334	66.8
State		
Kelantan	138	27.6
Terengganu	169	33.8
Pahang	193	38.6
Highest Academic Qualification		
No formal education	1	0.2
UPSR	1	0.2
SPM/SPMV/SMA	96	19.2
Certificate	13	2.6
PT3/PMR/SRP	5	1.0
Matriculation/Foundation/STPM/STAM	23	4.6
Diploma	126	25.2
Bachelor's degree	231	46.2
Master's degree/MBA	4	0.8
PhD	-	-
Profession		
Unemployed	160	32.0
Self-employed	66	13.2
Non-Governmental Organization	11	2.2
Private Sector	155	31.0
Government Sector	108	21.6
Household Monthly Income		
No income	51	10.2
Below RM1,000	49	9.8
RM1,001-RM2,000	141	28.2
RM2,001-RM3,000	131	26.2
RM3,001-RM4,000	37	7.4
RM4,001-RM5,000	27	5.4
RM5,001-RM6,000	20	4.0
RM6,001-RM7,000	7	1.4
RM7,001-RM8,000	4	0.8
RM8,001-RM10,000	10	2.0
RM10,001-RM20,000	16	3.2
RM20,001 and above	7	1.4

Measurement Model Assessments

The IBM SPSS 29 statistical software was used in this study to compute the average and standard deviation of the data. Confirmatory Factor Analysis (CFA) was used to assess the items' reliability, convergent validity, and discriminant validity. Loadings, composite reliability (CR), and average variance extracted (AVE) methodologies proposed by Hair, Black, Babin, and Anderson (2010) were used to test convergent validity. Table 2 shows that the item loadings exceeded the specified limit of 0.5. Furthermore, all of the constructs investigated had CR values greater than 0.70, which met the threshold established by Nunnally (1978) and Gefen et al. (2000). Notably, the AVE values were equivalent to or greater than the 0.5 criterion indicated by Bagozzi and Yi (1988). As Fornell and Larcker (1981) emphasise, the underlying latent variables account for more than half of the variation in the overt measurements.

Tables 2

Convergent validity of the reflective items in the measurement model

Construct/Items	Loadings	CR ^a	AVE ^b
Perceived Usefulness (PU)			
Using e-wallet enables me to do transactions more quickly (PU1)	0.90	0.97	0.85
Using e-wallet makes doing my transactions easier (PU2)	0.93		
Using e-wallet enhances the effectiveness of my transactions (PU3)	0.94		
Using e-wallet would improve the quality of the transactions performed (PU4)	0.92		
Using e-wallet would be useful for my transactions (PU5)	0.92		
Perceived Ease of Use (PEOU)			
Learning to operate e-wallet is easily for me (PEU1)	0.86	0.94	0.77
I find e-wallet easy to use (PEU2)	0.91		
Interaction with e-wallet does not require a lot of mental effort (PEU3)	0.83		
My interaction with e-wallet is clear and understandable (PEU4)	0.90		
I find it is easy to use e-wallet to do what I want (PEU5)	0.89		
Trust (TR)			
I trust transaction happening through e-wallet platforms (TR1)	0.85	0.91	0.72
I trust that providers of e-wallet platforms will not divulge any information to third party (TR2)	0.79		
I believe that in any case of e-wallet platforms, service provider will provide assistance (TR3)	0.89		
I believe all e-wallet platforms follow law (TR4)	0.85		
Continuance Intention of E-wallet Usage (CIEU)			
I intend to continue e-wallet in future (CIEU1)	0.93	0.95	0.86
I intend to increase my e-wallet usage in the future (CIEU2)	0.92		
I will keep using e-wallet as regularly as I do now (CIEU3)	0.93		

The constructs' discriminant validity was assessed using the heterotrait-monotrait correlations (HTMT) criteria. Henseler et al. (2015) claim that HTMT is more sensitive than the traditional Fornell-Larcker criterion in identifying discriminant validity difficulties. The HTMT results, shown in Table 3, show that none of the correlations between constructs exceeded the HTMT.90 threshold. This suggests that the HTMT.90 criterion was not surpassed, indicating that the HTMT.90 threshold was not exceeded.

Tables 3

Heterotrait-monotrait (HTMT) results

Constructs	CIEU	PU	PEOU	TR
CIEU				
PU	0.75			
PEOU	0.72	0.85		
TR	0.68	0.53	0.47	

This study used SPSS (version 29) and SmartPLS (version 4.0) tools to analyse the data. The PLS method described by Hair et al. (2010) was used to get the best results for the explained variance of the dependent latent variables. Based on internal consistency reliability, indicator reliability, convergent validity, and discriminant validity, the measuring model was reviewed and analysed. Hair et al. (2012) describe a two-stage PLS-SEM method used to test this work’s assumptions. The measurement model was evaluated in the first stage, and in the second stage, the structure model was evaluated. Both parametric and non-parametric bootstrapping methods were used to determine how statistically significant each route link was for testing the theory.

Structural Model Assessments

The study examined several hypotheses to investigate the relationships between PU, PEOU, TR, and CIEU among rural youth. H1 proposed a significant positive relationship between PU and CIEU, supported by the results ($\beta=0.246, t=4.582, p\text{-value}=0.000$). Similarly, H2 suggested a positive relationship between PEOU and CIEU, which was also confirmed ($\beta=0.237, t=4.354, p\text{-value}=0.000$). H3 proposed a positive relationship between TR and CIEU, and this relationship was statistically significant ($\beta=0.282, t=5.074, p\text{-value}=0.000$). PU, PEOU, and TR together explained 63.0 percent of the variation in CIEU among rural youth ($R^2=0.630$).

To explore the mediation hypotheses, mediation analysis was conducted using SmartPLS 4.0, a well-established method for investigating relationships between variables (Cohen, 1988; Hair et al., 2010). The bootstrapping technique evaluated the mediation effects (Preacher & Hayes, 2004). The findings revealed significant mediations for $PU \rightarrow TR \rightarrow CIEU$ ($\beta=0.040, p=0.032$) and $PEOU \rightarrow TR \rightarrow CIEU$ ($\beta=0.040, p=0.000$). The confidence intervals for PU and PEOU did not include zero after correcting for bias, indicating credible results. Thus, hypotheses H4a and H4b were supported. Detailed results and route coefficients are provided in Table 4, and Figure 2 visually represents these coefficients.

Tables 4

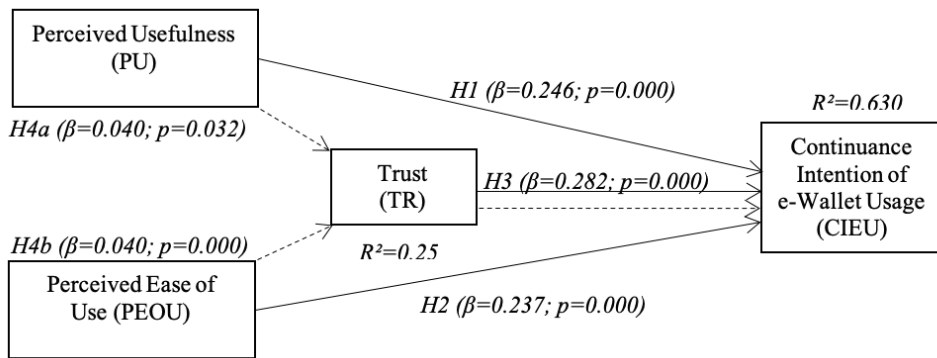
Path coefficient and hypotheses testing

Hypotheses	Relationships	t-Value	p-Value	Decisions
H1	PU \rightarrow CIEU	4.582	0.000	Accepted
H2	PEOU \rightarrow CIEU	4.354	0.000	Accepted
H3	TR \rightarrow CIEU	5.074	0.000	Accepted
H4a	PU \rightarrow TR \rightarrow CIEU	2.715	0.032	Accepted
H4b	PEOU \rightarrow TR \rightarrow CIEU	4.229	0.000	Accepted

Notes: PU- Perceived Usefulness; PEOU-Perceived Ease of Use; TR-Trust; CIEU- Continuance Intention of E-wallet Usage

Figure 2

Results of the Path Coefficient



DISCUSSION

The purpose of this study was to investigate the relationships that exist between perceived usefulness (PU), perceived ease of use (PEOU), trust (TR), and continuance intention of electronic wallet use (CIEU), as well as the function that trust plays as a mediator in these relationships. Building on earlier work done by Filona and Misdiyono (2019) and Manis and Choi (2019), the emphasis of this study was on e-wallets, which have gained popularity among young people living in rural areas since they can be integrated into mobile phone apps and may provide users with access to a variety of multimedia and entertainment functions.

The results of this study indicated a strong and favourable relationship between TR and the desire of rural youth to continue using e-wallets in their day-to-day lives. This link was between TR and rural youth's desire to continue using e-wallets. It became clear that TR was essential in people's decisions to embrace new technology. Enhancing PU and PEOU, which in turn encourage the desire to use e-wallets continuously, may be accomplished by increasing TR as a mediator and aligning e-wallet characteristics with users' lives, according to previous study findings. In addition, increasing the availability of electronic wallet services in rural regions might arouse the interest of young people in rural areas in adopting new technologies (Wong, 2022). On the other hand, it was found that rural youth saw e-wallets as sophisticated technology that was difficult to understand, which made it difficult for them to use.

The study's findings provided evidence in favour of all five hypotheses, pointing to significant correlations between PU, PEOU, TR, and CIEU among rural youth in Malaysia. These results add to a better knowledge of the variables driving this group's adoption of electronic wallets. TR has a crucial role as a mediator in this process. Notably, both PU and TR were shown to directly influence the intention of rural youth in Malaysia to keep using e-wallets, which is notable since both factors were found to have the same effect. Consequently, there is a significant possibility of boosting CIEU among young people living in rural areas via the adoption of relevant policies and guidelines. A strong CIEU among rural young may provide long-term advantages for Malaysia's national economy and society, including simplified transactions and fewer instances of theft. Thus, this development is especially favourable for Malaysia's path towards a cashless society. This improvement is constructive for Malaysia's journey towards a cashless society.

This research significantly contributes to our understanding of CIEU among rural youth in Malaysia. The study builds on the work of Filona and Misdiyono (2019) and Manis and Choi (2019) to highlight the growing popularity among rural youth of e-wallets that interact with mobile phone apps and provide access to various multimedia and leisure options. Trust has been shown to have a crucial role in encouraging people to adopt new technologies, and this research highlights the significant relationship between trust and the continuous usage of e-wallets by rural adolescents. The results also highlight the significance of improving

trust as a mediator and adapting e-wallet features to suit individual needs, which may increase the wallet's PU and PEOU and encourage regular use.

CONCLUSION

The practical consequences of the research are substantial for various stakeholders in Malaysia, including policymakers, service providers, and educators. These results give valuable insights that may be used to drive strategic initiatives and policies targeted at increasing the CIEU among rural youth. For Malaysian policymakers, the research emphasises the critical significance of PU and trust in influencing rural youth's willingness to use e-wallets consistently. Policymakers may use this information to develop targeted policies and recommendations to encourage an environment favourable to higher e-wallet use. For example, they may create digital financial literacy programmes geared exclusively toward rural youth, equipping them with the skills and information needed to use e-wallets and participate in the digital economy properly. Such programmes have the potential to bridge the digital gap and increase financial participation within this generation.

Furthermore, the study emphasises the importance of trust-building measures in improving CIEU. Policymakers may endeavour to build and promote transparent and safe e-wallet services, giving rural youth the confidence to adopt these digital payment alternatives. Addressing trust issues and guaranteeing data security may lead to higher adoption rates and lower fear among rural adolescents. The study's findings are helpful for e-wallet service providers in adapting their platforms better to meet the tastes and interests of rural youth. Educators may also be essential role in encouraging rural adolescents to use e-wallets. By including digital financial literacy programmes in the curriculum, educators can provide young people with vital financial management skills and digital fluency, equipping them to navigate the digital financial world comfortably. Educators may engage with service providers to provide interactive seminars, training sessions, and simulations that give students hands-on experience with e-wallets, boosting their practical understanding.

This study adds to the TAM's development by investigating the CIEU phenomenon among rural youth in Malaysia. The study's findings provide credence to the importance of the perceived utility and perceived ease of use characteristics within this target audience and expand the TAM framework's adaptability as a result. The research also shows that trust is a critical moderator of the relationships between e-wallet users' perceptions of their utility, convenience, and likelihood to keep using them. Insight on the importance of trust in driving customers' decisions to stick with e-wallets over time would improve the TAM's grasp of the psychological dynamics behind technology adoption. By focusing on teenagers in rural Malaysia, this study admits that cultural factors might affect people's opinions, preferences, and trust assessments when using electronic wallets. This understanding highlights the need for study on the acceptability of technology to account for cultural issues.

Despite its merits, the study contains certain limitations that should be considered. The study has several flaws, the most glaring being its overreliance on data from only one institution (Pusat Komuniti Desa, or PKD). Therefore, the results may have limited applicability to other institutions and nations. Future research would benefit from using various cultural, socioeconomic, and demographic groups as samples to increase generalizability and relevance. A larger view like this would provide a more complete picture of e-wallet use across demographics. Furthermore, future studies should include other relevant characteristics to acquire a better understanding of CIEU, particularly among rural youth, given the ever-evolving complexity and altering expectations of user behaviour. Investigating users' happiness levels with their experience using e-wallets is crucial because it may shed light on the attitudes and incentives that drive youth in rural areas to embrace keep using technology.

TAM was used to examine how PU, PEOU, and trust influence the CIEU among rural youth in Malaysia. Future studies should examine motivating (hedonic and utilitarian) and

inhibitory (anxiety and emotional) perceptions to understand rural adolescent adoption decisions better. The Big Five Personality Traits, the Theory of Planned Behaviour, and the Unified Theory of Acceptance and Use of Technology (UTAUT) can help future studies understand CIEU among rural youth. These frameworks may illuminate the factors affecting e-wallet adoption in this demographic, improving our knowledge of their technological acceptance behaviour.

Gender is a significant factor in many people's plans for keeping up with their gadgets; thus, looking at possible moderators might help shed light on the dynamics at play. Interventions to increase the use of electronic wallets may be more targeted and successful if they consider these moderators. Last but not least, although the present study used a quantitative technique with a more significant sample, it might be supplemented with qualitative methods to understand respondents' experiences better and capture phenomena beyond numerical measures. Researchers may get more profound and more complex insights into consumers' motivations, emotions, and perceptions using qualitative approaches like interviews and focus group discussions. Combining quantitative and qualitative methods gives a complete picture of what drives e-wallet use among rural youth.

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PERSPECTIVE OF POLICYMAKERS ON QUANTUM COMMUNICATION TECHNOLOGY (QCT) PRACTICE IN MALAYSIA: A FOCUS GROUP DISCUSSION

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ABSTRACT

With the rise of cybercrime, which poses a significant risk to national safety and well-being, today's digital cyber environment has become more challenging. In this case, cybersecurity has an important effect on national digital sovereignty and is vital to national economic prosperity. The resilience of a country in its cyber security is expected to be significantly influenced by Quantum Communication Technology (QCT). QCT is a field that applies quantum physics with quantum cryptographic applications to secure information channels against eavesdropping. Therefore, various stakeholders must understand the challenges and demands of cyber security in the Quantum era. This study analysed the academicians, industry players and policy experts in sharing their insights and views on QCT practice in Malaysia in a focus group discussion. The focus group discussion was applied in this study as a qualitative research method for exploring QCT and its impact on the cyber security landscape by bringing together industry experts and policymakers to share views and opinions. Discussions addressed the topic of (1) awareness of QCT, (2) policy agenda, (3) policy development, (4) policy implementation and enforcement, (5) issues and challenges and (6) recommendations to adopt QCT in Malaysia. The data sets collected during the discussions were analysed using content analysis. This study discovered issues and challenges of QCT adoption that should be the main concern to cater to adopting QCT policies and development. Awareness, involvement of stakeholders, good governance, talent and a dedicated task force on QCT are among the highlights of this discussion.

Keywords: Cyber security, policy, Quantum Communication Technology (QCT), Quantum Technology, security.

BACKGROUND

The physical aspect of human beings has changed in various ways, some more profound than others, as a result of today's digital world. Nowadays, almost everything in daily life is connected through a complicated network of the web and information and communications technology networks that are super advanced. With the incredible speed at which digital technology is developing, we now have quantum communication technology (QCT). Particularly, there is a significant development in the quantum cybersecurity field. The dynamic nature of the existing technological systems has been improved due to the incredible advances made possible by the ongoing developments in quantum computing in a number of different fields. QCT can process extremely complex logistics and algorithms in real time; among other things, QCT will allow us to tackle and solve critical issues relating to cybersecurity completely. The rise of cybercrime, a serious threat to the nation's security and well-being, has made today's digital environment more complex. The protection of cybersecurity is crucial to the nation's economic development and has a significant impact on its digital sovereignty. It is believed that QCT will impact how the nation strengthens its cyber security resilience.

In the case of Malaysia, it will take time for quantum technology to be widely used. Therefore, it is important for Malaysia to be concerned about the importance of adopting QCT policy and development. To have a comprehensive discussion on this particular issue, focus group discussion was considered a method of data collection. According to O. Nyumba et al. (2018), focus group discussions are often used as qualitative research to comprehend social topics comprehensively. Instead of using a representative sample based on statistical criteria of a larger population, the approach seeks to collect data from an intentionally selected number of people. Throughout a focus group discussion, researchers act as a “facilitator” or “moderator.” In this situation, the researcher acts as a facilitator or moderator of a group conversation among participants rather than between the participants and the researcher. According to Parker & Tritter (2006), focus group discussions frequently get mistaken for interviews, particularly semi-structured “one-to-one” and “group interviews”. The ability of a focus group to collect data that depends on the cooperative nature of group interaction makes it distinctive (Green et al., 2003). Green et al. (2003) explain that as a tool for qualitative research, it features group discussions to explore preferences and perceptions. In response to questions asked by the moderator, group participants interact with each other to spontaneously describe experiences and perspectives that might otherwise be difficult to capture using quantitative methods.

Thus, various stakeholders need to understand the needs and challenges of cyber security in the quantum era. This study aims to understand the development of QCT and its impact on the cybersecurity landscape by bringing together academicians, industry experts and policymakers to share perspectives and opinions through a focus group discussion.

METHODS

The focus group discussion was applied in the study as a qualitative research method for experts to share their insights and views of QCT. The qualitative research technique or the focus group discussion is where the participants were encouraged to engage in open debate; they assisted each other in expressing their opinions and understanding the main points.

To fulfil the study’s aims and better understand the content of the discussions concerning QCT policy and development, the qualitative method of focus group discussion was applied to better understand people, what they say, and what they do; qualitative research techniques are used. Observing and understanding the context in which decisions and actions are made was one of this study approach’s main advantages.

Focus groups were viewed as being more appropriate by this study compared to one-on-one interviews. According to Morgan et al. (1998), there are four steps for a focus group discussion, which include (1) research design, (2) data collection, (3) analysis and (4) reporting of results, as in Figure 1 below:

Figure 1

Four Steps of Focus Group Discussion According to Morgan et al. (1998)

Research Design	<ul style="list-style-type: none"> ● Identify the objective of the study <ul style="list-style-type: none"> ○ Define the purpose of the focus group ○ Develop a list of key questions ○ Seek ethics clearance ● Identify and recruit participants <ul style="list-style-type: none"> ○ Ensure homogenous composition (education, language, etc.) ○ Identify facilitators ● Identify suitable location <ul style="list-style-type: none"> ○ Select an accessible venue and away from distractions ○ Arrange materials (recording equipment, consent form and name tags)
Data Collection	<ul style="list-style-type: none"> ● Pre-session preparation <ul style="list-style-type: none"> ○ Moderator and facilitator familiarize with script, group dynamic, seating preferences, equipment operation ○ Record duration of each meeting ● Facilitation during meeting <ul style="list-style-type: none"> ○ Introduction of the discussion, consent form and ground rules ○ Record the discussion ○ Track questions for completion on themes of discussion ○ Conclude and acknowledge participants
Analysis	<ul style="list-style-type: none"> ● Facilitation during meeting <ul style="list-style-type: none"> ○ Conversation analysis
Results and Reporting	<ul style="list-style-type: none"> ● Decide on target audience <ul style="list-style-type: none"> ○ Academics ○ Policy makers and practitioners

In this focus group discussion, researchers bring together a group of selected people to discuss QCT and today's digital cyber world, which is becoming increasingly challenging with the emergence of cybercrime, a major threat to the security and well-being of the country. This discussion brings together academic, industry and policy experts to share their insights, views, personal experiences, beliefs, perceptions, and recommendations for QCT evolution and its impact on cybersecurity. The study objectives are then utilised to produce a set of questions (script) for the discussion session.

Setting, Participants and Methods

The study was conducted in Cyberjaya, Selangor, and the participants were all Malaysian residents representing a range of professional backgrounds. The discussion was held in the morning, and later offered the participants for refreshments and tokens of appreciation for their participation.

The exact number of participants is 18. To facilitate and encourage an open discussion, participants of the focus groups were thoughtfully selected based on selected criteria, making them comfortable addressing as many perspectives as possible. Selected criteria included academicians, IT experts, industry players and policymakers. Academicians and IT experts have professionals with a deep understanding of related subjects and knowledge of quantum physics and computer science.

After selecting potential participants, the team then contacted the participants initially by email and then by telephone. Based on their availability, this study assembled 18 participants who agreed to participate in the discussion. All participants received a document containing the meeting agenda and a list of questions to be discussed before the focus group discussions.

All participants received verbal and printed study explanations from a facilitator (researcher). All the participants asked to participate in the study agreed to the request and provided written consent to participate. A moderator was in charge of leading the focus group

discussions and asked structured questions about the topic but was permitted to modify the wording and sequence of questions to suit the natural flow of the discussion. First, the participants were asked to complete their personal details form for demographic purposes. Later, all participants completed a written consent form before the discussion and written discussion answers during the discussion. The written discussion answer form was used to obtain additional information about the discussion, particularly when participants require more time, especially when they do not have a chance to interrupt the discussion with a huge number of participants and limited time. All experts and professionals were given equal opportunity to communicate in the discussion. The setting was assembled into one group and facilitated by the team. The focus group discussions were scheduled for 1.5 - 2 hours, audiotaped, and qualitatively analysed using content analysis.

Data Analysis

The data collected during the focus group discussions were evaluated using content analysis. The audiotaped discussion was transcribed verbatim on 38 pages in length. Initially, the researcher independently analysed the transcript for accuracy and reliability through multiple readings to determine categories of responses to the discussion questions. The text's keywords, phrases, and concepts were highlighted to distinguish major ideas. This study also comprehends written discussion answers from each participant. As a result, the individual opinions which changed due to group dynamics and the group opinions expressed by the participants based on consensus were also identified.

RESULTS AND DISCUSSION

This study summarises the results of the discussions by highlighting the subsections of the discussion into six themes, which are (1) awareness of QCT, (2) policy agenda, (3) policy development, (4) policy implementation and enforcement; (5) issues and challenges and (6) recommendation to adopt QCT in Malaysia.

Theme 1: Awareness of QCT

During the discussion, 6 out of 18 participants said they already heard about QCT previously. Meanwhile, 2 out of 18 participants said they only had a general idea, and the remaining said they never heard about QCT. During the discussion, only 6 participants could explain QCT; meanwhile, the remaining either answered no or did not answer the question.

"I have heard about QCT, and what they have heard is very alarming because cybersecurity, QCT will break all the encryption. It will no longer be safe". (Policymaker)

"QCT is a technology related to quantum physics, mathematics, computer science and engineering". (Academician)

"QCT involves the application of non-trivial quantum physics such as quantum superposition, coherence, and entanglement to develop technology for communication in transmission for encryption/security". (Academician)

"QCT is not science fiction, and it is already implemented and being used today... Malaysia is in the top 5 among the quantum key distribution players". (Academician)

"QCT takes advantage of laws of quantum physics to protect data, allowing photons of light to transmit data along optical cables. Enabling to transmit a large volume of data with more advanced security applied". (Policymaker)

In this discussion, it is observed that public awareness is important because it can increase enthusiasm and support, especially to mobilise the stakeholders' knowledge and resources.

In this study, awareness of QCT is paramount, especially to the stakeholders, as there is a significant potential for global innovation, especially regarding a nation's cybersecurity.

Theme 2: Policy Agenda

In general, most participants mentioned a national policy that says specifically QCT. Still, most policymakers agree to have a policy in QCT that should be emphasised under the National Cryptography Policy (NCP). The NCP serves as a guiding document for Malaysia to achieve cryptographic sovereignty in Malaysia. In the discussion, when the moderator mentioned the existence of QCT in national/commercial security at the moment, one participant who is an academician said that the Malaysia Science, Technology, Innovation and Economy (MySTIE) once mentioned quantum. MySTIE framework provides a comprehensive approach to economic prosperity in Malaysia. In terms of the other existing document that addresses the importance of QCT, one participant who is an academician mentioned that there is a Government Public Key Infrastructure (GPKI) framework, which is an indirect reference to quantum where it cited post-quantum cryptography as something which the government public key infrastructure should have for the future. The document was developed in 2016 and owned by the Malaysian Administrative Modernisation and Management Planning Unit, which is responsible for modernising and reforming the public sector in Malaysia.

One participant who is a policymaker mentioned the Cyber Security Framework for Public Sector (RAKKSSA), ISO27001 (an international standard for the implementation of enterprise-wide Information Security Management System (ISMS)), Security Posture Assessment (SPA), and the Malaysian Public Sector Information Security Risk Assessment Methodology (MyRAM). Still, there is no quantum specifically mentioned in any of this document.

In this policy agenda, most participants answered verbally or in writing, especially the policymakers, who agreed to have a specific policy for QCT. One participant who is a policymaker mentioned the relation to Malaysia's Ministry of Higher Education (MOHE).

"The policy is a good jumpstart for the Ministry of Higher Education to work with the private or non-private educational institutions for quantum computing". (Policymaker)

"The policy must be followed by continuous implementation of activities". (Policymakers)

When it comes to how many years the government should revise the policy, one of the participants among the policymakers mentioned that it should be revised every 6 months. In this discussion, it is observed that outdated policies will put a nation at risk. The old policies may be non-compliant with the new laws and regulations, especially with new technological advancements. The policy might change due to existing certification requirements or standards. In this case, technological advancement makes the policies inadequate, ineffective, or inconsistent practice as the existing policy might not address the new technology or system.

Theme 3: Policy Development

Most policymaker participants agreed that Malaysia should refer to countries such as the United Kingdom, Singapore, Australia, China and Germany. In detail, the United Kingdom has a growing investment in its research and development, especially in terms of new innovation. In addition, the United Kingdom is also the most advanced country in the world. As for Singapore, it is one of the countries that has technological advancement in ICT worldwide. The discussion also includes the Malaysia Plan because the QCT is also in line with the 12th Malaysia Plan (an agenda for national recovery to restore economic stability and regenerate national economic growth), and the majority of the policymakers agreed that the QCT policy is important in protecting Malaysia's national security. Achieving

quantum computing capabilities is also mentioned to be an important process.

In the discussion, the moderator also discussed the main reference for QCT policy development in Malaysia. Similarly, one participant who is an academician stressed that:

“Malaysia should have a secure policy because the government policy itself is a huge area to cover”. (Academician)

One of the participants includes the National Standards Compliance Programme (NSCP) and Malaysia Science, Technology, Innovation and Economy (MySTIE) in the discussion. The importance of national documents or policies such as The Malaysia Plans and other policies developed by the Ministry. From the observation, most of the participants suggested that the existing security policy adopted by Malaysia be used for the adoption of QCT policy development.

“We can refer to the existing policy of the countries that have developed and manipulated it toward our national policy and adopted by our country”. (Policymaker)

In one part of the discussion, the study would like to measure the performance of other nations (best practices) that are considered the best in the world. Therefore, the discussion's moderator begins by asking the participants whether the benchmarking analysis is important and which countries this study should refer to. In this discussion, the majority of the participants agreed on benchmarking analysis.

“If we want the reference for Malaysia, we should look for a country that looks at it as more on the diplomatic side but is critical”. (Academician)

“Referring to other countries' policy can help us to enhance the policy develop locally”. (Policymaker)

Meanwhile, another academic participant suggested referring to the United States and the United Kingdom for the benchmarking analysis. The discussion continues with the 12 Malaysia Plan. One participant, an academician, said that QCT development is in line with the 12th Malaysia Plan because of the comprehensiveness of the strategy and initiative. By referring to the 12th Malaysia Plan, the participants believe it will be a good starting point for developing QCT policy in Malaysia.

The moderator then asked about the importance of QCT policy in protecting Malaysia's national security.

“Once we achieved quantum computing capabilities, we can decipher what is communicated, which makes it very urgent for us to have a strategy”. (Policymaker)

“It will make things much stronger in the quantum era”. (Industry player)

This statement was supported by most of the participants in both verbal and written answers. From the written answer, most academicians and policymakers mentioned that QCT policy is pertinent.

“It is very important as the policy will be the sole guide to the other agency, as it will help our national security agency to follow the guide and adopt”. (Policymaker)

Regarding due process, one participant, an academician, mentioned that the government plays a very important role in conducting the regulation and determining the implementation period. This statement continued with a response from one policymaker participant, and the time taken for due process should be between 12 to 24 months. Another policymaker

mentioned that there is a need for buy-in from the stakeholders. In addition to the statement, most participants agreed that the stakeholders need to be engaged in developing the QCT policy.

"It is good to build a committee between the ministry and the academician".
(Policymaker)

"Stakeholders' engagement is a must". (Academician)

"We must engage the stakeholders in developing the QCT policy".
(Policymaker)

"We should engage with the stakeholders to get their important view on the QCT policy". (Policymaker)

Later in the discussion, one participant, a policymaker, stressed the importance of awareness towards the government agency and commercial on the QCT to have all the above-mentioned due process. Based on the observation, a policy development process is vital before the adoption or implementation of QCT. Most participants agreed that policy development helps the nation evaluate possible options that best suit the implementation of QCT policy in Malaysia. Policy development also should consider enough and necessary flexibility for future changes in technological advancement.

Theme 4: Policy Implementation and Enforcement

In this part of the discussion, the moderator discussed the implementation and enforcement of the QCT policy and how it relates to relevant parties. Most participants, especially the policymaker, said that the government should enforce the policy. Participants also agreed that the willpower of stakeholders will help with good QCT policy development.

"A good governance structure can ensure the QCT policy is fully implemented". (Academician)

"QCT should become the government agenda and should push for it".
(Policymaker)

"The stakeholders can ensure when the agencies and commercial can handle the QCT. as per required to ensure the QCT policy is fully implemented".
(Policymaker)

In the discussion, one of the participants, an industry player, suggested that The National Cyber Security Agency (NACSA) is the best place or the main communication channel to know and start the QCT policy adoption. Meanwhile, from the written answer, the academician suggested a Ministry to anchor the QCT policy. A good and effective governance structure and clear jurisdiction are important, especially in the QCT context. This includes the Ministry of Science, Technology and Innovation (MOSTI) and the Ministry of Communications and Digital Malaysia to anchor the policy. The academician explained that there is a need for a cabinet commitment and directive to mobilise various agencies to disseminate the action. Moreover, a policymaker mentioned in the discussion that awareness of the right group is important; the policymaker added that the policy should be communicated to relevant parties through awareness programs and training to the parties.

Based on the discussion, the goals and objectives can be achieved if a policy is effectively implemented. This is due to the bureaucratic activities that will eventually shape the effective implementation of policies. The implementation process should also be supported by the monitoring body responsible for keeping track of the implementation and helping the nations to remain globally competitive.

Theme 5: Issue and Challenges

There are some issues and challenges that participants raised through verbal answers.

“The government agencies should know the choice of approach, who will then be the lead agency to drive the QCT development”. (Policymaker)

“The willpower to execute the document in which the challenge about quantum document would be, is it going to be a policy, is it going to be a legal document or just a broad document”. (Academician)

“The technology development/ preparedness for any the VUCA world (volatility, uncertainty, complexity, and ambiguity), the vulnerable world that we will see, uncertain, complex, ambiguous could be one of the challenges”. (Academician)

“The issue will be on the Stakeholders. They need to understand the matter within the context of e-sovereignty & economic as well as social well-being”. (Academician)

“The awareness and trust by the main players might be the challenge that will face”. (Policymaker)

“The challenges will be on the public acceptance and industry acceptance”. (Policymaker)

“The issue will be on the implementation, and the usage of the policies and the undertaking of the policy by the Malaysian is not up to the parr which allows the policy to enforce”. (Policymaker)

In this part of the discussion, the moderator asked the participants for input on the issues and challenges, which can be either internal or external, faced by Malaysia in developing new Information and Technology (IT) security policies.

Internal factor

Based on the discussion, one of the internal factors is the jurisdiction between authorities in Malaysia. Most participants agreed that there must be clear jurisdiction between authorities in Malaysia, specifically for QCT. One of the ideas was that specific ministries and relevant sectors must act as a lead agency to monitor and regulate the technology in Malaysia. There is also a need to have legal and regulatory requirements involving the enforcement of the government and standard regulation to propose quantum security.

The next internal factor is the lack of awareness of quantum security. Based on the verbal and written answers by the participants, most of the participants agreed to have stakeholders involved (such as policymakers, industry and the public). The additional sector that should be involved is the education sector. Other than that, talent is also one of the internal factors raised by the participants. One participant, an academician, suggested that the government develop local skills and execute proper training about QCT policies and development. The discussion shows that the degree of quantum development in Malaysia will highly depend on these factors.

External factor

Jurisdiction can also potentially be the external factor to the development of new technology or policies, which are by having enforcement from the government, directive government and clear division of power. Other than that, stakeholder engagement is one of the external factors, especially regarding awareness and acceptance of the new technology. All the stakeholders must instil an awareness and understanding of the latest technology. Later,

after they understand the technology, only the stakeholders can implement and monitor it.

The discussion continues with factors that contribute to the success of a good policy. From the verbal answer, only the industry player answered which factors contribute to a policy term as mentioned above; a broad document should be revised more often. Moreover, from the written answers, the policymaker was saying that synergy with multiple stakeholders is the factor that contributes to a good policy.

“To have a multi-disciplinary team (competent) to drive the policy document”.
(Academician)

“The government should be involved in all main activities directly affected by quantum issues”. (Policymaker)

“The government should get support from all relevant parties”. (Policymaker)

“The willpower of the lawmaker can contribute to the success of a good policy”.(Academician)

The discussion continues with examples of successful policy development and the current implementation – current initiative/policy development. A few examples of successful policy development and implementation examples include the National e-commerce policy and National Foreign policy, National Cyber Security Policy and MyDigital.

Theme 6: Recommendation to Adopt QCT

Awareness

Based on the discussion (verbal answer), two participants have recommended adopting QCT recommend to identify the suitable age to start creating awareness of QCT, especially to include formal education and suit QCT into their current subjects and to include the QCT in their current syllabus. The policymakers in the discussion supported this idea as they highlighted that education on quantum should be enforced in schools, universities, and companies.

“There is a need to identify how the syllabus will look like”. (Academician)

“We should give an awareness to the right party and learn from the beginning. Knowledge

transfer on the QCT to the management level from top to bottom”.
(Policymaker)

Based on the written and verbal answers, the awareness program should focus on the lower and higher education sectors and the government sector.

Talent and education

This added to the recommendation regarding talent in the discussion; one of the participants mentioned that there is a need for a relevant workshop to have continuous talent in this field.

“The university should engage with the industry and vice versa. So there is no mismatch between the industry and the graduates” (Policymaker)

“Therefore, the industry’s expectation against the graduates will be lesser, and they can pool talent and development accordingly”. (Policymaker)

“To adopt QCT, relevant parties must prepare our young people for what is coming”. (Academician)

To fulfil this, there is a need to narrow down the gap between practitioners from industry and policymakers. Therefore, good engagement between stakeholders is really important, and it also comes with a regular check or review to observe and monitor for changes accordingly.

Good Governance

In the opinion of policymakers, consistency in policy and directives is a must unless there is a change. From the written answer, one policymaker participant suggested that the National Security Council and National Science Council advise the respective authorities to drive the agenda to adopt QCT. This added to most participants' consent to revisit the existing policies and to have a better policy document.

"We should establish a policy which includes the implementation plan to execute the idea". (Policymaker)

Establish a dedicated task force for QCT

The discussion on governance leads to the recommendation to establish a dedicated task force that specifically caters to QCT adoption. Based on the written answer of the discussion, a policymaker suggested that there is a need to update and revise the current practice as a good and effective composition for the advisory board, and the advisory board should consist of experts from varied expertise or different backgrounds.

Limitations

While focus group discussion can provide the information needed, in terms of the limitation of the study, the focus group session has 18 members. The level of information in some responses would have been limited in a bigger group due to the pressure participants feel to share their responses. Therefore, conducting focus group discussions with the presence of written answers has been found to reduce the limitation.

CONCLUSION

This study aimed to understand the development of QCT and its impact on the cybersecurity landscape by bringing together academicians, industry experts and policymakers to share perspectives and opinions. This study analysed the national policy direction in adapting QCT to form a more sustainable national cyber security in Malaysia. It can be concluded that all participants realised that the QCT policy is pertinent and that the existing security policy adopted by Malaysia will be used to adopt QCT policy development. This study discovered issues and challenges of QCT adoption that should be the main concern to cater to adopting QCT policies and development. Awareness, involvement of stakeholders, good governance, talent and a dedicated task force on QCT are among the highlights of this discussion.

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THE FUTURE OF UTILIZING ARTIFICIAL INTELLIGENCE IN PUBLIC POLICY PROCESS IN THE GOVERNMENT OF THE REPUBLIC OF INDONESIA

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ABSTRACT

Today's globalisation has encouraged various innovation efforts and significant technological leaps in countries, including Indonesia. Globalisation goes hand in hand with the development of the Industrial Revolution 4.0, which has affected fundamental changes in patterns of human interaction, modernisation in the economic sector and digital transformation in various sectors, including the political and government sectors. One of them is the use of artificial intelligence technology. The use of artificial intelligence technology is currently a challenge, as well as many opportunities for the government and the public sector. Issues and discourse regarding the use of artificial intelligence technology are, of course, not just a figment of the imagination. Still, it has extraordinary potential and opportunities if used properly. Using artificial intelligence technology in public policy will increase efficiency, effectiveness and responsiveness in policymaking and benefit society. Not only that, the data analysis used by the government is also quite comprehensive so that the stages of the policy can be monitored and evaluated quickly. However, in practice, it seems that it still takes time because there are still challenges and obstacles faced by the government and society in general, starting from the uneven distribution of technological infrastructure in the country, gaps in internet access in Indonesia, low ability and understanding digital literacy of the people, lack of understanding of human rights related to the potential for bias in automation, and the failure of the government to manage policies related to technology.

Keywords: Globalization; Digital Transformation; Artificial Intelligence; Public Policy

INTRODUCTION

The world is currently moving so fast and dynamic. Many big and fundamental changes occur in human life. Of course, these changes are also driven by globalisation, which brings the inevitability of the development of technology, information and communication. The era of globalisation shows us all the increasingly real transition of the social order of society, which covers all aspects of people's lives, starting from the economy and culture to technology, by emphasising the aspects of information, communication and technology (ICT), which then causes significant changes in patterns of human interaction. Through the use of technology and communication, it facilitates various flows of information received or even the exchange of information without any differences across regions. The progress of these globalisation devices blurs the boundaries between regions, cultures, languages, and even religions (Harianto, 2018). Advances in technology and communication are marked by the development of new platforms for interaction in the form of social media, which function as online media with interconnected communication networks in sharing and creating news and connecting human interactions in the local-global sector (Annisya & Putra, 2021).

Now, the development of globalisation certainly does not stand alone but goes hand in hand with current phenomena such as the Industrial Revolution 4.0, technological disruption, society 5.0, and the influence of the COVID-19 pandemic, which has hit the

world since 2020. So that our ears are no stranger to hearing the term technological disruption. Of course, technological disruption was born with the terms Industrial Revolution 4.0 and Society 5.0, bringing extraordinary meaning to human life in all corners of the world. The industrial revolution that is currently happening all over the world gives us a real picture that change is happening without knowing regional boundaries.

In its history, long before today, the Industrial Era 1.0 only introduced mechanisation in the industrial world so that human activities became more effective and efficient. Then, this era continued with the Industrial 2.0 era, where mass production was introduced and quality standardisation was implemented. The introduction of automation and robot-based industrial processes is a sign of the start of the industrial era 3.0. This time, known as the Industrial Era 4.0, is when cyber collaboration with manufacturers is widely applied. This is demonstrated by the increasing volume of data, computing power and connectivity; the emergence of analytics, capabilities, and business intelligence; the occurrence of new forms of interaction between humans and machines; and the improvement of digital transfer instructions to the physical world, such as robotics and 3D printing (Bukman Lian, 2019, p. 41).

However, now, the Industrial Revolution 4.0 shows the fact that there has been a change in the mechanism for the production of goods and services, which is characterised by several features, namely the use of the Internet of Things and the Cyber-Physical Production System in the production process of both goods and services (Vaidya et al., 2018). In its development, there are at least nine pillars that characterise the development of Industrial Revolution 4.0 technology, namely 1) Big Data Analysis, 2) Autonomous Robots, 3) Simulation Technology, 4) Horizontal and Vertical System Integration, 5) Industry-based Internet of Things (IoT), 6) Cyber Security, 7) Cloud-based Information Technology, 8) Additive Manufacturing, 9) Augmented Reality Technology (Vaidya et al., 2018).

The development of the industrial revolution 4.0, society 5.0 and technological disruption will continue to develop dynamically in various aspects of human life. Day after day, year after year, people tend to be able to adapt to these changes. Finally, in 2020, everyone was shocked by the COVID-19 virus, which eventually became a pandemic. Since 2020, the world has witnessed the presence of Covid-19, which has disrupted various aspects of human life. The presence of the COVID-19 pandemic prompted a new concept called triple disruption. Triple Disruption is the concept where the world faces significant changes in 3 important aspects, including Digital Transformation, the Covid 19 Pandemic and Climate Change.

Digital transformation is now a necessity for human life. Technological and communication innovations developed in the 21st century have triggered digital transformations that have radically changed various aspects of human life. Digital transformation, accompanied by the intensity of globalisation, has driven fundamental changes related to mindsets and models of social interaction and changes in various aspects of life. The emergence of various contemporary digital technologies such as artificial intelligence, 3D printing, automation, robotics, and the 'Internet of Things' is changing the existing social, political and economic order. There are two fundamental sides to digital transformation that we need to pay close attention to. First, the rapid Digital Transformation will offer new opportunities for economic and other social progress. Advances in technology provide opportunities for societies that are more open and able to access more globalised markets. At the same time, technological advances pose a challenge to the competitiveness of local businesses. Second, digital transformation will present new challenges, such as digital colonialism and disparities in societal access (Winanti et al., 2021, p. 2). Whether we admit it or not, current technological advances leave issues regarding disparities in access and ownership of digital technology, which can have implications for data security and data sovereignty issues. The data shows that Indonesia has tremendous potential in the digital economy. However, technology companies, including marketplaces, are mostly controlled by foreign companies. If you are not careful, Indonesia will only be a market, and foreign parties will still control ownership of data or digital technology (Winanti et al., 2021, p. 3).

The development of digital technology accelerated with the emergence of the Covid-19 pandemic in 2020. If before Covid-19, the use of digital technology was still considered an option, after the arrival of Covid-19, the use of digital technology became a necessity. Health protocols to prevent the spread of viruses that require changes in how humans interact have caused the acceleration of the use of technology to become unavoidable. Digital technology adaptation is an enabling factor for new adaptations in various sectors of life, starting from the education sector, bureaucratic services, health services, the economy, work systems, and other forms of social interaction. The Covid-19 pandemic has presented a reality to all of us that has not only spawned a health crisis, national and global, but has also forced an overhaul of the entire governance of public, economic and social affairs (Winanti et al., 2021, p. 5).

This paper tries to present optimism for efforts to accelerate digital transformation in the Politics and Government sector through a comprehensive review based on data and supporting literature to see how the future holds for the application of artificial intelligence in preparing Public Policy in Indonesia. However, our country is currently very aware of and responsive to dynamic changes at the global level, especially in the technology field. Many policy instruments have been pushed to accelerate digital transformation efforts in the public sector. Last, public sector innovations at the regional and central government levels have adopted dynamic technological developments to increase effectiveness, efficiency and quality in administering government and public services.

METHODOLOGY

This qualitative research with literature study (library research) describes the future of utilising Artificial Intelligence in the public policy process in the government of the Republic of Indonesia. Library research is based on information from scientific publications, previous research, or other written sources of support. The main information sources in this study are obtained from the analysis of previous research publications and other documents related to the study objectives. In this study, the process of data analysis used is qualitative data analysis. This is analysed and interpreted concerning the theoretical foundation of research-related problems.

LITERATUR REVIEW

Artificial intelligence has become a technological innovation that has driven significant changes in various sectors, including government. AI's ability to quickly analyse data, recognise patterns, and make automated decisions has changed how government works and makes decisions. In an increasingly advanced digital era, using AI in government brings significant benefits (Alvin Mahamidi, 2023). This becomes a challenge for the government in utilising artificial intelligence technology in various processes of government administration, public administration and the process of formulating public policies.

The development of artificial intelligence in formulating public policies in Indonesia is no longer impossible, given that there is considerable opportunity and potential in the development of artificial intelligence technology. It is indeed felt that the use of artificial intelligence technology in Public Policy will offer a number of opportunities and potentials to increase efficiency, effectiveness and responsiveness in policy formulation and benefit society as a whole. Artificial intelligence technology will certainly offer a fast and accurate data analysis process from various sources, including public data and data generated by the government itself. In addition, through the use of artificial intelligence technology, the decision-making process is considered to be getting better. Artificial intelligence systems will help government stakeholders to make better, more data-driven decisions. AI algorithms can provide recommendations based on data analysis so the policies taken are more likely to achieve the desired goals.

Artificial intelligence in public policy also enlarges the risk prediction and prevention system. The AI system can identify potential risks in various fields, such as public health, security, and the environment. By analysing historical and current data, governments can take preventative steps to tackle problems before they become more serious. Most importantly, the artificial intelligence system is considered capable of carrying out the process of monitoring policy performance effectively. So that in this way, the government can identify policies that are successful and need to be improved. However, behind these potentials and opportunities, there are still public policies in Indonesia, such as data privacy and security, ethics in the use of AI and ensuring that the presence and transformation of technology will not widen social inequality in society.

RESULTS AND DISCUSSION

The Development of Technological Disruption in Politics & Governance in Indonesia

Lately, it seems like our ears are familiar with the term disruption. The term that was born together with the terms Industrial Revolution 4.0 and Society 5.0 certainly brings extraordinary meaning to human life worldwide. The industrial revolution that is currently happening all over the world gives us a real picture that change is happening without knowing regional boundaries.

The development of the industrial revolution 4.0, society 5.0 and technological disruption will continue to develop dynamically in various aspects of human life. Day after day, year after year, people tend to be able to adapt to these changes, including the government sector. The government's efforts to respond to the dynamics of today's extraordinary technological developments have been proven through a process of digital transformation in the public sector, which has now become one of the basic needs for state administrators given the unpredictable global environmental conditions and which have the characteristics of Volatility, Uncertainty, Complexity, Ambiguity (VUCA) requires all sectors, including the bureaucracy, to work in an agile, adaptive and fast manner, especially in terms of digitalisation. In addition, in facing the current global conditions, using information and communication technology in governance is no longer an option but a necessity. It cannot be denied that the use of information and communication technology can support government activities, both in government administration activities and public services, which are expected to increase the effectiveness and efficiency of government services (Yunas, 2023: 203).

The government's efforts to accelerate digital transformation are certainly not half-hearted. Various policies and political and budgetary support have been made to accelerate the realisation of this agenda. From a policy standpoint, the Government has issued Presidential Regulation INPRES No. 95/2018 regarding SPBE (Sistem Pemerintahan Berbasis Elektronik), which was then reaffirmed through Presidential Regulation INPRES no. 132/2022 concerning National SPBE Architecture. This policy certainly has consequences for the budget mechanism needed in preparing the National SPBE architecture and encouraging the acceleration of digital transformation in government at the regional level.

Since the last few decades, the Government at both the Central and Regional levels has continued to develop an e-government system to improve digital-based public services. It is hoped that many public services, such as tax payments, business licenses, health services and population administration services, will become more accessible through online platforms.

In addition to implementing E-Government in aspects of government as a form of government adaptation to technological disruption. Current technological developments also influence the emergence of e-democracy concepts and ideas. The concept of e-democracy or electronic democracy is currently being studied in several projects and

research to facilitate wider public participation in political decision-making. In Indonesia, it does not exist directly yet, but the idea of E-Democracy has emerged in every election process. Usually, the idea of E-Democr, the idea of E-Democracy is in line with the idea of carrying out elections online monthly. The application in Indonesia has not been carried out en masse in the general election process, such as in several developed countries such as the United States. However, several regions in Indonesia have tried and implemented online elections or e-voting on a small scale, such as village head elections and so on. This technology has very good goals to speed up the voting process and minimise fraud in the election stages, which are minimised very long at this time.

In addition to the idea of E-Democracy and the discourse on implementing E-Voting in Indonesia, digital transformation efforts in the Politics and Government sector are currently also trying to apply Big Data in the Policy Analysis process. On various occasions, the Government of Indonesia has begun to use big data and data analysis to understand trends and patterns in society. A fairly complete data set will assist in formulating more targeted and evidence-based policies (evidence-based policy).

Not only that, digital transformation efforts in the political and government sectors have been of considerable benefit in realising transparency and public participation in government. The use of technology allows governments to increase transparency and public participation. Social media and public participation platforms make the lines of communication between the government and the public easier and faster. Many innovations have emerged in various regions, such as Sambat Online in Malang, East Java and the development of community service applications by Qlue startups, which are used in several central and regional agencies.

Efforts to build digital transformation acceleration in the government sector at the central and regional levels, of course, are not enough with policy and budget support alone. However, there must be a political commitment that is manifested through leadership models and characteristics. Currently, amid the complexity of problems in the government sector, which are increasingly varied and the need for technological adaptation, a public leader is required to be responsive and literate in technology in order to be able to capture messages from the public to take the organisation in the right direction and be more advanced. Leadership that is literate in digital technology (digital leadership) is ultimately one of the keys to successful digital transformation in the government sector, both at the central and regional government levels, considering that leaders are increasingly required to have agile decision-making skills that are relevant to developments in the digital era (Yunas, 2023: 205).

Opportunities & challenges of implementing Artificial Intelligence in Public Policy in Indonesia

Amid dynamic changes in technology and information, the Government of Indonesia seems to have good technological awareness and understanding in responding to these developments. However, there is still much debate amid efforts to accelerate digital transformation in Indonesia. Starting from issues regarding the distribution of technological infrastructure in the country, the gap in internet access in Indonesia, the low level of digital skills and understanding of society, the lack of understanding of human rights related to the potential for bias in automation, and the government's failure to manage policies related to technology. Of course, this is a challenge for the government to find a way out. Not then, instead retreating and denying the process of change that is so rapidly experiencing the world today. Optimism to accelerate digital transformation in Indonesia needs to be looked at comprehensively regarding the opportunities and challenges—moreover, the issue of the application of artificial intelligence in the political and government sectors.

The presence of artificial intelligence is a necessity that was born from the Industrial Revolution 4.0. The presence of artificial intelligence is not sudden, as the public was shocked by the emergence of ChatGPT in November 2022. Indeed, since the launch of

ChatGPT in November 2022, around 100 million users have registered themselves. For comparison, it took Tiktok nine months to reach that number. ChatGPT and Technology Large Language Models (LLMs) have increasingly normalised. They are quickly used for a wide range of human activities, from drafting e-mails, working on school assignments, and making project proposals to doing coding work faster. ChatGPT, in this case, can be seen as an innovation currently being diffused or spreading widely to society (Rahmawan, 2023).

Issues and various studies regarding the application of artificial intelligence in political and governmental aspects have now been widely circulated. However, it is still waiting for various studies that are quite comprehensive regarding the opportunities and challenges. Concerning the application of artificial intelligence in the political, governmental and public sector aspects, the Government has a guide in order to optimise digital governance and how to build integrated aspects of services, resources, and technology, one of which is also related to the development of artificial intelligence technology/artificial intelligence to optimise the decision-making process, namely Presidential Regulation INPRES no. 95/2018 concerning Electronic-Based Government Systems (SPBE) and Presidential Regulation INPRES No. 132/2022 concerning the architecture of the National Electronic-Based Government System (SPBE) (Natalisa, 2023). On the other hand, the Government has also made the 2020-2045 Indonesia National Artificial Intelligence Strategy, in which five priority areas have the potential for the development, implementation and utilisation of artificial intelligence, including; First in the health sector, artificial intelligence technology innovation is used to speed up service time, expand coverage, and reduce health costs. The presence of a telemedicine mechanism will make it easier and optimise patients to get health services without having to visit a health centre directly or provide services to a doctor (Badan Pengkajian dan Penerapan Teknologi, 2020). Second, in the field of bureaucratic reform, there are several forms of artificial intelligence, such as the development of ChatBots that can serve two-way communication with the public 24 hours a day. Third, in education, opportunities for developing artificial intelligence in the future will lead to precision learning. Learning not only considers students' cognitive, affective and psychomotor aspects but also considers students' daily behaviour or habits. Then, in the food security field, AI can be carried out on satellite images to identify which areas have access to electricity and which do not. This imagination can also be used to identify commodities grown in an area and predict the harvest of each commodity, finally, in the field of mobility and smart cities. The utilisation of artificial intelligence can present intelligent traffic management solutions to ensure that residents can move from one point to another safely and efficiently (Badan Pengkajian dan Penerapan Teknologi, 2020).

Artificial intelligence in various fields, especially in public policy, holds great opportunities and potential. Artificial intelligence in Public Policy certainly increases efficiency, effectiveness and responsiveness in policy formulation and benefits society as a whole. Artificial Intelligence technology will certainly offer a fast and accurate data analysis process from various sources, including public data and data generated by the government itself. In addition, using Artificial Intelligence technology, the decision-making process is considered to be improving. Artificial intelligence systems will help government stakeholders to make better, more data-driven decisions. AI algorithms can provide recommendations based on data analysis so that the policies taken are more likely to achieve the desired goals. In addition, it is considered that using artificial intelligence technology in public policy will help identify potential risks in various fields, such as public health, security, and the environment. By analysing historical and existing data, governments can take preventative steps to address problems before they become more serious. Not only that, one of the weaknesses of the current policy stage is that the policy monitoring process might be optimised through the presence of artificial intelligence technology. AI technology can maximise efforts in monitoring and evaluating the performance of various policies in real-time. In this way, the government can identify successful policies that need to be improved or evaluated in more depth.

In addition to seeing the opportunities and potential for using artificial intelligence in public policy in Indonesia, we must look at the various weaknesses in using artificial intelligence in public policy. First, the use of AI technology in public policy has the potential to create

bias and discrimination. AI systems can produce biased and discriminatory decisions if the data used tends to contain bias or the algorithms are not designed properly. This can lead to injustice in formulating and implementing public policies and is less profitable for vulnerable groups. Second, the problem of transparency and accountability of policies produced. Some AI algorithms, especially in deep learning, can be complex and difficult for humans to understand. This lack of transparency can reduce accountability and make it difficult to explain or account for decisions recommended by artificial intelligence. Third, the use of artificial intelligence technology must also consider data security and privacy risks. The use of AI in Public Policy can lead to data security risks if the sensitive data used by AI systems is not sufficiently protected. In addition, the government needs to ensure that people's data is processed and used appropriately and according to privacy regulations. Especially at this time, the issue of personal data protection in Indonesia needs serious attention from relevant stakeholders. Even though there are already regulations governing personal data protection in Indonesia, there are still challenges in implementing and enforcing the law. Technological developments and the increasingly widespread use of data pose new challenges in protecting people's data. Therefore, monitoring and updating regulations according to technological developments and community needs is important.

Another drawback of using AI technology in public policy that needs to be anticipated is that using AI in public policy processes can change employment structure and replace certain human jobs. This can pose challenges in dealing with these changes social and economic impacts, including economic disparities and inequality. The use of AI must be compatible without creating new socio-economic gaps in society. In addition, there are quite basic weaknesses in using AI technology where this technology has limitations in terms of context, understanding of complex situations, and empathy. Some policy decisions require special consideration and more detailed processing that cannot be made solely by AI. Because, indeed, sometimes AI decisions are based on incomplete or inaccurate data. This can lead to prediction errors and decisions that negatively impact public policy.

Artificial intelligence technology also requires a sizable investment in the technology infrastructure, including hardware, software, and capable and trained human resources. In addition, the cost of maintaining and developing AI technology must also be considered. This is where the government has a political commitment to using AI technology in public policy, and the government sector, and maximum budget support is also needed.

Referring to the various sides of these weaknesses, the Government and other stakeholders need to pay attention to these weaknesses and take appropriate steps to mitigate risks and maintain integrity and responsibility in using artificial intelligence technology in public policy. In implementing AI technology, transparency, ethics, regulation, and public participation must be prioritised to ensure its responsible use and in the interests of society.

CONCLUSION

The rapid development of technology today is an opportunity and a challenge for Indonesia. As a country with a relatively large population, supported by cultural diversity and local wisdom, as well as economic growth that continues to increase from year to year, optimism for digital transformation efforts in various sectors, especially politics and government, must continue to be built. Moreover, in the Southeast Asia region, our country has the largest digital economy market power today with a demographic structure of a technology-savvy young generation, making digital transformation efforts and the use of AI technology in public policy also potentially able to be implemented in a targeted manner.

Using technology, especially artificial intelligence, in public policy has tremendous potential and opportunities if used properly. Utilisation of artificial intelligence/AI technology in Public Policy will increase efficiency, effectiveness and responsiveness in policy formulation and benefit society as a whole. Also, the use of artificial intelligence technology will certainly

offer a fast and accurate data analysis process from various sources, including public data and data generated by the government, so that the decision-making process is considered to be improving. What is most needed at this time is the existence of AI technology that can be used to maximise efforts to monitor and evaluate the performance of various policies in real time.

However, it cannot be denied that the use of this technology still poses many challenges and obstacles faced by the government and society in general, starting from the uneven distribution of technological infrastructure in the country, the gap in internet access in Indonesia, the low ability and understanding of literacy. Digital society, the lack of understanding of human rights related to the potential for bias in automation, and the government's failure to manage technology-related policies.

Of course, these opportunities and challenges must motivate the government and related stakeholders to continue improving. Because, after all, the ability to adapt to increasingly dynamic changes is very much needed. We cannot reject the various existing changes because of many gaps and obstacles. However, we cannot formulate the right design or formulation to minimise these obstacles. The application of artificial intelligence technology in public policy in Indonesia offers great potential to increase government efficiency, effectiveness and responsiveness and provide benefits to society as a whole. With proper attention to this challenge, we must be optimistic that the Indonesian government can face and overcome obstacles in using AI technology to achieve better development goals.

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IMPLEMENTATION OF MALAYSIA E-GOVERNMENT INFORMATION LEAKAGE PROTECTION MODEL

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ABSTRACT

The implementation of digital technology in the government management process could realize the features of e-government, which apply information technology as a role in the management. It brings a paradigm that highlights the role of technology in facilitating human affairs. However, there are still shortcomings that require innovation, for example, in the aspect of document security, which is a confidential secret for the government. The Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) saw this as a need for improvement and took the initiative to develop methods to control digital documents from the risk of leaking secret information by establishing an MSS method managed through the Malaysia E-Government Information Leakage model (MyEigle) in governance related to official government documents. Then, the model of document management is developed based on the working processes of the government sector in Malaysia. To test the functionality of the model, a pilot study has been done among the government servants in Putrajaya. The test results showed that there was an improvement in document management and were positive responses received among government servants.

Keywords: e-government, document security, confidentiality, information security, digital document.

INTRODUCTION

The Digital Era is a testament to human innovation and adaptability, an era where the boundaries between the physical and digital worlds blur. It empowers individuals and organisations alike to collaborate, learn, and innovate on an unprecedented scale. Nevertheless, it calls for responsible stewardship of these digital tools to ensure they serve the greater good and do not exacerbate existing disparities. As we embrace the opportunities of this era, we must remain vigilant, ethical, and committed to using technology as a force for positive change, steering the course of the Digital Era towards a brighter tomorrow.

However, the problem with the digital era is the threat to cyber security. The Digital Era has forced us to rethink traditional security paradigms. It is not merely about protecting physical assets but also safeguarding intangible digital assets, such as data, intellectual property, and confidential documents. The concept of security now extends to encryption, multi-factor authentication, and constant vigilance against emerging cyber threats. In this era, cybersecurity is not just a matter of individual responsibility but also a between the government, corporate, and many more relations in global concern.

The security issue with digitalisation in e-government is tied to how it is managed. This is because the management method used will be a critical factor regarding the safety and effectiveness of using the digital document. In the administration of a government, this factor needs to be the focus of agencies to ensure that the benefits of digitalisation are best taken in administrative affairs. Malaysia is one of the countries that prioritises digital security in its governance. It was proven when it was recognised among the top ten countries that have the best cyber security systems in the world based on the Global

Cybersecurity Index (GCI) [6]. One of the aspects of cyber security that are a concern in Malaysia's e-government is the safety of documentation.

In the administration of the government in Malaysia, certain documents are classified as confidential and cannot be disclosed to the public. It is bound by Section 8 of the Official Secrets Act 1972 (Act 88) [2], which, if convicted, can be punished with imprisonment of not less than one year but not more than seven years. However, the leakage of official government secret information still occurs [1]. Some of the conditions that need to be paid attention to are the human factor, the change in technology and the process and procedures of the document being managed. With the rapid innovation of digital and Internet of Things technology currently, the risk of information leakage is critical and risky since it can be done with just the convenience of at the tip of the finger.

To minimise the risk of leakage of confidential government information, MAMPU, the Malaysia Prime Minister's Department, has taken the initiative to implement a project to protect against the leakage of official secret information by using the Managed Security Service (MSS) method. This method has more of an e-government concept that digitises confidential documents and is managed completely digitally, which is called MyEigle. This MyEigle project uses local ICT products to monitor and prevent the risk of leakage of official secret information at government servants, whether received or sent through web server channels, social media, mobile storage, e-mail, and other smart devices. A series of them developed the Information Leakage Protection (DLP) framework and the Bring Your own Device (BYOD) implementation guidelines for Malaysian government servants as an effort to prevent the leakage of information and confidential documents from being leaked either due to human factors or the technology used.

This paper will discuss the relevant role and practices of MyEigle in detail. The combination of all those mentioned above will then be modelled to become an effective digital document management process and meet the expected objective of reducing the risk of leaking information and confidential government documents.

BACKGROUND RESEARCH

This study should be of high priority to be done considering the increase in leaks in government information management systems. The occurrence of the pandemic in 2020 and the ever-increasing use of digital technology add to the risk of leaking confidential information in the future.

There are three methods proposed to minimise potential information leakage:

- i. Data-in-storage (Data-in-storage/Data-at-rest) - inactive digital data stored in any digital form (database system, file system, various storage media)
- ii. Data-in-movement (Data-in-motion) - digital data being transferred in the network (web browser)/ movement (via the Internet, wireless network, Malaysia Government servants' email)
- iii. Data-in-use (Data-in-use) - digital data in use, i.e., data that is being processed, deleted, accessed, or read (via desktop computer, laptop)

The implementation of information control methods is widely studied in several other countries as well. Among them are Finland [4], Estonia [3], and Sweden [5]. This method of information storage is not only implemented in government administration.

Herrera Montano et al. [14] survey the existing techniques to protect against data leakage and to identify the methods used to address the insider threat. The study was concluded from 42 relevant papers from 2011 to 2022. The techniques involved in the study are intelligent documents, encryption, hash, virtual file system, biometrics etc. The most

popular technique used was encryption. However, machine learning is growing as a trend lately.

Makarov and Shabunin analyse Russian e-government development practices and some other countries [7]. From the study, they proposed a policy based on PMI project management standards and IDEF0 standards as a methodology for public authority project management. They found the problem was that the notation tools used were not enough to reflect all the business processes of the e-services for public authorities. So, they customise the methodology for the project management development with some extra elements (objects and subjects) designed to describe the process types and the corresponding e-services.

Patz [15] explores the case study of the European Commission in e-government and public administration in Europe. The discussion is purposely about leaking and leak prevention more broadly and analyses the efforts of the European Commission to prevent leaks. This is an empirical study of leaks and anti-leak measures in Western public administrations.

Abidin and Husin begin the study with the weaknesses of the existing document management procedures in government organisations [8]. After that, a new framework that integrated the implementation of the NFC system was proposed to suit the current trend in communication. The study is based on Malaysia's e-government system by focusing on the security of short-range communication and the peer-to-peer communication capability in most mobile devices. It is mobile-based and suitable for Android mobile.

AIM OF RESEARCH STUDY

This study was created to test the effectiveness of using MyEigle in an e-government administrative system. MyEigle is developed based on the following policies:

4. Public Sector Cyber Security Framework (RAKKSSA)

Article 2.2.1.4 Protection of Data Leakage stipulates that the agency must carry out a risk assessment and identify the appropriate technology to prevent legitimate users from disseminating information without permission.

5. Security Order (Review and Amendment 2017)

Paragraphs 122 and 133 of the Security Control of Official Secret Information stipulate that the agency must implement appropriate controls to protect the leakage of official secret information.

6. Malaysia Cyber Security Strategy (MCSS) 2020 – 2024

Pillar 1 Strategy 2 Improving Organizational Management and Business Operations stipulates that the agency needs to develop information leakage protection mechanisms through related policies and guidelines.

The details of the model will be described in Section 4. The contribution of this study is significant with the e-government concept in the digital era to look at the effectiveness of using MyEigle in public sectors in Malaysia.

MYEIGLE PROTECTION IN PUBLIC SECTOR

MyEigle is a protection model in public sectors that developed based on the experience faced by government servants in working with various government sectors in Malaysia. It was developed to control the use of official government documents to avoid the leaks of documents and information through document classification methods and effective management practices.

It was implemented during the pandemic of COVID-19 period in Malaysia, where most of the activities are executed in digital mode. It continued to be applied during the post-pandemic era partially until now. The details about the MyEigle model are as in Figure 1.

Figure 1

MyEigle Model



1. Risk Management

Risk assessment activities must be carried out to ensure that all agency members who produce and handle official secret information are protected from the risk of information leakage. This list of civil servants is dynamic based on the duties and information handled.

2. Change Management

Civil servants were found to lack safe information-sharing methods as stipulated by the CGSO [9]. A comprehensive, periodic, and consistent training and awareness program should be implemented to build awareness and form a culture that emphasizes information security, especially involving the sharing and storing of official secret information. Wai [10], in the Human Factors in Information Leakage study, suggests that there is a need to continuously train and remain where, based on his research, most employees do not practice safe information-sharing methods.

3. Process Owner

The process owner is the party responsible for information management in the agency. The process owner needs to be identified so that a comprehensive plan can be implemented to ensure the process of handling official secret information is orderly and meets the requirements of laws and regulations in force.

4. Suitable Technology

The following elements need to be in high consideration to complete this study.

a. Computer equipment

The use of computer equipment with a high capacity of random-access memory (RAM) and storage capacity of solid-state drive (SSD) is important to ensure that the process of detecting official secret information can be carried out in a suitable period, especially if the detection feature through optical character recognition (OCR) is activated.

b. Smart devices

The limitations of current technologies to monitor information leaks through Android and iOS devices cause many leaks to occur through personal Android and iOS

devices. Furthermore, BYOD is difficult to fully implement due to the lack of clear policies regarding the use of BYOD by civil servants, visitors and contractors dealing with agencies.

- c. Software and encryption storage
The Security Order enforces that it is necessary to implement encryption methods if it is necessary to bring out or share official secret documents with other parties. Using storage or encryption software that meets the criteria set by the Security Order requires additional provision by MAMPU.
- d. Information Filtering Software
The selection of content filtering applications by using appropriate information detection methods to detect the risk of leakage of official government secret information. The method used by government servants to detect the content of electronic documents against the risk of leakage is to use content analysis, data fingerprinting, and regular expression methods, as suggested by Alneyadi [11]. However, only some of the methods proposed are suitable to implement in this research.

5. Information Channel

Following the current development of communication technology, all information-sharing channels, such as email, instant messaging, mobile storage, and web browsers, must be monitored to ensure that official secret information is not shared illegally.

6. Policy

The uncontrolled use of BYOD will cause networks, ICT systems, and government information to be exposed to the risk of spreading malicious code, which in turn may cause information leakage. Adherence to the policy outlined is crucial in ensuring this project can be implemented successfully.

Developing and enforcing BYOD and DLP policies and guidelines will reduce the risk of incidents of malicious code attacks and information leaks.

7. Superior Support

- a. Governance
The governance that includes the agency's top management needs to be established. It is the key to effective monitoring and reporting actions that can be implemented to ensure that complete and effective planning can be organized toward creating an organization that is free from any information leakage.
- b. Financial Support
Sufficient and reasonable financial allocations with initiatives made especially for the success of change management programs are important for cultivating the right method of handling official secret information.
- c. Audit
The process of auditing against each violation of the rules set in the MyEigle needs to be implemented. As a regular reviewing process, it is very important to look at the cause of non-compliance in the practice, if any. Further action can be taken, and improvement will continuously be implemented.

METHODOLOGY

The methodology used in managing DLP is divided into the following categories:

- i. Monitor, detect, and enforce the protection of information leakage.
- ii. Improving understanding and working culture in protecting official government confidential information among government servants.

- iii. General basic rules of classification of government documents and information.
- iv. Pilot test

i. Monitor, detect, and enforce the protection of information leakage.

- MyEagle Framework was developed to monitor the implementation of DLP among government servants.
- DLP and BYOD policies, Guidelines, and SOPs developed and used to monitor the implementation of DLP by targeting the goal of zero (0) leakage of Official Secret information.
- Monitoring government documents and information leakage via dashboard according to the divisions involved.
- Improving understanding and working culture in protecting official government confidential information among government servants.

ii. Compliance culture so that 100% of government servants understand the SOPs developed.

- General basic rules of classification of government documents and information.
- Classification of the confidential level is stated in Table 1.

Table 1

Classification of Confidential Level

Keyword	Description	Case Sensitive	Occurance	Distance
RAHSIA BESAR	MAMPU RAHSIA BESAR general keyword	✓	2	0
RAHSIA	MAMPU RAHSIA general keyword	✓	2	0
SULIT	MAMPU SULIT general keyword	✓	2	0
TERHAD	MAMPU TERHAD general keyword	✓	2	0

Change of pattern logic operator for basic rule features from Boolean AND to OR to obtain accuracy of rule violation detection.

Pilot test

One Group Pre-test Post-test design are used in this experiment to show that change occurs before and after treatment. Table 2 is the output from the experiment. It was recorded from January to October 2021. The cases increased during the pandemic since most government servants have been working at home since Mei 2021. The pilot study is important because it helps researchers fine-tune the MyEagle model and identify potential issues or challenges before conducting a full-scale study. It also allows researchers to estimate the feasibility of this research and gather preliminary data.

FINDING

Throughout the project, pilot users were given training and a series of workshops on the correct methods of handling classified government information. The understanding of classified information handling procedures was measured at the beginning and end of this pilot project. The results of this study will be supported by the number of rule violations detected by the MyEagle system.

Respondents of the MyEigle pilot project were 200 MAMPU staff involved in handling classified information and were at risk of information leakage.

The study was carried out for 10 months starting January 2021 with a trial period of 5 months and followed by enforcement of the DLP rules starting from June 2021, as stated in Table 2.

Table 2

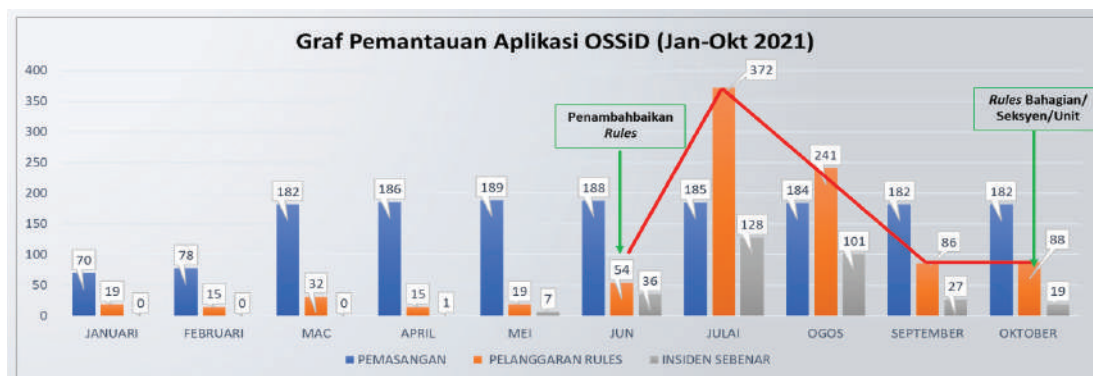
Recorded Cases of Leakage in 2021

Month 2021	Violation Rules Cases	Total of Investigation	Real Incident
Jan	19	19	0
Feb	15	10	0
Mar	32	3	0
Apr	15	15	1
Mei	19	11	7
Jun	54	50	36
Jul	372	320	128
Aug	241	234	101
Sept	86	86	27
Oct.	88	87	19
Total	941	835	319

During the trial period, few non-compliances with the DLP rules were detected as the detections were based on generic rules. The DLP rules were revised in June 2021, which resulted in improved detection of rule violations in July 2021, as shown in Figure 2.

Figure 2

Violations of DLP rules



Based on the number of rule collisions that were detected in July 2021 to September 2021, an investigation was conducted, and it was found that an average of 36 percent of the detections were real incidents. The DLP rules were further improved in September 2021, reducing the number of detected information leakage incidents to 26 percent.

Apart from improving DLP rules, personnel involved in DLP rule violations were given ongoing training and acculturation programs in handling classified information, which has reduced the number of DLP rules non-compliance detection.

CONCLUSION

The government is always concerned with the issue of information leakage, especially those involving official government secret information, either physically or electronically. The instructions and regulations developed and circulated by the relevant parties are sufficient to reduce the risk of leakage of government information.

The use of ICT technology cannot prevent information leakage. Nevertheless, using ICT technology will help the government enforce the rules that have been set. Continuous education and acculturation program for civil servants is important to increase awareness and skills in handling official government secret information. Accordingly, the awareness management program for all civil servants is very important to teach correct practices in information management towards reducing the risk of government information leakage.

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INTEGRATING DIGITALIZATION INTO SUSTAINABLE DEVELOPMENT TOWARDS ACHIEVING SUSTAINABLE DEVELOPMENT GOALS IN THE MARITIME INDUSTRY IN MALAYSIA

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ABSTRACT

The maritime sector plays an important part in Malaysia's economy, facilitating international trade, resource utilisation, transportation, and supporting the various sectors. Its alignment with Sustainable Development Goals (SDGs) and digitalisation has developed as a cogent incentive for modernisation and productivity within the maritime industry. This study emphasises the challenges and opportunities within the integration of SDGs, digitalisation and the maritime sector in Malaysia. Further, it explores how the amalgamation of SDGs, digitalisation, and the maritime sector of Malaysia can contribute to sustainability in the world. It also analyses the possible advantages of digitalisation, like artificial intelligence and the Internet of Things (IoT) –which can enhance transparency, improve operational effectiveness, and increase accountability in the maritime industry of Malaysia. The challenges, such as data privacy concerns, cyber security risks, and interoperability issues, relate to digitalisation in Malaysia's maritime sector. These challenges are very important to dealing with the effective integration of digitalisation sustainable development towards achieving SDGs in the maritime industry of Malaysia. In this way, the maritime sector of Malaysia can reduce emissions, optimise processes, and uphold sustainable resource management. The study employs a qualitative methodology, utilising desktop analysis to extract substantial information. Moreover, unobtrusive methods, including conceptual analysis and document analysis, are used in this perspective. It finds that there is significant potential for integrating digitalisation approaches in the maritime sector of Malaysia to achieve SDGs. It also discloses that many economic prospects and competitive benefits can arise from integrating sustainability and digitalisation in the Malaysian maritime sector due to an intricate interaction of economic, environmental, and social variables.

Keywords: Sustainable development, digitalisation, maritime sector, economic development, challenges.

INTRODUCTION

In the last decades of the twenty-first century, the adoption of digital and how institutional and economic systems organise and carry out tasks in the face of ever-more complex and uncertain settings has fundamentally changed. For instance, the current COVID-19 pandemic has encouraged enterprises to digitise their operational processes more than ever. Although digital platforms are not new, little is known about how these platforms might improve policy integration in public service (Onyango & Ondiek, 2021). The current task investigates this situation regarding digitalisation and incorporating the Sustainable Development Goals (SDGs) in Malaysia's maritime industry.

The movement of goods, people, and ideas between continents is made possible largely due to the marine sector, which forms a crucial cornerstone of global connectivity and trade. The marine industry is of utmost significance to Malaysia's economic growth and sustainability, considering the country's strategic geographic location and long coastline. The integration of Malaysia's maritime sector with more general sustainable development

concepts and the achievement of the Sustainable Development Goals (SDGs) of the United Nations- is a result of an intricate interaction of economic, environmental, and social variables.

The history of Malaysia's marine heritage goes back to when it was a vibrant commercial centre along historic trade routes (Arbi, 2021). The South China Sea and the Straits of Malacca, two of the country's coastline regions, have historically served as domestic and foreign trade lanes. The maritime industry in Malaysia today includes a wide range of activities, such as fishing, offshore development of oil and gas, marine tourism, and maritime education. Its maritime sector - acts as a hub for trade and investment activity and makes a considerable economic contribution (Mohd Daud, 2023). Malaysia has developed into an important transshipment hub in the Asia-Pacific region because of its wide network of ports, harbours, and maritime infrastructure – which connects key economies and makes transporting goods through the international supply chain easier for the population can find work in the maritime industry including jobs for dockworkers, seafarers, logistics specialists, and marine engineers.

As Malaysia joins the international community in its pursuit of sustainable development, the marine sector becomes increasingly important to achieve the SDGs (Ridzuan et al., 2022). The marine industry's potential directly contributes to several of these goals, particularly SDG 9: Industry, Innovation, and Infrastructure and SDG 14: Life Below Water, highlighting the sector's significance. The implementation of sustainable practices within the maritime sector, from sustainable shipping operations to the preservation of marine ecosystems, presents a chance to balance environmental stewardship and economic growth.

Against this backdrop, the present study explores how digitisation and sustainable development interact in Malaysia's maritime sector. The integration of digital technologies with sustainable practices appears as a crucial path to achieving economic growth and environmental resilience as the country navigates the difficulties of a fast-changing global context. This study aims to provide light on solutions that can direct Malaysia toward achieving its sustainable development ambitions in the maritime domain by exploring the complex interplay between digitalisation, sustainable development principles, and the distinctive characteristics of the maritime sector.

METHODOLOGY

This study adopts the qualitative method and utilises desktop analysis as its primary approach. In the context of Malaysia's maritime industry and its connection with the Sustainable Development Goals (SDGs), the study aims to investigate the complex integration of digitalisation. In order to critically assess the current state of digitalisation initiatives, their impact on sustainable development in the maritime sector, and the extent to which they contribute to the achievement of SDGs in Malaysia. This research thoroughly examined the existing literature, policy documents, industry reports, and relevant data sources using desktop analysis. This method has given scholars, policymakers, and industry stakeholders a comprehensive grasp of the intricate relationships between digitisation and sustainable growth in the maritime sector.

LITERATURE REVIEW

Technological advancements have been impressive since the Industrial Revolution in the 1760s (Schmarzo, 2017). The invention of electricity, which facilitated mass production, marked the revolution at the beginning of the 20th century. When personal computers and the internet were first introduced in the 1960s, computer technology helped to form the third industrial revolution. The high levels of artificial intelligence, internet, information, networks, and machine learning are already defining characteristics of the fourth and last industrial revolution (Schwab, 2016). Governments, non-profit organisations, the corporate community, and consumers have all been impacted equally by the third age of digital

transformation and difficulties (Rouse, 2005; Schwab, 2016). According to Schmarzo (2017), this generation of digital transformation strives to increase efficiency in production, service delivery, risk management, and the discovery of new monetisation opportunities globally.

The maritime industry is a crucial pillar of Malaysia's economic growth since it links the country to international trade networks and makes travelling around the nation's borders easier for people, products, and services. It is essential to Malaysia's economy, creating a large contribution to both the GDP and volume of trade. Malaysia is well-positioned to take advantage of the maritime industry's potential because of its 4,600 kilometres of coastline and advantageous location along important shipping lanes (Azaman et al., 2023). The sector includes various industries, such as shipping, port management, ship construction, logistics, and maritime services. Malaysia's ports act as important entry points for international trade, facilitating the movement of commodities to and from nearby nations and markets worldwide. The industry's diversity highlights its strategic, economic, and employment importance to the country.

The significance of Malaysia's strategic location, wide range of components, and contributions to commerce. The development of the maritime industry becomes a crucial case study as Malaysia aims to use digitalisation for sustainable development. The industry's transition to technology-enabled sustainability will impact its operational effectiveness and Malaysia's commitment to reaching the Sustainable Development Goals and the country's broader sustainable development strategy (Raihan & Tuspekova, 2022).

Researchers and experts explore the transformative potential of technology adoption on all elements of sustainability (Ali et al., 2023). They have paid close attention to the marine industry's progress towards digitalisation (Ichimura et al., 2022). Previous studies have demonstrated digitalisation's revolutionary effects on the maritime sector's operational environment. Such studies highlight how technologies like IoT and AI alter conventional wisdom and spur innovation (Jović et al., 2022). These innovations promise a more sustainable maritime ecology through improved monitoring, data-driven decision-making, and process optimisation.

Many scholars emphasise how digitalisation boosts maritime industry performance (Subasinghe, 2023). According to Bobylev et al. (2018), automation, predictive analytics, and real-time data collecting expedite processes and result in lower fuel consumption, fewer emissions, and better resource use. SDG 12 (Responsible Consumption and Production) and SDG 9 (Industry, Innovation, and Infrastructure) are aided by this optimisation. Investigations into the effects of digitalisation on ports and logistics reveal the potential for considerable improvements in supply chain management. Digital technology is included in smart port initiatives to speed up cargo transportation, storage, and vessel turnaround times. These programs support SDG 9 and highlight the sector's contribution to promoting sustainable commerce (Jones et al., 2017).

Research on environmental sustainability highlights digitalisation as a method for reducing the negative impacts of the maritime industry's significant ecological impact (Kechagias et al., 2022). By encouraging responsible behaviour and maintaining marine ecosystems, monitoring systems, real-time reporting, and emissions, reduction technologies support SDGs 13 (Climate Action) and 14 (Life Below Water). Although digitalisation has enormous potential, studies often highlight difficulties and roadblocks preventing seamless integration. These difficulties include problems with data interoperability, worries about cyber security, opposition to change, and the requirement for substantial investments (Bertini, 2016). To realise the full potential of digitisation for sustainable development, these issues must be resolved in this pattern.

The necessity of legislative and regulatory frameworks to support digitalisation while maintaining sustainable practices is emphasised by research (Burri, 2023). According to Koh et al. (2022), flexible legislative frameworks are needed to promote technology adoption, solve data privacy issues, and reward innovation. SDG 17 (Partnerships for the Goals) and the cooperative strategy required for successful integration are supported by such measures.

Concepts and Principles of Sustainable Development

Sustainable development is a fundamental pillar of global efforts to achieve a harmonious balance between economic progress, social well-being, and environmental stewardship. According to the Brundtland Report (1987), sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” This definition emphasises the obligation of future generations to protect natural resources, advance social justice, and guarantee long-term economic growth.

Three interrelated pillars are frequently used for conceptualising sustainable development (Jones et al., 2017). The first is economic sustainability, which emphasises preserving and improving economic prosperity while preventing resource depletion and adverse environmental effects. Responsible resource management, innovation, and fair benefit distribution are required for economic sustainability. Second, social equity acknowledges the significance of equitable and just communities where everyone has access to necessities like education, healthcare, and chances for both personal and professional development. Reducing inequalities and promoting inclusivity is necessary for social fairness. Environmental stewardship, the last pillar, protects ecosystems, biodiversity, and natural resources. It calls for reducing pollution, saving energy, and lessening human activity's effects on the environment (Jones et al., 2017).

The Sustainable Development Goals (SDGs), endorsed by the UN in 2015, offer a worldwide framework for addressing urgent social issues and promoting sustainable development (Sachs, 2016). The SDGs, which have 17 goals and 169 objectives - address a wide range of concerns such as poverty, hunger, health, and gender equality, as well as clean water and climate change. The marine sector is crucial to attaining many SDGs, especially those about life below the ocean (SDG 14), responsible consumption and production (SDG 12), and sustainable infrastructure (SDG 9). The maritime industry may aid in achieving these international objectives by incorporating digitisation into sustainable development methods (Caliskan, 2022).

The sustainable development principles stand out in the context of the maritime industry, like i) environmental compliance, which follows to international environmental guidelines, such as the regulations of International Maritime Organization's (IMO), which is minimizing the impact of maritime industry on the oceans and marine ecosystems; ii) Efficiency and innovation, which holds technological modernization, such as digitalization, reduces emissions, enhances an operational efficacy, and reduces the waste generation; iii) Stakeholder engagement, which includes the different stakeholders, including governmental and non-governmental bodies, industry players, and local communities, with assurance that sustainable development approaches give wide-ranging perspectives and priorities; and iv) Capacity building develops a skilled and knowledgeable workforce that recognizes the principles of sustainable development and digitalization is an important for driving progress (Nömmela & Kõrbe Kaare, 2022).

As Malaysia's maritime industry begins its path toward digitisation, sustainable development, with its comprehensive approach spanning economic, social, and environmental variables, provides a framework for development (Ahmad, 2023, June 6). The marine industry can improve operational efficiency and contribute to a resilient, equitable, and ecologically conscientious future by coordinating digital activities with sustainability principles and the SDGs' goals.

A rising amount of research on the maritime industry's digitisation and its effects on sustainable development indicates the growing acceptance of technology's ability to influence society (Onyango & Ondiek, 2021). Digital technologies have promised to further sustainable development objectives, from operational efficiency to environmental stewardship. However, there would be difficulties to overcome to fully realise the benefits of digitisation for the marine sector's sustainable future. This would require cooperation from stakeholders, governments, and industry participants.

Significance of Sustainable Development and the SDGs

Aiming to balance economic growth, equity in society, and environmental protection, sustainable development has become a guiding principle for countries worldwide (Sachs, 2016). Sustainable development surpasses the conventional approaches to development by emphasising long-term sustainability and inclusion. It is based on the knowledge that the well-being of the present and future generations is tied to the planet's health. The triple bottom line—pursuing economic prosperity, equitable society, and environmental integrity—is at the heart of sustainable development (Hammer & Pivo, 2017). This three-pronged strategy acknowledges that the preservation of ecosystems, a reduction of inequality, and the wise use of resources are all essential to ensuring human well-being. It calls for policymakers, businesses, and communities to adopt comprehensive plans that prioritise sustainable practices and ensure that economic gains are not made at the expense of social and environmental well-being. This paradigm shift challenges traditional ideas of development.

The Sustainable Development Goals (SDGs) of the United Nations are essential to the worldwide pursuit of sustainable development. The SDGs acknowledge the complex interconnectivity of issues that transcend national boundaries and constitute a singular convergence of global ambitions (Persaud & Dagher, 2021). The objectives highlight the value of international cooperation and collaboration in addressing difficult problems with various facets. The marine sector, a global connection and trade hub, is essential for furthering the SDGs.

With its diverse operations, the marine sector has the potential to significantly contribute to fulfilling the SDGs. SDG 9 emphasises the value of resilient infrastructure, inclusive and sustainable industrialisation, innovation, promotion, and so forth. This objective is supported by creating effective and sustainable port infrastructure, adopting environmentally friendly shipping methods, and incorporating cutting-edge technologies into maritime operations. Like SDG 13, the maritime industry strongly supports SDG 14, which focuses on conserving and sustainably using the oceans, seas, and marine resources (Ridzuan et al., 2022). The industry's dedication to minimising marine pollution, maintaining marine ecosystems, and promoting sustainable fishing methods can help keep the oceans safe for current and future generations.

Alignment with sustainable development concepts and pursuing the SDGs become the crucial elements of Malaysia's marine industry's growth trajectory as it navigates the challenges of the 21st century. The maritime industry can protect its economic future and contribute to a more just, ecologically conscious, and successful society by embracing sustainable practices, encouraging innovation, and implementing inclusive policies.

Relationship between Digitalization and Sustainable Development

Digitalisation and sustainable development meet in a dynamic space that can profoundly impact businesses, economies, and communities. To accomplish sustainable development goals, digitalisation can be defined as incorporating digital technologies into the various operational and decision-making processes (Bhutani & Paliwal, 2015). The ability of digital technologies to increase productivity, optimise resource use, and encourage informed decision-making is the basis of this synergy.

The potential of digitalisation to streamline operations, automate routine duties, and enhance overall operational efficiency offers tremendous opportunities for the maritime industry. Real-time monitoring, preventive maintenance, and supply chain optimisation are made possible by Internet of Things (IoT) sensors and artificial intelligence (AI) algorithms (Fruth & Teuteberg, 2017). Digital technologies for resource management accurately handle resources, decreasing waste, energy use, and pollution. Smart technologies enable ships to manage water from ballast tanks more efficiently, measure emissions, and optimise fuel consumption, aligning with SDGs 13 (Climate Action) and 14 (Life Below Water) and at the same time, it enables stakeholders to make sound decisions by providing decision-

making data via digital technologies. SDG 9 (Industry, Innovation, and Infrastructure) can be furthered through effective resource allocation, risk assessment, and strategic planning, all made possible by accurate and timely information (Onyango & Ondiek, 2021).

However, issues like the digital divide and cyber security exist in the relation between digitisation and sustainable development. Uneven digital infrastructure and access discrepancies can worsen inequalities and make it more difficult to distribute benefits fairly (Schia & Willers, 2020). The risk of breaches and data privacy violations increases as cyber security and data privacy become more prevalent (Papastergiou et al., 2020). To stop hostile operations and secure sensitive information, adequate protections are required.

Integration of Digitalization with SDGs

By improving information sharing, monitoring, and reaction procedures, the integration of digitalisation with the SDGs can potentially change marine security (Onyango & Ondiek, 2021). Global stability depends on maritime security, which has consequences for trade, environmental protection, and human well-being (Otto, 2020). Ocean, sea, and marine resource conservation and sustainable use are the goals of SDG 14. As we move closer to this objective, integrating digital technologies offers creative solutions to problems with marine security. Three key SDGs for digitisation can be combined:

SDG 9 (Industry, Innovation, and Infrastructure): By encouraging innovation, improving infrastructure, and spurring economic growth through technology-enabled efficiencies, digitalisation aligns with this objective. SDG 11 (Sustainable Cities and Communities): By boosting urban mobility, decreasing traffic, and streamlining transportation logistics, digitalisation can support sustainable urbanisation. SDG 17 (Partnerships for the Goals): To effectively use digitalisation to advance sustainable development goals, all stakeholders from business, government, and civil society must work together.

The symbiotic relationship between digitalisation and sustainable development presents the chances for Malaysia's marine sector to improve its operations, increase efficiency, and contribute to more general socioeconomic and environmental goals. It is crucial to strike a balance between sustainability challenges and technology's advantages as the sector moves toward digitalisation. Malaysia's marine industry would become a beacon of progress that navigates the uncharted waters of technology-enabled sustainability by utilising the potential of digitalisation through the principles of sustainable development.

Role of Digitalization in Advancing Sustainable Development

Digitalisation has the potential to magnify the effects of initiatives aimed at promoting economic growth, social well-being, and environmental protection as the globe works to address the problems of sustainable development (George et al., 2021). Industries can reorganise processes, maximise resource usage, and stimulate innovation by leveraging the potential of digital technologies. Digital technologies like the Internet of Things (IoT) and artificial intelligence (AI) are integrated into the current processes and systems as part of digitalisation. This connection increases efficiency and accuracy across several industries (George et al., 2021).

Real-time data gathering, analysis, and interpretation are made easier by digitalisation. This data-driven methodology facilitates sensible choices across industries. It cultivates a setting that encourages innovation and teamwork. Professionals from many areas can collaborate on projects, share ideas, and co-create solutions through online platforms and virtual networks. The concept of open-source technologies, where people unite to develop software and tools to address common problems, is an example of this collaborative mentality (Sanchez-Gonzalez et al., 2019). Digitalisation hastens the achievement of numerous SDGs by encouraging innovation and knowledge sharing.

Geographical boundaries are no longer a barrier to accessing services and information thanks to digitalisation. Its function is to promote sustainable development in many

industries. Industries can make considerable progress toward attaining the SDGs by utilising digital technology to streamline operations, spur innovation, and encourage ethical behaviour. In the maritime sector of Malaysia, the integration of digitalisation within sustainable development initiatives- stands as a promising pathway for navigating the complex challenges of the modern era, as explored in the following sections of this study.

RESULTS AND DISCUSSION

As it transitions to a new era of digitalisation, the marine industry is going through a significant upheaval. The marine sector in Malaysia is actively integrating digital technology to transform operations, improve efficiency, and solve environmental concerns in the quest for sustainable development and the realisation of SDGs. With the help of smart ports and automated operations, the marine industry is advancing towards sustainability and playing a part in reaching the SDGs. Digitalisation trends are being led by smart ports, which use automation and Internet of Things (IoT) technologies to optimise operations. These ports have sensor networks that can gather real-time information on ships, cargo, and infrastructure. Automated cranes, self-driving cars, and sophisticated inventory management systems accelerate turnaround times and streamline freight processing. Smart ports support SDGs 9 (Industry, Innovation, and Infrastructure) and 12 (Responsible Consumption and Production) by increasing efficiency and consuming less energy.

The creation makes real-time monitoring, analysis, and simulation of virtual replicas of actual assets using digital twin technology. This technology is used on ships, ports, and supply chain networks in the marine industry. Digital twins optimise vessel performance, anticipate maintenance requirements, and enhance safety by modelling different scenarios. SDG 14 (Life Below Water) is another goal supported by digital twins, making it easier to monitor ship emissions and safeguard marine habitats. Data analytics integration enables the maritime industry to make knowledgeable decisions based on data-driven insights. By predicting equipment breakdowns, predictive maintenance lowers downtime and maintenance costs. Machine learning algorithms power it. Real-time data feeds enable proactive decision-making, allowing for the optimisation of vessel routes to lower emissions and fuel consumption. These programs support sustainable maritime operations and lessen the environmental impact of the sector, which are in line with SDGs 13 (Climate Action) and 14 (Life Below Water).

Satellites and other remote sensing devices like drones are essential for improving maritime domain awareness. These technologies make real-time monitoring of ship movements, pollutant levels, and even marine biodiversity possible. Remote sensing helps with search and rescue operations, safety improvements, and the fight against maritime crime like people trafficking and illegal fishing. This encourages sustainable maritime practices that encourage wise resource use and is consistent with SDG 16. Adopting digitalisation trends is closely tied to the maritime industry's journey toward sustainable development. Digital technology integration is essential to achieving the interconnected objectives of efficiency, safety, and environmental stewardship as Malaysia develops its maritime industry.

Digitalization Projects in Malaysian Ports

The maritime ecosystem in Malaysia is undergoing a wave of digitalisation initiatives that touch ports, shipping firms, logistics service providers, and allied industries. These initiatives redefine industry norms, improve operational effectiveness, and support the country's sustainable development objectives. These sectors have seen some notable digitisation initiatives that demonstrate Malaysia's dedication to developing its maritime industry, including:

Digital Port Operations

Port Klang's Smart Port Transformation: With its smart port transformation effort, Port Klang, the busiest port in Malaysia, is setting the bar for digitalisation. To streamline operations,

the initiative combines IoT devices with real-time data analytics and predictive modelling (Hup, 2020). This project increases efficiency and supports SDG 9 (Industry, Innovation, and Infrastructure) by improving vessel traffic management, cargo handling, and berth allocation.

Automated Cargo Handling

Automated Terminal Operations at PTP: The Port of Tanjung Pelepas (PTP) has embraced automation in its terminal operations. Remote-controlled ship-to-shore cranes, automatic stacking cranes, and automated guided vehicles improve cargo handling effectiveness while minimising human involvement (Bruno, 2022, June 26). These developments help SDG 9 and SDG 7 (Affordable and Clean Energy) by reducing energy use and emissions. They also align with SDG 9.

Logistics Data Exchange

National Logistics Data Exchange (NLDE): The NLDE platform in Malaysia makes data sharing amongst logistics players easier. NLDE improves efficiency while lowering wasteful resource use by enabling real-time sharing of shipment information, route optimisation, and inventory management (MIDA, 2021, April). SDG 12 (Responsible Consumption and Production) and SDG 17 (Partnerships for the Goals) are supported by this program.

Smart Fleet Management

Digitisation of Fleet Operations: In Malaysia, shipping firms embrace technology to improve fleet management. To improve fuel efficiency and lower emissions, advanced fleet management systems combine GPS tracking, route optimisation, and real-time monitoring (Kafi et al., 2022). These actions help lessen the industry's environmental impact and align with SDG 13 (Climate Action).

Blockchain for Traceability

Blockchain for Fisheries Traceability: Blockchain is used in the context of sustainable fishing methods to improve traceability in the seafood supply chain. Malaysia's fisheries industry has adopted blockchain technology to maintain transparency in the source and distribution of seafood products (Loke & Ann, 2020). This program encourages ethical and legal fishing methods in support of SDG 14 (Life Below Water).

e-Customs and Trade Facilitation

National Single Window (NSW) for Trade: Through digitalisation, Malaysia's NSW project improves customs procedures, reducing paperwork and accelerating cargo clearance (Remali & Harun, 2018). This effort supports SDG 9 and encourages sustainable economic growth by reducing administrative red tape and improving trade facilitation.

Digital Skills Training

Digital Skills Training Programs: Training initiatives are being started to provide maritime workers with digital skills in recognition of the demand for a trained workforce (Bakar, 2021, November 2). By encouraging lifelong learning and employability, these efforts support SDGs 4 (Quality Education) and 8 (Decent Work and Economic Growth) and ensure that the workforce can successfully handle digitalisation projects.

Digitalisation initiatives at Malaysian ports, shipping firms, logistics service providers, and allied industries highlight the sector's dedication to sustainable growth and innovation. These programs use technology to increase productivity, lessen their negative effects on the environment, and foster teamwork. The marine sector in Malaysia is establishing itself as a role model for the global maritime industry by fusing digitalisation with sustainable practices. This sector shows how fusing technology and sustainability would result in a robust and prosperous future.

Advantages and Challenges of Integrating Digital Technologies in Maritime Operations

The application of digital technologies to maritime operations in Malaysia results in various advantages and difficulties that influence the sector's evolution. It's crucial to comprehend these benefits and challenges as the industry works to connect with sustainable development goals and the achievement of the SDGs. Here, we examine the wide range of advantages and challenges- brought about by applying digital technologies to maritime operations.

We have found four leading advantages of integrating digital technologies in the maritime operations of Malaysia:

1. Enhanced Efficiency and Productivity

By automating procedures, enhancing navigation, and better-allocating resources, digital technologies streamline maritime operations. Automation lowers human error rates, and data-driven decision-making increases effectiveness, leading to higher production across all maritime industry segments. These efficiencies support innovation and effective logistics, which are the goals of SDG 9 (Industry, Innovation, and Infrastructure).

2. Environmental Sustainability

By lowering energy use and emissions, integrating digital technologies promotes environmental sustainability. Fuel savings and pollution reductions are possible via real-time data analytics, predictive maintenance techniques, and optimised vessel itineraries. These initiatives, which aim to reduce the environmental impact of the maritime sector, are directly in line with SDGs 13 (Climate Action) and 14 (Life Below Water).

3. Safety and Security

Digitalisation improves marine safety by providing real-time information on vessel movements, weather patterns, and navigational routes. This information helps prevent crashes and ensures the safety of the crew. Digital technologies also make it possible to take greater security precautions, which lowers the risk of piracy, smuggling, and other criminal actions. SDG 3 (Good Health and Well-Being) and SDG 16 (Peace, Justice, and Strong Institutions) are influenced by increased safety and security.

4. Transparency and Traceability

Blockchain and other digital technologies ensure transparency and traceability throughout the maritime supply chain. Authentic and unchangeable records stop fraud and unethical behaviour, supporting ethical sourcing and lowering the dangers of illegal trading. By promoting ethical and responsible behaviour, these initiatives support SDGs 12 (Responsible Consumption and Production) and SDGs 16.

Here are five leading challenges of integrating digital technologies in the maritime operations of Malaysia:

1. Technological Barriers

Significant infrastructure, hardware, and software investments are needed to integrate digital technology. The requirement for technological updates, compatibility difficulties, and legacy systems present obstacles to seamless integration. Removing these obstacles necessitates financial resources and a calculated strategy to implement new technologies.

2. Cyber Security Risks

The vulnerability to cyberattacks grows as digitalisation develops. Data breaches, malware attacks, and other cyber security risks can affect maritime operations. A complicated task that demands effective cyber security measures is preventing and compromising sensitive data and vital systems.

3. Workforce Adaptation

The shift to digital operations necessitates a workforce knowledgeable and adept at

employing cutting-edge technologies. Training and upskilling programs are crucial for giving marine workers the skills to use digital platforms effectively. The problem of balancing the need for technological proficiency with domain knowledge calls for extensive training activities.

4. Data Privacy and Ownership

Data sharing and interchange amongst stakeholders is a prerequisite for digital technology. To retain confidence and cooperation, it is essential to ensure data privacy, consent, and ownership rights. It can be difficult to navigate the complicated legislative landscape of data privacy, which calls for explicit rules and agreements.

5. Overdependence on Technology

Digitalisation has many advantages, yet relying too heavily on technology might leave one vulnerable to hacks or system failures. Operational resilience is ensured by balancing manual backup procedures and digital processes.

The application of digital technologies to maritime operations in Malaysia results in a variety of advantages and challenges that have an impact on the future of the industry. While digitalisation improves productivity, sustainability, and security, it also calls for managing technological hurdles, cyber security threats, workforce adaptation, data privacy, and operational resilience. Malaysia's maritime sector can exploit the revolutionary power of digital technology while guaranteeing sustainable and resilient operations that help to achieve the SDGs by carefully navigating these issues.

Alignment of Digital Initiatives with Specific SDGs

Integrating digital initiatives into Malaysia's maritime industry creates a potent synergy between the growth of technology and the achievement of particular SDGs. These digital efforts are deliberately matched with specific SDGs, advancing the marine industry toward a technologically cutting-edge and socially responsible future as the sector works to contribute to sustainable development. Here, we emphasise how important digital activities correlate with pertinent SDGs, illuminating how technology-driven measures can encourage sustainable results:-

1. SDG 9: Industry, Innovation, and Infrastructure

Smart Port Transformation: By fostering innovation, promoting efficient infrastructure, and boosting the sector's operational resilience, the development of smart ports with real-time monitoring, data analytics, and predictive modelling is in line with SDG 9.

2. SDG 7: Affordable and Clean Energy

Automated Terminal Operations: Energy efficiency is improved, and incorporating computerised technologies in port operations, such as ship-to-shore cranes and automatic stacking cranes, supports SDG 7.

3. SDG 13: Climate Action

Data-Driven Decision-Making: In direct support of efforts to mitigate climate change and in line with SDG 13, digital technologies allow data-driven decisions that optimise vessel itineraries, lower fuel consumption, and limit emissions.

4. SDG 14: Life Below Water

Blockchain for Fisheries Traceability: Enhancing traceability in seafood supply chains with blockchain encourages ethical fishing methods, reduces illicit fishing, and meets SDG 14 by protecting marine ecosystems.

5. SDG 16: Peace, Justice, and Strong Institutions

Enhanced Maritime Security: Initiatives related to digitalisation increase maritime domain awareness, lower the danger of piracy, and strengthen security protocols, all of which support SDG 16 by fostering safe and tranquil maritime environments.

6. SDG 12: Responsible Consumption and Production

Blockchain for Supply Chain Transparency: By ensuring openness and accountability in supply chains and encouraging responsible consumption and production, blockchain technology supports SDG 12.

7. SDG 8: Decent Work and Economic Growth

Digital Skills Training: Initiatives aimed at educating marine workers in digital technologies are consistent with SDG 8 since they promote fair employment opportunities, improve employability, and promote economic growth.

8. SDG 17: Partnerships for the Goals

Collaborative Platforms: By encouraging partnerships and boosting sustainable development cooperation, digital platforms that enable real-time collaboration and information exchange among stakeholders support SDG 17.

Malaysia's dedication to fusing technology with sustainable development objectives within the maritime industry is demonstrated through the alignment of digital efforts with certain SDGs. These programs show how digitalisation may spur progress by addressing problems and using opportunities to further the SDGs. These strategic alliances ensure that technology improves efficiency and significantly contributes to the global quest for sustainability as the marine industry navigates the complexities of the digital era (Yusof & Ariffin, 2020, May).

Suppose we generalise all the 7 SDGs as mentioned above. In that case, we understand that Malaysia's maritime industry is blending digitisation and sustainable development as characterised by a complex interaction of challenges and opportunities. Although technological breakthroughs can completely transform industry procedures, getting lasting results necessitates a thorough grasp of obstacles and possible growth areas. Several barriers and difficulties that need careful consideration stand in the way of Malaysia's maritime sector's progress toward incorporating digitalisation for sustainable development. Understanding these barriers is essential to setting a strategy that maximises benefits while minimising dangers as technology becomes increasingly entwined with pursuing sustainable results.

Particularly for small and medium-sized firms (SMEs) in the maritime industry, the financial implications of integrating digital technologies can be a significant barrier. Budgets with limited resources may be strained by the cost of obtaining and implementing new technology infrastructure, educating the personnel, and negotiating the learning curve. The adoption of digital initiatives may be hampered by limited financial resources, resulting in differences between larger firms and SMEs regarding technology readiness and sustainable business practices.

Technology disparities amongst maritime industry segments may prevent the widespread use of digital technology. The industry comprises various players, from port operators to shipping corporations, all technologically prepared to varied degrees. Its difference may cause uneven progress toward the goals of sustainable development. Specialised strategies that consider the unique requirements and capabilities of various industry sectors are required to close these gaps.

With the advancements in digitisation, concerns about data privacy and cyber security are more pronounced. Data security is crucial because of the delicate nature of maritime operations and the risk of cyber attacks. The operations can be affected, sensitive data might be compromised, and stakeholder trust can be lost due to cyber security breaches. Concerns about data privacy may make people hesitant to support digital efforts that share data. Conversely, navigating the complicated regulatory environment surrounding digitisation and sustainability might be difficult. Legal frameworks that control data exchange, intellectual property rights, and technological standards may need to be modified to account for digital transformations. Investments in digitalisation may be

discouraged by unclear rules, which would hinder the industry's capacity to fully utilise emerging technology for sustainable development.

Opportunities for Collaboration among Stakeholders to overcome challenges

Collaboration emerges as a strong force to overcome the obstacles and capture possibilities as Malaysia's maritime sector navigates the complicated environment of integrating digitalisation for sustainable development. The key to choosing a strategy that optimises the advantages and reduces risks is understanding the interconnection of stakeholders, including everything from government agencies and business actors to academic institutions and civil society. The numerous chances for cooperation can overcome obstacles and lead the industry toward a sustainable and digitally connected future (Othman et al., 2011).

Collaboration between the public and private sectors through PPPs can encourage innovation, the sharing of resources, and collaborative investments. Government organisations and members of the commercial sector can work together to create digital solutions that solve issues unique to each sector. PPPs take advantage of both sectors' capabilities to spur the adoption of new technologies and environmentally friendly behaviours (Sapri et al., 2016). These collaborations hasten the implementation of digital initiatives, increasing their breadth and significance. Knowledge exchange and factors that enhance capability are also necessary. Cooperation between educational institutions, business organisations, and regulatory bodies can facilitate knowledge exchange and capacity building. Training courses, seminars, and workshops can give maritime personnel the skills to adapt to new technologies. The difficulty of workforce preparedness is reduced by a competent staff, which speeds up the integration of digital technology. Initiatives for collaborative learning support sustainable practices and upskill the industry.

Malaysia must also create multi-stakeholder platforms that unite business leaders, government officials, NGOs, and academics to promote communication and consensus-building. These platforms provide forums where people can identify problems, exchange ideas, and provide solutions. Multi-stakeholder platforms offer a comprehensive picture of industry opportunities and challenges, enabling solutions informed by various viewpoints. Collaboration guarantees that choices are well-rounded and consider all parties' interests. The industry clusters and associations would also be meeting places for stakeholders from the maritime sub-segments. These organisations can collaborate on research, development, and innovation initiatives that enhance digitalisation and sustainability. Industry cluster collaboration increases the sector's overall influence. Shared research, data, and expertise pooled allow the expansion of targeted solutions that deal with industry-specific challenges.

Regulatory organisations and industry stakeholders can work together through consultation procedures. By including business leaders in the policy-making process, rules are made realistic, flexible, and supportive of digitalisation and sustainable practices. Regulatory congruence with industry needs promotes an enabling environment for digital projects. Collaboration between regulatory agencies and business representatives leads to efficient regulations that encourage the use of new technologies. Public and private sector organisations might set up innovation funds and grants to assist joint initiatives addressing digitisation and sustainable development. The cross-sectoral cooperation and idea incubation can be encouraged by these funds. Innovation funds promote the creation of original responses to industry problems. Innovation is sparked through collaboration, allowing the industry to use technology for sustainability.

The opportunities for cooperation among stakeholders in the maritime industry in Malaysia transcend borders, advancing the integration of digitalisation and sustainable growth. Stakeholders can work together to address obstacles through public-private partnerships, knowledge exchange, multi-stakeholder platforms, industry associations, regulatory dialogues, and innovation funding. Malaysia's marine industry is well-positioned to pave a path toward a future where digitisation and sustainability are mutually reinforcing by utilising the combined knowledge and resources of the maritime ecosystem.

CONCLUSION

Exploration, innovation, and cooperation have all been the key components of incorporating digitalisation into sustainable growth in Malaysia's maritime industry. This study has shed light on the complex relationship between sustainability and technology, exposing a landscape rife with obstacles, chances, and prospective advancement routes. As we draw to a close, we consider the major discoveries and contributions that have resulted from our investigation into "Integrating Digitalization into Sustainable Development towards Achieving Sustainable Development Goals in the Maritime Industry in Malaysia."

The research has revealed a spectrum of obstacles, from budgetary limitations and compatibility with older systems to cyber security threats and regulatory difficulties. These results highlight the complex nature of integrating digitisation for sustainable development and the need for careful obstacle management.

The study emphasises the ability of stakeholder collaboration to transform. Industry clusters, multi-stakeholder platforms, public-private partnerships, and information exchange all promise to address problems and spur innovation.

A comprehensive regulatory framework that links technological advancement with sustainability goals is essential. To develop an environment conducive to digitalisation, the study emphasises the value of data governance, cyber security standards, technological neutrality, capacity building, and incentives.

The research reveals that technology-driven solutions align with specific SDGs, including (SDG 7) Affordable and Clean Energy, (SDG 8) Decent Work and Economic Growth, (SDG 9) Industry, Innovation, and Infrastructure, (SDG 13) Climate Action, (SDG 14) Life Below Water, and (SDG 12) Responsible Consumption and Production, when looking at successful digital interventions that positively impact sustainable development. These results show that digitalisation is a strong enabler for attaining sustainable development objectives.

This study explores the complicated relationships between digitalisation and sustainable development by delving into the maritime industry's complex landscape. The analysis gives a thorough awareness of the difficulties, possibilities, and synergies. It is also clear that Malaysia's maritime sector has much to gain from incorporating digitalisation into sustainable development. The industry can pave the way for a future integrating technical development with environmental stewardship and economic growth by encouraging collaboration, embracing novel digital solutions, and aligning efforts with SDGs. The research's results and contributions not only shed light on the opportunities and difficulties of the present but also open the door to a new era of development fueled by the fusion of sustainability and technology.

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AUGMENTED VIRTUAL REALITY USER EXPERIENCE: HUMAN-CENTERED APPROACH TO INTERACTION DESIGN

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ABSTRACT

This paper will introduce the overview of virtual reality user experience, including the definition and importance of user experience. Then, it will explore the application of humanistic interaction design theory in virtual reality technology, including how to be human-centred and meet the needs and experiences of users. Next, the steps and case studies of the user-centered design approach will be presented to show how design quality and user satisfaction can be improved through user engagement and feedback.

In order to enhance the virtual reality user experience, this paper will also propose some design strategies. These include improving virtual reality systems' intuitiveness and ease of use, enabling users to get started and operate the system quickly. Users can experience the virtual world more immersive through body perception and natural interaction. Create engaging virtual reality environments through emotional and immersive experiences; Provide an interactive and collaborative experience between users by being social and collaborative.

In addition, this paper will also introduce the evaluation methods of virtual reality user experience, including user surveys, user testing and user observation. Through these evaluation methods, users' satisfaction with and needs for virtual reality systems can be understood, thus guiding design and improvement.

Finally, this paper aims to improve the design and development level of virtual reality technology through research, provide users with a better interactive experience, and promote the wide application and development of virtual reality technology. By combining humanistic interaction design theory and user-centred design methods, the user experience of virtual reality technology can be improved. This can improve user satisfaction and engagement and increase the market competitiveness and application scope of virtual reality technology.

Keywords: Augmented reality; Virtual reality; Humanism; Interaction design; immersion

INTRODUCTION

To achieve these developmental goals, further research and exploration of the assessment methods and indicators of VR user experience are needed. At present, the user experience evaluation of VR mainly relies on qualitative and quantitative methods such as user surveys, user testing and user observation. However, these methods still face some challenges, such as measuring the emotional and immersive experience accurately and solving the movement sickness and dizziness of virtual reality technology. Therefore, future studies can explore more assessment tools and technologies, such as biosensors, eye movement tracking, etc., to comprehensively evaluate the VR user experience.

In short, the user experience of virtual reality can be enhanced through humanistic interaction design theory and a user-centred design approach. Future research should explore the development direction and evaluation methods of virtual reality user experience

to improve the design and development level of virtual reality technology, provide a better interactive experience for users, and promote the wide application and development of virtual reality technology.

Overview of the virtual reality user experience

Overview of VR technology

Virtual reality (Virtual Reality, VR) technology is a technology that simulates the user and the virtual environment. [1] It creates a realistic virtual environment through the three key elements of perception, interaction and display so that users can personally feel the virtual world's existence. In terms of perception, virtual reality technology uses sensors and tracking devices to track the user's head and body movements and the position and posture of the hands and fingers. Users can interact with the virtual environment in real-time through handles, gesture recognition, speech recognition and other ways. On the display side, virtual reality technology uses head-mounted displays or projection devices to display the virtual environment, allowing users to see the virtual world through their eyes.

Virtual reality technology has wide applications in various fields. Virtual reality can provide a more immersive gaming experience in gaming and entertainment, allowing players to play in an immersive way. In education and training, virtual reality technology can create realistic simulation environments to help students and vocational trainers in hands-on operation and virtual experience, improving the learning effect and quality of training. Virtual reality technology can be used in patient rehabilitation training, psychotherapy and pain management in the medical and health fields. In architecture and design, virtual reality technology can help designers and engineers design and simulate in virtual environments, identifying problems in advance and improving design results.

However, the development of virtual reality technology faces some challenges. First, the cost of technology remains a limiting factor, with the high costs of equipment and content development limiting the adoption of virtual reality technology. Secondly, the complexity of virtual reality devices is also a problem, which requires users to set and adjust the cumbersome settings and reduces the user experience. In addition, human-computer interaction and user experience are key issues in developing virtual reality technology. The direction for further research and improvement is how to make users interact with the virtual environment more naturally and comfortably and improve user participation and satisfaction.

With further technology development and application expansion, virtual reality technology is expected to provide a more immersive and rich experience. In the future, VR may be lighter and more portable, and equipment and content development costs are expected to decrease, allowing more users to access and use VR. At the same time, the research on human-computer interaction and user experience will also get more attention to improve user satisfaction and participation. To sum up, virtual reality technology has broad application prospects in different fields. However, it also needs to overcome the challenges of technology and user experience to realise its more significant potential and application value. However, the further development of virtual reality technology also faces some other challenges. [2] First, prolonged use of VR can cause various health problems, such as eye fatigue, dizziness and nausea. These problems may be caused by factors such as inadaptability of the virtual environment, image latency or low resolution. Therefore, how to reduce or eliminate this discomfort has become an urgent problem for researchers and developers to solve.

Secondly, the social impact of virtual reality technology is also worth watching. The immersion and realism of virtual reality technology may lead to the isolation of users from the real world, affecting their social interaction with others and their participation in real life. [3] In addition, virtual reality technology may also cause psychological problems, such as addiction to the virtual world and the loss of interest in the real world. Therefore, it is necessary to strengthen the research on social and psychological effects in the development

and application of virtual reality technology and to develop corresponding policies and guiding principles.[4]

Finally, virtual reality technology's security and privacy issues also need attention. Virtual reality technology often requires access to users' personal information and location data to provide personalised experiences and services. [5][6] However, collecting and using these data may involve the risk of leakage and misuse of user privacy. Therefore, protecting users' personal privacy and data security has become an important issue in the development of virtual reality technology, and relevant laws, regulations, and technical safeguard measures need to be formulated.

To sum up, virtual reality technology has broad applications in various fields. However, it also faces challenges such as technology cost, equipment complexity, human-computer interaction and user experience, health issues, social impact, and security and privacy issues. In order to promote the further development and application of VR technology, enhanced research, improving technology and equipment, formulating relevant policies and regulations, and strengthening user education and awareness are needed. By overcoming these challenges, VR can truly reach its potential and bring humanity a richer and more beneficial experience.

The importance of user experience

Virtual reality (Virtual Reality, VR) as a new interactive technology, user experience (User Experience, UX) is fundamental in its field. User experience directly affects users' satisfaction and acceptance of virtual reality applications. [7] A good user experience can improve users' love for virtual reality applications and increase users' loyalty and recommendation degree, thus indirectly affecting the commercial value and market competitiveness of virtual reality applications.

User experience has an essential impact on virtual reality applications. [8] First, an excellent user experience can improve the availability and efficiency of VR applications. By paying attention to user needs and understanding users' behaviour habits and psychological characteristics, designers can make interface and interaction designs according to their specific needs to improve virtual reality applications' ease of use and operational efficiency. Secondly, humanistic interaction design theory and method can guide the design process of virtual reality applications by paying attention to users' emotions and experiences so that users can get a more accurate and immersive experience in the virtual reality environment. This emotional resonance and immersive feeling can enhance the user's sense of participation and satisfaction, thus improving users' interest and willingness to use virtual reality applications. To enhance VR applications' attractiveness, competitiveness, and commercial value, designers should constantly improve and optimise the user experience. This can be done in many ways. First, designers need to interact and give feedback closely to users to understand their needs and expectations and improve and adjust their products. Secondly, designers can use user research and testing methods to collect user feedback and suggestions, such as a guide for product iteration and upgrades. In addition, designers can also learn from the user experience design experience in other fields, such as game design and human-computer interaction, to improve the user experience of virtual reality applications.

In conclusion, user experience has a vital role in the virtual reality field. By focusing on user needs, adopting humanistic interaction design theories and methods, and constantly improving and optimising the user experience. [9] In future development, the user experience of VR applications will continue to be the focus of attention, and designers need to constantly innovate and improve to meet users' changing needs and expectations.

Challenges of Virtual Reality User Experience

The rapid development of virtual reality provides an immersive experience. However, this technology also presents some challenges. First of all, hardware equipment for user

comfort and convenience requirements. Limitations in virtual reality devices' weight, size, and cables may affect the user experience. As a result, developers need to constantly work to improve their hardware to provide lighter and more comfortable virtual reality devices.

Second, the accuracy and latency of VR devices can also impact the user experience. [10] The device's accuracy determines whether the user's operation in the virtual environment is accurate. At the same time, the delay problem may cause the user to appear to have an obvious delay sense when operating the device, thus reducing the user's immersion. Therefore, developers must continuously improve and optimise the device accuracy and delay issues to provide a smoother and more realistic virtual experience.[11]

Sports sickness perception in virtual reality environments is a common problem. Because virtual reality simulates real scenarios and triggers sensory responses, some users may experience discomfort, such as dizziness, nausea and dizziness, when using virtual reality devices. To solve this problem, researchers need to dig deeper into the causes of exercise sickness and use appropriate technology to reduce or eliminate the discomfort.

Traditional keyboard and mouse interaction modes cannot be realised in the virtual environment, so a new interaction mode needs to be designed. New interaction methods need to interact naturally and flexibly with objects in the virtual environment to improve the user experience. Therefore, developers need to innovatively design and develop new interactive technologies to meet the operational needs of users in a virtual environment.

The graphics and sound quality in the virtual environment directly affect the user's perception of reality.[12]High-quality visual and auditory effects can enhance user immersion and engagement and increase hardware and software requirements. As a result, developers need to continuously improve VR technology's graphics and sound rendering capabilities to provide a more realistic and satisfying audio-visual experience.

VR applications' content and scene design must create attractive and meaningful virtual environments based on user needs and preferences. [13]This requires developers to deeply understand users' needs and preferences and combine the characteristics of virtual reality technology to design a virtual environment that can attract users and provide a meaningful experience.

Moreover, the content and scenarios of VR applications need to be connected to the users' real lives to provide more meaningful and valuable experiences. This requires researchers to combine virtual reality technology with real-life scenarios to create virtual reality experiences that can positively impact real life.

To sum up, solving the challenges posed by virtual reality technology requires comprehensively considering factors such as technology, design, and user needs.[14] Developers need to pay close attention to the VR trends and constantly improve the comfort and convenience of hardware. They need to develop lighter, more comfortable devices and address restrictive issues such as device size and cables to improve user experience.

In addition, developers need to continuously optimise the accuracy and reduce the latency of VR devices. They can provide a more realistic and smooth virtual experience by improving sensor technology and optimising data processing algorithms to enhance device accuracy and reduce latency.

In order to solve the problem of sports sickness in the virtual reality environment, researchers can use various methods. For example, they could improve the display and tracking techniques of virtual reality devices to reduce movement delays in the eyes and head and thus reduce the occurrence of motor sickness. In addition, they can combine the knowledge of psychology and human-computer interaction to design a virtual environment that is more in line with the law of human senses and movement rules to reduce users' discomfort.

In order to solve problems beyond traditional interactions, researchers can explore and

design new interactions. For example, they could develop gesture recognition, voice control, and brain-computer interface technology to provide a more natural and flexible user interaction experience. In addition, they can also combine the physical interaction elements of the natural world to design a more tactile interaction mode to enhance the user's immersion further.

In order to provide a higher quality audio-visual experience, researchers can constantly improve their graphics and sound rendering technology. They can develop higher resolution, more realistic graphics rendering technology, and more spatial and stereoscopic sound rendering technology to enhance the user's sense of reality in the virtual environment.

Finally, developers need to pay close attention to user needs and preferences and integrate them into virtual reality applications' content and scene design. They can collect through user research and feedback to understand users' expectations and intentions for the virtual environment and incorporate these factors into the design process to create a more attractive and meaningful virtual environment.

To sum up, solving the challenges posed by virtual reality technology requires a combination of multiple considerations, including technology, design, and user needs. They need to constantly improve the comfort and accuracy of the hardware devices, design new ways of interaction, optimise the audio-visual experience, and incorporate user needs and preferences into the design of the virtual environment to provide a better virtual reality experience.[15]

The Humanistic Interaction Design Theory

The basic principles of humanistic interaction design

Humanitarian interaction design is a human-centred approach focused on user needs, behaviours, and experiences.[16]In this design approach, designers need to gain insight into the user's needs, goals, and expectations to ensure that the design can genuinely meet the user's actual needs. To this end, designers need to obtain user feedback and demand information by observing user behaviour and conducting user research and user interviews.

The basic principles of humanistic interaction design include focusing on user needs, user participation, user experience, user diversity, and iterative design process.[17]Focusing on the user's markets means that designers must understand them and use them as a core guide to the design. The emphasis on user engagement means that designers should have frequent communication and feedback with users to understand their thoughts and reactions and involve users in the design process. Focusing on user experience means that designers should strive to create a positive, enjoyable, and meaningful user experience by providing a concise, intuitive, and easy-to-use interface and considering the user's emotions and context. Highlighting the diversity of users means that designers should consider the variety of users and offer flexible and customisable design options to meet the needs of different user groups. The iterative design process means that designers should constantly collect user feedback, evaluate the effectiveness of the design, and make improvements accordingly. Such an iterative design process can help designers better understand user needs and provide a better user experience.

In humanistic interaction design, designers must use various tools and methods to realise the above principles. For example, designers can use user journey maps, character models, and storyboards to understand user needs and behaviour. Designers can also use prototyping and user testing methods to verify design feasibility and effectiveness. By applying these tools and techniques, designers can better understand the needs and expectations of users and translate them into specific design solutions.

In short, humanistic interaction design is a design method that focuses on user needs, emphasises user participation, emphasises user experience, and emphasises user diversity and iterative design process. In practice, designers need to deeply understand users'

needs, conduct frequent communication and feedback with users, strive to create a positive, pleasant and meaningful user experience, and constantly collect user feedback and evaluate the effects of the design to provide a better user experience.

Application of Humanistic Interaction Design in Virtual Reality

Humanitarian interaction design is a human-centred design approach designed to create a more humane and pleasant user experience. In the field of virtual reality, humanistic interaction design can enhance users' perception and engagement in the virtual environment. By emphasising user participation and a sense of involvement, humanistic interaction design meets user needs by designing intuitive and easy-to-use interfaces and encouraging user participation in the design process.

Humanistic interaction design focuses on users' emotional and immersive experiences and enhances their immersion and emotional experiences by designing realistic virtual scenes, sound effects, and tactile feedback. In a virtual reality environment, this design method can create a more realistic virtual experience by simulating the sensory experiences of the natural world, such as vision, hearing, and touch. This immersive design can make the user feel immersive, increasing their sense of participation and emotional input.

In addition, humanistic interaction design also emphasises social interaction and collaboration, promoting cooperation and exchange between users by designing virtual environments that support multi-person collaboration. In virtual reality, people can interact with other users in real time through devices such as virtual headsets and gamepads and explore the virtual environment together, increasing the possibility of social interaction. This design approach can facilitate collaboration and communication between users to enhance the social and collaborative experience.

The application of humanistic interaction design in virtual reality can enhance users' sense of participation, emotional experience, and sociability and create a more humane and pleasant user experience. By designing interaction methods and interfaces that are closely related to user needs, humanistic interaction design can meet their personalised needs and improve user satisfaction and loyalty. In addition, it can also provide users with a more accurate and rich experience, thus enhancing their acceptance and willingness to use virtual reality technology.

With the development of virtual reality technology, humanistic interaction design has a broad application prospect in the field of virtual reality. The continuous innovation and progress of virtual reality technology provide designers with more possibilities to design more realistic, immersive, and social virtual experiences. Humanist interaction design will continue to play an essential role in the field of virtual reality, providing users with a better experience and designing solutions to meet their needs.

Virtual Reality Interaction Design Method of The User Center

User Requirements Analysis

User needs analysis is one of the critical steps in VR interaction design, which aims to identify and understand the needs and expectations of users for VR systems. In order to accurately obtain user-specific information, designers need to use a variety of methods for research and analysis.

First of all, user research and interviews are essential means to obtain user needs. Through face-to-face communication with users, designers can gain insight into users' habits, preferences, and expectations and their real needs. In addition, observing users' use behaviour and feedback is also an effective way to obtain demand information. By following the user's operation and response in the virtual reality environment, designers can find the user's pain points and room for improvement.

Secondly, literature research, market research, and competitive product analysis are also important ways to determine user needs. By studying relevant literature, designers can learn about the latest development and application scenarios of virtual reality technology so as to provide a reference for demand analysis. Market research and competitive product analysis can help designers understand the characteristics and needs of the target user groups, as well as the existing related products and solutions on the market.

In the process of user needs analysis, designers need to classify and sort out the collected user needs. Utilising demand analysis tools and techniques like user stories, user portraits, user demand matrices, etc., is one way to achieve this. Through these tools and methods, designers can specifically describe and analyse users' needs and usage situations so as to better understand their needs.

The importance of user needs analysis must be addressed. It can help designers identify the primary needs and critical functions of users, guiding subsequent design and development. By deeply understanding the user's needs, designers can design more attractive and practical VR systems to improve the system's usability and user satisfaction.

In conclusion, user demand analysis plays a vital role in VR interaction design. Designers should fully value and adopt appropriate methods and tools to obtain and understand the needs of users to ensure the creation of virtual reality systems that meet their expectations.

User Participation In The Design Process

User participation in the design process is a meaningful way to ensure that VR interaction design meets user needs and expectations. This process can be divided into the user demand collection stage, the user participation design stage, the prototype iteration stage, and the user evaluation stage.

In the user needs collection stage, the design team communicates in depth with the user to understand their needs and usage scenarios. Through communication and understanding with users, the design team can better grasp the expectations and needs of users so as to better meet their requirements in the subsequent design process.

In the design stage, the user is invited to participate in the design process through interviews and questionnaires. In this way, the design team can collect user feedback and suggestions to understand the user's needs and expectations better. These feedback and suggestions can provide a valuable reference for the design team to help them make designs more in line with user expectations during the design process.

The prototype iteration phase is a phase in which the design team makes design improvements and corrections based on user feedback. The design team will adjust and improve the design according to user feedback to improve user satisfaction and acceptance. At the same time, the design team also invites users to test and evaluate the strategy to ensure quality and usability.

The user evaluation phase is the phase where the design team invites the user to make the final evaluation and provide feedback. Through this stage, the design team can understand the user's satisfaction with the design and make suggestions for improvement, thus further improving the design. User evaluation and feedback are invaluable to the design team because they help them find and solve problems in the design and enhance the quality of the design and user experience.

The benefits of user engagement in the design process include a better understanding of user needs, improving user satisfaction and acceptance, and identifying and solving problems in the design. Through the interaction and participation of users, the design team can better grasp the needs and expectations of users so as to design products more in line with their expectations. At the same time, user participation in the design process

can also improve users' satisfaction and acceptance of the design and increase their sense of identity and willingness to use the product.

In addition, user participation in the design process can also help the design team find and solve problems in design and improve the quality and user experience.

In virtual reality interaction design, user participation in the design process is essential. The complexity and uniqueness of virtual reality technology make it even more necessary for users to participate in the design process. Through user participation in the design process, the design team can better understand users' needs and expectations for virtual reality technology so as to design interactive ways and experiences that are more in line with those expectations. User participation in the design process can also improve the availability and acceptability of VR technology and increase user acceptance and willingness to use it.

Therefore, the design team should actively invite users to participate in the design process and pay attention to user feedback and suggestions. Through interaction and participation with the users, the design team can better understand the user's needs and expectations and improve the quality of the design and user satisfaction. At the same time, user participation in the design process can also promote users' acceptance and identity of the design and increase the market competitiveness and user loyalty of the products.

User feedback and evaluation

User feedback and evaluation are crucial links in VR interaction design. User feedback is the process of obtaining information by collecting subjective opinions and observations. To manage user feedback, methods such as interviews, questionnaires, or focus group discussions can be used. In these ways, designers can understand the feelings, needs, and expectations of the VR experience. This subjective feedback is invaluable to designers and can help them better understand user needs and experiences.

On the other hand, user evaluation is used to evaluate the quality and effect of the VR experience through objective metrics and performance tests. For user evaluation, user behaviour recording, eye movement tracking, and physiological signal acquisition can be used. These objective metrics can provide data on the users' behaviour, attention allocation, and physiological responses in a VR environment. By analysing this data, designers can assess the effect and quality of the VR experience, finding potential problems or room for improvement.

User feedback and evaluation can be conducted at different stages of the design process, including the proof-of-concept, prototype design, and product testing phases. During the proof-of-concept phase, designers can validate and adapt the design concepts by collecting user feedback. During the prototype design stage, the designer can test and optimise the prototype of the VR interaction through user evaluation. During the product testing phase, designers can verify the usability and user experience of the product through user feedback and evaluation.

Through user feedback and evaluation, designers can continuously optimise the interaction design to provide a virtual reality experience that meets users' expectations. This user-centered design approach can help designers better understand user needs and expectations and integrate them into virtual reality interaction design. Ultimately, this will improve the quality of the VR experience and enhance user satisfaction and a sense of engagement.

Design Case Study Of The User Center

The key to the virtual reality user experience lies in placing the user at the centre of the design, ensuring that they can easily interact with the virtual environment and have a satisfactory experience. The user-centred design approach emphasises the importance

of user engagement in the design process, designing accordingly through an in-depth understanding of user needs, expectations, and behaviours to achieve this goal.

Designers can collect information by interviewing users, observing their behaviour, and managing user feedback to understand their needs better. This method of in-depth understanding of users helps designers better grasp the psychological and behavioural characteristics of users so as to provide them with a more personalised and tailored experience.

User involvement in the design process is also crucial. Designers can work with their users to jointly explore and create new ways of interacting and experiencing things. Through interaction and cooperation with the users, the designers can better understand the user needs and design together with the users, thus providing a better virtual reality user experience.

A successful example of a user-centric design approach is the interactive approach used in virtual reality games. By working with gamers, the designers developed an interaction based on gesture recognition and somatosensory control, making the game more immersive and interactive. This design method can not only improve user satisfaction but also enhance users' acceptance and use of virtual reality technology and promote the further development of virtual reality.

In conclusion, the user-centred design approach is essential in the virtual reality field. By placing users at the centre of the design, profoundly understanding user needs, and cooperating with users for layout, it can provide a better virtual reality user experience, enhance users' acceptance and use of virtual reality technology, and promote the development of virtual reality.

Design Strategies for Enhancing Virtual Reality User Experience

Invisibility and Ease of Use

Intuitiveness and ease of use are some of the critical design strategies in VR technology to enhance the user experience. To achieve this goal, users can interact with the virtual world through body movements and gestures. The primary purpose of the design is to enable users to intuitively understand and operate the virtual environment, lower the learning threshold, and increase user engagement and satisfaction.

To improve intuition and ease of use, the layout and organisation of the interface should fit the user's cognitive habits and expectations. The location, shape, and colour of the interactive elements should match the user's experience in the real world. In addition, interactions should be simple, avoiding complex gestures or operational procedures. Designers should reduce the cognitive load on users by simplifying the operation mode and providing clear feedback.

In addition, the appearance, materials, animation, and other virtual objects should be similar to those in the real world. The behaviour and response of the thing should meet the user's expectations, such as collision effects and gravity sensing. Feedback and guidance from the interactive interface are also necessary means to improve intuition and ease of use. Provide information through sound, vibration, light, and other operation results and status information to the user and guide the user to operate correctly.

In conclusion, the design strategy of intuition and ease of use can make the VR user experience more natural, smooth, and enjoyable. Through reasonable interface layout, simplified operation mode, realistic objects and scenes, and timely feedback and guidance, the cognitive load of users can be reduced, and their engagement and satisfaction can be improved.

Body perception and natural interaction

As an essential design strategy for the augmented VR user experience, body perception and natural interaction have become the focus of current research. The process of capturing a user's body movements and postures, such as by using sensors worn on the wrist to track hand movements, results in body perception. This technology can enable users to move around more freely in the virtual reality environment so that their bodies can be accurately and instantly reflected in the virtual world.

Natural interaction refers to simulating real-world interactions, such as speech recognition and haptic feedback techniques. Through voice recognition technology, users can directly communicate by voice with the virtual environment so as to operate and control it more naturally. On the other hand, tactile feedback technology enables users to feel the texture and shape of virtual objects by simulating their touch in the real world. The application of these technologies makes users' interactions in virtual reality more natural and intuitive.

Design strategies for body perception and natural interaction can enhance the user's sense of engagement and immersion. Through body perception technology, users can be more directly involved in the virtual reality scene and feel the impact of their presence and actions on the virtual environment. Natural interaction technology enables users to interact with the virtual environment more intuitively and naturally, thus enhancing their immersion.

In the design, designers need to consider the user's physical limitations and individual differences and conduct user testing and feedback to optimise the design. There may be differences in the physical abilities and habits of different users, so designers need to consider these factors to ensure that the invention can adapt to the needs of other users. In addition, through user testing and feedback, designers can understand the user's experience and needs for body perception and natural interaction and thus make improvements accordingly.

In conclusion, the design strategies for body perception and natural interaction can provide a better VR user experience. By capturing the user's body movements and postures, as well as simulating the real-world interaction mode, users can more intuitively and naturally participate in the virtual environment, enhancing their sense of participation and immersion. Designers need to consider the user's physical limitations and individual differences and conduct user testing and feedback to optimise the design to provide a better user experience.

Emotional and Immersive Experiences

In the application of virtual reality technology, the importance of emotional and immersive experiences cannot be ignored. By using intuitive and vivid virtual environments, users' emotional responses can be stimulated. In this way, users can feel more deeply about the emotion and atmosphere presented in the virtual world. For example, in a virtual natural landscape, users can feel the beauty and tranquillity of nature, thus triggering their emotional resonance.

In addition, natural and immersive interaction can also enhance user immersion. By using everyday real-world interactions, such as gesture control and voice commands, users can interact more naturally with the virtual environment. This interaction not only increases users' sense of engagement but also makes it easier for them to engage in the virtual world.

When designing virtual reality applications, rich emotional characters and story plots are also important factors that trigger users' emotional resonance and emotional input. By creating characters and plots with rich emotional expression skills, it is easier for users to resonate with the characters in the virtual world and get into the character's storyline. This emotional resonance and investment can enhance the users' immersive experience and make them enjoy the moving experience brought by virtual reality.

In addition, sociality and collaboration are also important factors to enhance users' emotional and immersive experiences. By introducing social functions and collaboration mechanisms into virtual reality applications, users can interact and cooperate with other users, thus increasing their dynamic input. For example, in a virtual reality game, users can team up with other players to do tasks, working with each other to achieve a common goal. This social and cooperativity can enhance the users' emotional experience and make them more immersed in the virtual world.

Finally, the application of design strategies can also improve users' sense of participation and satisfaction and provide a better user experience. By rationally designing the interface and interaction mode of virtual reality applications, it is easier for users to use them and get a better user experience. In addition, user satisfaction and engagement in virtual reality applications can also be increased by collecting user feedback and improving it over time.

In conclusion, emotional and immersive experiences play an important role in virtual reality. By using intuitive and vivid virtual environments, natural and immersive interactions, emotional characters and stories, social and collaborative, and the application of design strategies, users can enhance their engagement and satisfaction and provide a better user experience.

Sociability and Collaborative

Sociality and collaboration are crucial design strategies in the virtual reality user experience. Enhancing social and collaboration in virtual reality can provide a more accurate and rich user experience and promote interaction and cooperation among users.

Virtual reality technology can be social in a variety of ways. First, by providing realistic character simulation and expression animation, virtual reality can make users feel honest communication with virtual characters. This character simulation technology can mimic human facial expressions and body language, enabling users to understand better and participate in virtual scenes.

In addition, virtual reality can also be social through real-time voice and video communication functions. Users can make voice and video calls through virtual reality devices to communicate with other users in real-time. This type of communication can enhance communication and interaction between users, enabling them to collaborate better and share the virtual experience.

In addition to sociality, VR can also enhance collaboration by providing shared virtual environments. Multiple users can work together in the same virtual space to complete tasks or solve problems together. This function of transmitting a virtual environment promotes cooperation and teamwork among users and improves work efficiency and the quality of results.

However, achieving effective sociability and collaboration still faces some challenges. First, virtual reality technology needs further improved body perception and interaction technologies to provide a more realistic and natural user experience. For example, improved hand and finger tracking can allow users to better communicate and operate gestures in a virtual environment.

Second, network communication and synchronisation technologies also need to be optimised to ensure that interaction and collaboration between multiple users are real-time and delay-free. High-quality network connections and low-latency data transmission are vital to achieving effective sociability and cooperativity.

Future research and development should address these challenges and provide a richer and more satisfying VR experience. By improving body perception and interaction technology and optimising network communication and synchronisation technology, the sociability and

cooperativity of virtual reality can be further enhanced so that users can better participate in and enjoy the virtual reality experience.

Evaluation Method of Virtual Reality User Experience

Quantitative Assessment Method

A quantitative evaluation method is a way to evaluate the VR user experience by using quantitative data. In this approach, researchers use various techniques and tools to collect and analyse the data to obtain an objective assessment of the user experience.

Behavioural observation is a commonly used quantitative evaluation method that evaluates the user experience by observing their behaviour in a virtual reality environment. Researchers can record the user's actions, reaction time, error rate, and other behavioural indicators and assess the quality of the user experience against them.

A questionnaire survey is another commonly used quantitative evaluation method, which obtains data through users' subjective evaluation. Researchers can design questionnaires, including rating scales and satisfaction scales, to let users evaluate the VR experience. By analysing the questionnaire data, researchers can draw users' assessments of different aspects to assess the merits of the user experience.

Physiological indicator measurement is a method to assess the user experience by monitoring the user's physiological response. Researchers can use physiological signal acquisition devices such as heart rate monitors and electroskin monitors to record physiological changes in a virtual reality environment. By analysing the differences in these physiological metrics, researchers can understand the emotional state and quality of experience of users in virtual reality.

Functional testing evaluates the user experience by testing the user's ability to perform specific tasks in a virtual reality environment. Researchers can design a variety of tasks requiring the user to complete in a virtual reality environment and then record the time to complete the job, the accuracy and other indicators. By analysing these metrics, researchers can understand the ability and quality of experience in virtual reality.

Data analysis is a method to evaluate user experience by performing statistics and analysis of data generated by a virtual reality system. Researchers can collect a variety of data generated by virtual reality systems, such as the user's location data interaction data, and then use statistics and data mining techniques to analyse these data. By analysing the data, researchers can obtain information about user behaviour, user preferences, and so on to assess the quality of the user experience.

Quantitative evaluation methods can provide objective data support, help understand the advantages and disadvantages of user experience, and guide improvement and optimisation. However, it should be noted that the quantitative evaluation method can only provide part of the information, and other qualitative evaluation methods and user feedback are also needed to evaluate the user experience comprehensively. For example, qualitative assessment methods can capture their subjective experiences and feelings through in-depth interviews and observation of their behaviour. User feedback is also an essential indicator for assessing user experience. Researchers can use user feedback collection tools, such as focus group discussions and user comments.

In conclusion, the quantitative evaluation method is an effective method to evaluate the user experience of virtual reality, which can obtain objective evaluation results by means of behavioural observation, questionnaire survey, physiological index measurement, functional testing and data analysis. However, in order to fully assess the user experience, other qualitative assessment methods and user feedback should be combined.

Quality Assessment Method

Virtual reality (VR) technology is increasingly widely used in different fields, so it is critical to evaluate its user experience. The qualitative assessment method is a qualitative research method used to assess the user experience of virtual reality. Compared with quantitative assessment methods, qualitative assessment methods pay more attention to the subjective feelings, emotional experiences and behavioural responses of users when using the virtual reality system.

Currently, commonly used qualitative assessment methods include interviews, observation, text analysis, and prototype assessment. Interviews are a way to capture their feedback on their VR experience by communicating with users deeply. Comments can understand users' experiences in a virtual reality environment by observing their emotional experiences and behavioural patterns. Text analysis is an understanding of the virtual reality experience by analysing the user's subjective evaluation and opinions. Prototype evaluation can help improve the design and functionality of virtual reality systems.

The advantage of qualitative assessment methods is the ability to provide rich user feedback and understanding. Through in-depth interviews and observations, researchers can gain in-depth insight into the VR experience. At the same time, text analysis and prototype evaluation can help researchers understand users' subjective assessment and the needs of the system.

However, qualitative assessment methods also face several challenges. First, the subjectivity of the data analysis may affect the reliability of the assessment results. Therefore, when conducting data analysis, researchers need to adopt reliable analysis methods to ensure the objectivity of the results. Second, the representativeness of the sample selection is also a challenge. Since the VR experience is personal, different users may have different experiences. Therefore, researchers need to carefully select the sample to ensure the representativeness of the assessment results. Finally, the consistency of the results is also a problem that needs to be addressed. Different researchers may draw different conclusions from the same data. Therefore, when using qualitative assessment methods, researchers need to ensure data consistency and reliability.

In conclusion, qualitative assessment methods have an essential role in assessing the user experience of VR. When using these methods, researchers should pay attention to a reasonable study design, reliable data collection, and accurate data analysis to ensure the validity and reliability of the evaluation results. This way will help to improve the design and functionality of virtual reality systems and improve the user experience.

Comprehensive Evaluation Method

The rapid development of virtual reality (VR) technology has made user experience the focus of researchers. In VR user experience research, the comprehensive evaluation method is considered an effective means. The complete evaluation method combines quantitative and qualitative evaluation methods to provide a thorough understanding of users' experiences and feelings in the virtual reality environment.

The quantitative assessment method is part of the comprehensive assessment method, which measures the user experience by using tools such as questionnaires and physiological measurement devices. The questionnaire can collect subjective comments and opinions on the virtual reality experience. At the same time, the physiological measurement device can record the user's physiological indicators, such as heart rate and electric skin reaction, to objectively assess the user's emotional and psychological state.

On the other hand, the qualitative evaluation method is also an essential part of the comprehensive evaluation method. Qualitative evaluation methods obtain subjective experience and feedback through observation and interview. Word can help researchers understand users' behaviours and reactions in a virtual reality environment, while interviews

can provide deep insight into users' experiences, including their emotions, opinions and needs.

The advantage of the comprehensive evaluation method lies in the extensive use of both quantitative and qualitative data to assess the user experience from different perspectives. This evaluation method allows researchers to have a more comprehensive understanding of the user experience and feelings so as to guide the improvement and optimisation of VR interaction design. The application of the total evaluation method can improve user satisfaction and market competitiveness of virtual reality products.

However, the integrated assessment method also faces several challenges. First, the complexity of data integration and interpretation is an important issue. The integration of quantitative and qualitative data requires high analytical skills and skills to ensure the accuracy and reliability of the data. Secondly, the influence of individual differences and environmental factors also need to be considered. Different users may have different needs and preferences in the VR experience, and environmental factors such as noise and light may also affect the users' experience. In addition, the comprehensive evaluation method requires the researchers' skills and experience, which requires them to have rich research experience and expertise.

Comprehensive evaluation methods play an essential role in VR user experience research. It can help researchers understand users' experiences and feelings in a virtual reality environment, as well as their needs and expectations for virtual reality products. This provides vital guidance and support for the improvement and innovation of virtual reality technology.

In the future, the comprehensive evaluation method will be further improved and optimised to meet user needs and enhance user experience. Researchers can explore more evaluation methods and tools to more comprehensively and accurately evaluate users' experience. In addition, researchers can use advanced technologies, such as machine learning and artificial intelligence, to analyse and interpret the large amount of data generated by comprehensive evaluation methods. This will help to improve the user satisfaction of VR products and promote the development and application of VR technology. In addition, with the continuous evolution and popularisation of virtual reality technology, comprehensive evaluation methods also need to adapt to new application scenarios and user needs constantly. Researchers can explore more evaluation metrics and ways to meet the needs and preferences of different user groups. For example, for users in specific industries, targeted evaluation studies can be conducted to understand their professional needs and experiences in the virtual reality environment.

In addition, the comprehensive assessment method can also be combined with other research methods to enhance the depth and breadth of user experience research. For example, eye-tracking technology can be combined with integrated assessment methods to study users' attention allocation and information processing in a virtual reality environment. Electroencephalography (EEG) technology can also be combined with comprehensive evaluation methods to study the cognitive processes and emotional experiences of users in a virtual reality environment. These combinations can provide more comprehensive and detailed user experience data and provide more robust support for the improvement and optimisation of virtual reality technology.

In conclusion, comprehensive evaluation methods have an essential role in VR user experience research. It can combine quantitative and qualitative evaluation methods to fully understand the user's experience and feelings in the virtual reality environment. However, comprehensive assessment methods also face several challenges, such as the complexity of data integration and interpretation, the influence of individual differences and environmental factors, and the requirements of researcher skills and experience. In the future, the comprehensive evaluation method will be further improved and optimised to

meet user needs and enhance user experience. Researchers can explore more evaluation means and tools and combine integrated evaluation methods with other research methods to provide more comprehensive, accurate and in-depth user experience data and provide better support for the development and application of virtual reality technology.

The Future Development Direction of The Virtual Reality User Experience

Fusion of Mixed Reality and Augmented Reality

Mixed reality (Mixed Reality, MR) and augmented reality (Augmented Reality, AR) are essential directions of virtual reality technology development.[18]Mixed reality combines virtual elements with the natural world and creates a new experience of virtual and real fusion through the interaction of virtual components and realistic scenes. Augmented reality is about stacking virtual information in the real world, enabling users to sense and manipulate both virtual and real elements simultaneously.

The fusion of mixed reality and augmented reality can be achieved through technologies such as sensors, cameras, displays, and projection. Sensors can sense the user's position and action, the camera can capture the actual scene, and monitors and forecasts can project virtual elements into the user's field of view. Through the combination of these technologies, mixed reality and augmented reality can provide a more immersive VR experience.

The convergence of mixed reality and augmented reality has broad applications in education, healthcare, and entertainment. In the educational field, mixed reality and augmented reality can provide students with more vivid and intuitive learning experiences, such as interacting with the natural world through virtual elements, allowing students to understand abstract concepts better. In the medical field, mixed reality and augmented reality can be used in surgical simulation, case presentation and other aspects to improve the training and practice effect of medical technology. In the entertainment world, mixed reality and augmented reality can give users a richer and more exciting gaming experience, such as by overlaying virtual characters into natural scenes to participate in the game personally.

However, the convergence of mixed reality and augmented reality faces some challenges. First, the technology cost and complexity are significant challenges. Currently, devices and technologies for mixed reality and augmented reality are relatively expensive and complex, limiting their generalisation in large-scale applications. Second, how to design and display virtual elements to seamlessly integrate with the natural world is also a challenge. The fidelity of virtual components and their interaction with natural scenes are crucial to the user experience and require continuous improvement and innovation.

With the development and progress of technology, the application of mixed reality and augmented reality will be more and more extensive. With the continuous upgrading of hardware equipment and technological innovation, the performance of mixed reality and augmented reality will be improved, and the cost will be reduced, thus further promoting the popularisation of their applications. In the future, mixed reality and augmented reality are expected to become an indispensable part of People's Daily life, bringing users to richer, immersive and innovative virtual reality experiences.

Application Of Brain-Computer Interface Technology

The application field of brain-computer interface technology is constantly expanding. In addition to virtual reality, brain-computer interface technology can also be applied in the medical field, education field, entertainment field, and the improvement of human-computer interaction interface.

In the medical field, BCI technology can help restore patients with impaired motor function. For example, the BCI can enable control of the prosthesis by reading brain signals, allowing the ability to of amputees to resume daily life. In addition, brain-computer interface technology can also be used to treat neurological diseases, such as Parkinson's disease

and stroke sequelae. BCI can improve patient symptoms and improve their quality of life by stimulating brain regions.

In education, brain-computer interface technology can provide a more personalised and efficient learning style.[19]By monitoring students' brain activity, teachers can understand students' attention and concentration in real-time and adjust the teaching content and method accordingly to improve students' learning effect. In addition, BCI technology can also help students overcome learning barriers, such as inattention and learning deficits.

In the entertainment space, brain-computer interface technology can provide a more immersive and interactive gaming experience. By reading the player's brain signals, the game can be tailored to the player's intentions and emotions, providing a more personalised and engaging game experience. In addition, brain-computer interface technology can also be used to develop applications for psychological stress management and relaxation training to help users reduce stress and anxiety.

In terms of improving the human-computer interaction interface, the brain-computer interface technology can provide a more natural and intuitive way of interaction. Users can control computers and other smart devices without using a keyboard, mouse or touch screen. This will significantly improve the convenience and efficiency of users, making human-computer interaction more close and seamless.

Although bCI technology has broad application prospects in various fields, it still faces some challenges. First, the accuracy and response speed of BCI technology needs to be further improved to meet the needs of practical applications. Second, users need to train and adapt to make full use of brain-computer interface technology. In addition, the privacy and security of brain-computer interface technology also need to be paid attention to protect the security of users' personal information and brain data.

In short, brain-computer interface technology has broad application prospects and will play an important role in virtual reality, medical care, education, entertainment and human-computer interaction. Through continuous technological innovation and improvement, brain-computer interface technology will bring more prosperous, more intuitive and more personalised experiences to human beings.[20]

Personalized and Customized Experience

Personalised experience and customised experience play an important role in virtual reality technology. Personalised experience refers to customising the functions and interfaces of virtual reality applications according to users' personal preferences and characteristics. A customised experience is to adjust the parameters and Settings of virtual reality applications according to users' characteristics and needs.[21]These two ways of experience can provide a more personalised and close interactive experience between users and the virtual reality environment and further enhance user satisfaction and loyalty.

Designers need to consider the personalised needs of users when designing virtual reality applications in order to provide functions and interfaces that meet users' preferences and characteristics. In order to understand the personalised needs of users, designers can conduct user research and demand analysis and collect user feedback and needs through questionnaires, in-depth interviews and observations. This practice will help designers better understand user preferences and behaviours, allowing them to customise the features and interfaces of VR applications more precisely.

On the other hand, designers can also provide adjustable parameters and setting options, allowing users to adjust the various parameters of the VR application according to their preferences and needs. By delivering flexible setting options, users can customise virtual reality applications according to their preferences and needs so as to get an experience more in line with their expectations.

In addition, designers need to pay close attention to user feedback and needs. Through user surveys, user testing, and user participation in the design process, designers can collect user feedback and requirements for VR applications to optimise further and improve the functionality and interface of the application. Designers can also use machine learning and intelligent algorithms to automatically adjust the functions and Settings of virtual reality applications according to the user's behaviour and preferences, thus providing a more personalised and customised experience.

Personalised and customised experiences can not only improve user satisfaction and loyalty but also bring broader market and business opportunities for VR applications. By meeting the personalised needs of users, VR applications can better meet users' expectations and increase users' engagement and engagement, thus expanding the user base and market share. At the same time, personalised and customised experience also provides opportunities for the commercialisation of virtual reality applications. Designers can provide customised value-added services according to the needs of users to increase the commercial value and profitability of the applications.

CONCLUSION

This paper aims to explore how to enhance the virtual reality user experience through a humanistic interaction design approach. The rapid development of virtual reality technology has brought users an immersive experience but also brought a series of challenges. Among them, intuitiveness and ease of use are some of the critical challenges of virtual reality user experience. Due to the complexity of VR technology, users may face operational difficulties and a steep learning curve. Therefore, in interaction design, attention needs to be paid to how to provide an intuitive and easy-to-use interface to lower the threshold for users to use virtual reality technology.

Another key challenge is the body perception and natural interaction. The goal of virtual reality technology is to simulate real-world perception and interactive experience, so designers need to focus on how to convey body perception through virtual reality devices and interactive interfaces and provide a natural and smooth way of interaction. For example, technologies such as gesture recognition and head tracking can provide a more intuitive interactive experience.

In addition, emotional and immersive experiences are also important aspects of virtual reality user experience. Virtual reality technology can provide a sense of immersive experience, making the user wholly immersed in the virtual environment. However, to achieve an emotional and immersive experience, designers need to consider how to create a realistic virtual environment through a variety of perceptual methods, including visual, auditory and tactile perception, combined with plot and emotional elements to trigger emotional resonance among users.

Finally, the challenges of VR user experience also include social and collaborative. Virtual reality technology can provide users with the opportunity to interact with others, but how to create a natural and social virtual environment is a challenge. Designers need to consider how to provide realistic ways of character expression and communication to facilitate social interaction and collaboration between users.

Humanistic interaction design theory proposes a user-centred approach to VR interaction design to address these challenges. The method includes steps such as user needs analysis, user participation in the design process, user feedback and evaluation. By understanding the user needs and expectations, the design team can provide a better user experience. Design strategies include intuition and ease of use, body perception and natural interactions, emotional and immersive experiences, and sociability and cooperativity. In addition, the evaluation methods of VR user experience include quantitative, qualitative and comprehensive evaluation methods.

Future directions include the integration of mixed reality and augmented reality, the application of brain-computer interface technology, and the provision of personalised and customised experiences. The convergence of mixed reality and augmented reality will further enhance the user experience, allowing users to experience elements of both the virtual and real world. The application of brain-computer interface technology can achieve a more direct and natural interaction mode, providing a more highly immersive experience. Personalised and customised experiences will enable users to customise the VR experience according to their preferences and needs and further enhance the VR user experience. These directions will further drive the development of virtual reality technology, providing more personalised, immersive and realistic backgrounds.

Through the research of this paper, we provide a new perspective and method for the improvement of virtual reality user experience. Through humanistic interaction design theory, we highlight the importance of user needs and participation and propose a user-centred approach to VR interaction design. This approach places users at the heart of the design process to ensure the quality and satisfaction of the user experience.

In the design process, we need to conduct the user needs analysis to understand the users' expectations, preferences and needs. Through user participation in the design process, we can get user feedback and opinions, thus providing a design scheme more in line with user expectations. Furthermore, we highlight the importance of user feedback and evaluation for timely adjustment and improvement of the design.

In designing strategies, we focused on intuition and ease of use, body perception and natural interactions, emotional and immersive experiences, and sociality and cooperativity. By providing an intuitive and easy-to-use interface, users can manipulate VR technology more efficiently. Through the design of body perception and natural interaction, the users can better perceive and interact with the virtual environment. Through the creation of emotional and immersive experiences, users can have more immersive experiences. Through social and collaborative design, users can interact and cooperate with others, enhancing the sense of reality of social interaction.

In terms of evaluation methods, we propose quantitative, qualitative and comprehensive evaluation methods. Quantitative evaluation methods can evaluate the effects of user experience through experimental and statistical data. The qualitative evaluation method can obtain users' subjective experiences and opinions through interviews and observation. Comprehensive assessment methods can use a combination of quantitative and qualitative assessment methods to assess multiple aspects of the user experience comprehensively.

Based on this, future research directions should include the fusion of mixed reality and augmented reality, the application of brain-computer interface technology, and the provision of personalised and customised experiences. The integration of mixed reality and augmented reality will enable users to experience elements of both the virtual and real world, further enhancing the sense of realism and immersion in the user experience. The application of brain-computer interface technology can realise a more direct and natural interaction mode and provide users with a more highly immersive experience. The personalised and customised experience will enable users to customise the virtual reality experience according to their preferences and needs, further enhancing users' sense of participation and satisfaction.

In short, this paper provides a new perspective and method for the improvement of the virtual reality user experience. Through humanistic interaction design theory and user-centred design methods, the design team can better meet the needs and expectations of users and provide a better user experience. We hope that the research results of this paper provide a valuable reference for the design team, promote the development of virtual reality technology, and provide more quality and satisfactory user experience.

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RECENT DEVELOPMENTS IN OPEN BANKING

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ABSTRACT

Open banking, seen widely as a game changer in the financial services sector, has been gaining attention in recent years. Several countries have just started to formally roll out their open banking initiatives, with legislations and regulations newly enacted to govern open banking. There are significant implications for the stakeholders in the existing financial services industry, the hardest hit being the conventional banks, while consumers emerged as the greatest beneficiaries. This chapter presents an overview of the current global state of open banking. It also reviews the existing body of knowledge on open banking and identifies research voids within the current literature.

Keywords: Open Banking, Fintech, Digital Technology

OPEN BANKING: AN INTRODUCTION

The rapid advancement in financial technologies, known as fintech, has revolutionised how society interacts with financial services. The synergies of innovative finance and technological advancements have led to various fintech solutions, such as mobile banking, peer-to-peer payment, digital lending services, and automated investment advisors. Especially in the recent few years, the COVID-19 pandemic has significantly accelerated the adoption and acceptance of digital financial services. According to statistics, the number of fintech startups has doubled over the last five years (Aysan & Nanaeva, 2022), while financial service providers have also been pushing the bar in rolling out increasingly innovative services and products that appeal to customers.

Open banking, which has gained traction over the last few years, has been a major push for innovation in fintech. In simple terms, open banking is a practice that allows the secure sharing of financial information between banks and third parties. It can be defined as a model in which banking data and information are shared between unrelated parties to advance financial services capabilities (Brodsky & Oakes, 2017). The open banking mechanism offers greater flexibility and options for customers regarding financial management, resulting in time savings and financial efficiency while enhancing customers' overall banking experience.

Customers can share their banking and financial data with third-party fintech providers in an open banking system. These are carried out through application programming interfaces (APIs) that allow the exchange of information and data among different systems. As such, third-party providers can access and analyse customers' banking data at various financial institutions to which the customer is affiliated.

CURRENT STATE OF OPEN BANKING

Legislations on open banking across the globe have yet to be consistent, but overall, there has been positive progress towards regulating open banking over the recent two years. The European Union, United Kingdom, Australia, India, and Brazil have formal regulations in force to oversee the open banking industry, while the United States, Canada, and Japan are considering putting in place regulations. Across the globe, open banking legislation has begun to take shape in recent years.

European Union

EU's open banking roadmap started with the Payment Service Directive 2 (PSD2) Bill signed in 2016, which went into member-nations national law in 2018. Under this new directive, all banks are required to review their security profiles and communication interfaces. This was in preparation for opening the banking industry to third-party providers.

United Kingdom

The PSD2 and the UK's Competition and Markets Authority (CMA) guided the UK's open banking landscape. The CMA required the largest banks in the UK to develop a common standard for APIs, which makes it more evident for fintech players to participate in the open banking regime. With the Open Banking API Specifications in place, it serves as a blueprint for all UK banks to refer to, raising the overall standard of open banking in the nation's financial sector.

Australia

Australia's open banking review was commissioned in 2017 as part of the government's budget. The government accepted 51 recommendations from the review, and the Treasury Laws Amendment (Consumer Data Right) Act 2019 was legislated. From July 2019, CommBank, National Australia Bank (NAB), Westpac and Australia and New Zealand Banking Group (ANZ), known as the big four banks, commenced open banking operations by providing access to information on deposits, cards and transactions. This was followed by mortgage and personal data access in November 2020. In 2021, banks outside the big four were required to follow suit in opening up their data.

United States

In October 2022, the Consumer Financial Protection Bureau (CFPB) unveiled plans to issue the CFPB Open Banking Rule, which gives consumers the right to share their data with banks and non-banks through third-party application program interfaces (APIs). This move is seen as a step towards open banking. The CFPB Open Banking Rule covers six categories of consumers' financial information, including transactions, deposits, banking networks, scheduled payments, consumer identity and other miscellaneous information.

Canada

The formal journey to open banking in Canada started in 2018 with the formation of the Advisory Committee on Open Banking (ACOB) to review the potential merits of open banking. In 2020, the ACOB recommended that the open banking initiative proceed. This was followed by a stakeholders' discussion led by the Department of Finance, focusing on the issues of data security and privacy risks in the context of open banking. A final report by AOCB was released in 2021, outlining a two-phase approach for the targeted implementation of open banking in 2023.

IMPACT OF OPEN BANKING

The development of open banking can unlock valuable economic growth. Based on a study by McKinsey (2021), economies that adopt financial data sharing can have their Gross Domestic Product (GDP) increased by up to 5% by 2030, with a significant amount of benefits in favour of customers and financial services providers. Accenture (2021) estimates that a substantial \$416 billion of revenue would be at stake, based on an open banking study conducted on 20 countries representing 75% of the world's GDP. These are striking statistics and estimates that could substantially impact the global economy.

At the entity level, open banking has been proven to disrupt the existing financial services model that we are accustomed to and is an excellent source of challenge to conventional banks (Ramdani et al., 2020). For example, once a third-party fintech provider accesses bank data, we can assume that the screening ability of those data would be significantly improved, given that fintech players have more sophisticated analytical algorithms (He et al., 2023). Open banking poses excellent disturbance to the profitability of conventional banks in the following ways:

Deposits efficiency

With the help of third-party applications, open banking enables the constant analysis of depositors' portfolios of funds in a bank. As such, funds could be automatically moved between depositors' accounts to take advantage of higher interests.

Restructuring of loan payments

Credit card businesses make up a significant revenue stream for conventional banks. Open banking applications help cardholders with weak cash management skills or those finding it difficult to service the monthly payments to identify alternative instalment schemes that are more flexible and cheaper.

Investment options

Allowing depositors to share data with third-party competing fintech companies significantly impacts the investment market as a whole. Innovative fintech apps could target individuals with high disposable income or deposits and offer investment services or products that fit the individual's financial habits. This is a direct competition to conventional banks, who usually cross-sell their investment products to customers.

CURRENT RESEARCH IN OPEN BANKING

There has been growing academic research conducted on open banking since its introduction. This research can be broadly categorised into legislation, technology and structure (Briones de Araluze & Cassinello Plaza, 2022). In terms of legislation, the current literature analyses the legislation and regulations surrounding open banking, which has been increasing over the last two years. The literature analysis of the legislation involves either a single jurisdiction (Fratini Passi, 2022) or a comparison of various jurisdictions (Babin & Smith, 2022; Tsai & Peng, 2022).

Regarding the technological aspect of open banking, the current literature focuses on adopting open banking among consumers based on the Unified Theory of Acceptance and Use of Technology Theory. This is not surprising because adoption is the first barrier for technological innovation to reach critical mass, as suggested by the Innovation Diffusion Theory (Rogers, 2010). Researchers have found that perceived risks and initial trust are both driving factors in open banking adoption, with social influence having a solid effect on open banking adoption (Chan et al., 2022). Researchers have also found that the acceptance of open banking services depends on how well the users' needs are satisfied (performance expectancy) and the required effort needed to learn how to use open banking services (effort expectancy) (Vasić et al., 2023). On top of that, it is also crucial for fintech providers to offer a comprehensive, attractive range of products and services (Iman et al., 2023). Most of the existing literature agrees that trust is the primary factor for open banking adoption among consumers (Kassab & Laplante, 2022).

In terms of structures, current literature has investigated the existing models and structures of open banking. Certain studies have examined the infrastructure developments enabling open banking operatives (Patki & Sople, 2022). Some studies have investigated the broader

ecosystem of open banking, such as security, processes, and governance (Qasaimeh & Jaradeh, 2022). For instance, Daiy et al. (2021) sought to provide a strategy for selecting open banking partners through a multi-perspective approach. They found that environmental factors such as service providers, legal environment, and competition were the significant factors influencing the progress of open banking.

FUTURE STUDIES

One lacking piece in current literature is the topic of financial inclusion. Financial inclusion is defined as households' and firms' use and access to financial services (Demir et al., 2022). As it stands now, financial systems are not always accessible to all spectrums of society (Omar & Inaba, 2020) due partly to reasons such as income inequality and the literacy gap. The present literature on open banking and financial inclusion must be expanded and mainly encompass the global perspective. Therefore, future research should shed light on the impact of open banking on financial inclusion.

Due to the need for a global governance or consultative body, open banking regulations have been developed in isolation. There are delicate variations among open banking legislations across governments, making open banking research nationalised. For instance, in the UK, the maximum duration for consented data sharing is 90 days, but in Brazil, this can be up to 365 days. As such, it would be worthy to carry out international comparative research to analyse the various dimensions of open banking, especially from the perspective of regulatory frameworks, economic structure, and cultural norms.

CONCLUSION

The arrival of open banking has proven to be disruptive across the financial landscape. In a rapidly evolving world of digitalisation and technological advancement, stakeholders need to embrace innovations that would match modern-day banking and financial needs. There are far-reaching benefits for the customers due to open banking adoption. The implementation of open banking should also consider security measures, with constant updates and developments on security and privacy-related matters. As it continues to transform, there is a need for active collaboration between stakeholders to ensure the sustainable growth of open banking.

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DISASTER PREPAREDNESS STRATEGIES AMONG MSME MANUFACTURERS IN THE NORTHERN STATES OF PENINSULAR MALAYSIA FOR INCREASING THE LONG-TERM BUSINESS RESILIENCY OF MSMEs

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ABSTRACT

The disaster preparedness concept is directly associated with coping strategies for disasters used in a firm, especially for manufacturing MSMEs. With a sizeable sample of MSME manufacturers from Kedah and Penang, this study aims to analyse various mitigation measures implemented for developing the MSMEs' disaster preparedness index. The index later measures the significant relationships between disaster preparedness levels and MSMEs' characteristics. Also, this study identifies key deterrent factors which potentially impede their investments in protective measures to face against existing and emerging disasters in their localities. According to the findings, medium-sized manufacturers with legal ownership structures are strategically positioned to become more disaster-resilient entities with higher preparedness levels than small-typed manufacturers. On the policy implication, affected and potentially affected MSME manufacturers are recommended to develop a sustainable working environment with higher preparedness levels that is increasingly resilient to disasters and ensure continued critical operations in lesser periods to maintain the long-term business resiliency of MSMEs.

Keywords: disaster preparedness; MSME manufacturers; resilient; risk management.

INTRODUCTION

Preparedness represents a key concept in disaster management. The preparedness concept has its significance in disaster studies, especially to standardise the practical and theoretical works (Rohith et al., 2018). For example, the practical part of preparedness comes from the capacity to save one's life and to increase control over disaster response activities. Thus, disaster preparedness plays a major role in reducing the casualties in the case of a disaster. For instance, Wachinger et al. (2013) refer to disaster preparedness as individuals' behaviour to employ special measures to avoid or mitigate the risk based on their perceptions of risk and other motivations. Meanwhile, the United Nations International Strategy for Disaster Reduction [UNISDR] (2009) interprets disaster preparedness as the knowledge and capacities developed at varying levels of government, organisation, business, community, household, and individuals to anticipate, respond to, and recover from the potential impacts of hazard events or conditions in an effective manner. Specifically, these efforts span from individual-typed activities such as first aid training to household actions such as stockpiling supplies, business and community efforts such as field exercises, and governmental strategies such as public information dissemination and early warning systems. The concept of preparedness has a direct relationship with coping strategies used in a business organisation, especially for manufacturing micro, small and medium enterprises (MSMEs).

SMEs are integral to a state's economic growth within an economy like Malaysia. Thus far, they have not only created incomes for numerous households but also generated businesses for the people by providing various jobs and supply chain opportunities locally. However, their business operations are likely to be disrupted in the face of any disaster. As a result, damage to properties and premises can affect the continued business operations

of manufacturing MSMEs by causing extensive losses to raw materials in inventories and finished goods in storage warehouses. Among the disasters, a flood event is the main disaster in Malaysia (Auzzir et al., 2018). According to the Federation of Malaysian Manufacturers (FMM)'s Penang Branch Chairman, Datuk Dr Ooi Eng Hock, about 1,000 of 10,000 manufacturing-based SMEs, mostly operated in Seberang Perai and the surrounding areas, appeared to have been severely hit with estimated losses of nearly RM200 million following the 2017's major flood in Penang (Wong, 2017). Apart from that, the 2014 major flood affected losses for over 13,000 SMEs, or 38 per cent of SMEs in Kelantan, as reported by the Ministry of International Trade and Industry (The Malaysian Reserve, 2019). Even worse, most MSMEs faced a state of flux with multiple problems such as impacts from decreased demands, supply chain disruptions, and raw material shortages, among others, amid the prolonged effects of the COVID-19 pandemic nationwide. As a result, many MSMEs are winding up their businesses, some hardly continue to operate, and some will run out of stock soon since MSMEs do not possess sufficient financial and managerial resources compared to their large counterparts.

Because of their financial capabilities and organisational sizes, MSMEs are more vulnerable to natural hazards. Among others, Falkner and Hiebl (2015) suggest that MSMEs are exposed to natural and manufactured disasters due to a few factors mainly due to a lack of financial expertise and the geographical location. In developing nations, MSMEs are likely to face additional constraints such as informal operations keeping them too far from disaster risk management (DRM) strategies like insurance, insufficient diversifications of supplies and customer bases, and a lack of compliance with regulations, thereby heightening disaster risks among their employees (UNISDR, 2013). Thus, investing in DRM resources offers economic benefits that serve as the ultimate goal of any business within a country. In particular, investing in disaster risk prevention and/or disaster preparedness strategies is less costly than paying for losses after a disaster. This aligns with Rohith et al. (2018), who state that preparedness can be measured by observing associated actions to fight against a disaster at an individual level. Hence, DRM investments can contribute to making MSME businesses in respective localities more competitive before, during, and after a disaster. In other words, a business can appear more competitive over the long term given the contributions from preventing and reducing risks, particularly the extensive risk from small but frequent disasters (e.g., floods). Thus far, businesses that have invested the most in risk management may financially outperform their peers (United Nations Economic & Social Commission for Asia and the Pacific [UNESCAP], 2015).

Deitch and Corey (2011) unveiled that several internal, population-related, and macro variables are significant determinants of long-term business performance after the 2005 Hurricane Katrina. Meanwhile, Sydnor et al. (2017) disclosed that the long-term business operations after Hurricane Katrina in 2005 were influenced not only by the impact of the disaster but also by the owner's and business's characteristics. Motivated by such developments, this study primarily focuses on the three objectives. One is to analyse various mitigation measures implemented by the MSME manufacturers for developing the MSMEs' disaster preparedness index. The second objective is to investigate the significant relationships between disaster preparedness levels and owner and business characteristics of MSME manufacturers using the index. The third one is to examine deterrent factors among MSME manufacturers in investing in protective measures for their businesses against emerging disasters in the future.

Baker (2011) and Rohith et al. (2018) agree that a higher number of coping strategies implemented means higher preparedness levels, which will subsequently increase the disaster resiliency of an organisation over longer periods. Thus, preparedness is important in determining the disaster resiliency of business organisations including MSMEs. Overall, the business resilience options of MSMEs are built when they can reduce their vulnerabilities by improving their preparedness levels (Prasad et al., 2015) and developing their coping capacities and coping strategies (Wedawatta, 2013).

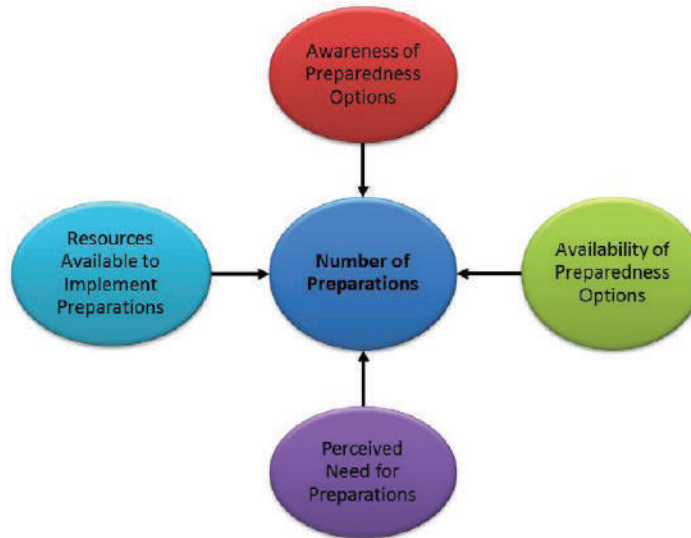
METHODOLOGY

Research Framework

Thus far, varying concepts of disaster preparedness have been employed in different studies, primarily due to the different activities considered preventative actions for various disasters and in different social, cultural, or geographical conditions (Tierney et al., 2001). Hence, this study adopts the framework developed by Baker (2011) for measuring disaster preparedness as per Figure 1.

Figure 1

Conceptual framework in explaining preparedness actions Source: Baker (2011)



Baker (2011) developed a disaster preparedness index by adding up the total number of preparations reported by 1,200 dwelling respondents in the eastern, northwestern, western coastal, and inland counties of Florida, the United States, following the strike of the recent hurricane event. Among others, Baker (2011) claimed that increasing the number of preparations leads to a higher disaster preparedness index. To compare, the respondents were categorised into “low” preparedness and “high” preparedness. In the framework, the number of preparations was utilised as a breakpoint in segregating the two groups as a result of the analysis of the distribution of preparations among the respondents. In computing the disaster preparedness index, all preparations were given equal weight.

Research Design and Survey Response Rate

The survey questionnaire sets were emailed to a sample of 365 MSME manufacturers in Kedah and Penang. This study utilised the existing SME directory within the SME information portal managed by the Secretariat of the National SME Development Council (NSDC). The sample was proportionally drawn from each type of enterprise. The population and sampling frame of this study are presented in Table 1.

Table 1

Population and the stratified proportionate sampling size of manufacturing MSMEs

Enterprise	Number of Companies	% of Population	Sample Size
Medium	164	2.3	8
Small	1,538	21.3	78
Micro	5,533	76.4	279
Total	7,235a	100.0	365b

Source: Department of Statistics, Malaysia (2021)

Note: a refers to the total number of manufacturing MSMEs in Kedah and Penang obtained from SME Bank Group (2021), b a sample of 365 observations is minimally required to be chosen from the total population for reaching the 95% significance level in the produced results (Cavana et al., 2001).

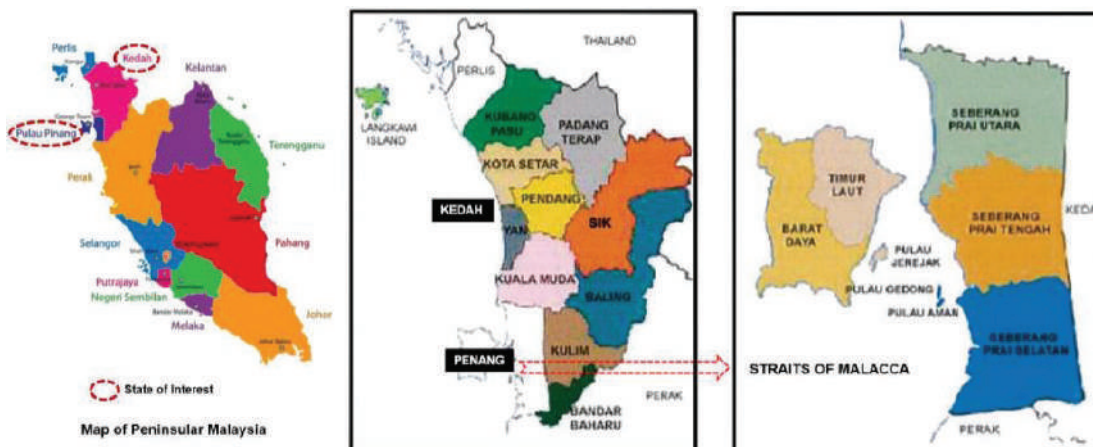
Overall, the survey only obtained a total response rate of about 27.4 per cent, in which the majority of MSME respondents responded to the Malay-based version of the questionnaires. Even though the response rate was considered very low, it is comparable to several Asia Pacific MSME-related studies including those in Malaysia. For instance, business surveys targeted at MSMEs or large firms normally yield a response rate on average, i.e., ranging from 10 per cent to 20 per cent in Malaysia (Hazman, 1998; Kanapathy & Jabnoun, 1998; Othman et al., 2001; Jaafar & Abdul-Aziz, 2005; Hooi, 2006). Also, the 2008 Small and Medium Industries Development Corporation (SMIDEC) survey conducted via email communication had an average response rate of 18% among the Malaysian SME respondents. Given the typically low response rate, this necessitates a test on whether MSME non-respondents would have responded differently. The problem of non-response bias was measured by employing a wave analysis in which the responses were accordingly divided into three waves namely, 1) those who replied before issuing the first reminder, 2) those who replied in the post of the first reminder and before issuing the second reminder and 3) those who replied in the post of second reminder.

Study Area and Data Sampling

The sample of this study covers the MSME operators in the manufacturing sector in the northern states of Peninsular Malaysia, Kedah and Penang as depicted in Figure 2.

Figure 2

Map of Peninsular Malaysia and districts of Kedah and Penang



Note: The maps of Peninsular Malaysia and Kedah and Penang states are meant for illustrative purposes only.

Specifically, these MSMEs are termed entrepreneurs with sales turnovers of not more than RM50 million or full-time employees of not exceeding 200 workers (SME Corp. Malaysia, 2021). According to the Department of Statistics Malaysia (2021), SMEs in the manufacturing sector, which contributed 20.7 per cent of SMEs GDP in 2020, are ranked after SMEs in the seven services sectors are Malaysia's second-largest contributor, with a 62.1 per cent stake in SMEs GDP. This study collected data via online survey forms containing multiple-choice, open-type and closed-type questions. The targeted respondents comprise MSME owners and persons in charge who have control over their respective businesses.

Questionnaire

The questionnaire covers a considerable number of questions in four sections. Section One gathers key information on the business characteristics owned and/or operated by respondents. Section Two investigates various types of natural hazards which have impacts

on their business operations, experiences and damages or losses from the disasters. Section Three assesses the businesses' current and future readiness to face existing and emerging natural hazards. Also, Section Four deals with their personal opinions and willingness to join in future DRM activities.

Data Analysis

Cross Tabulation with Fisher's Exact Test

Cross tabulation, i.e., a contingency table or crosstab, is the analysis of tables involving a comparison based on the frequency distribution of two categorical (i.e., row and column) variables. Fisher's exact test is employed in a small sample analysis but remains valid for all sample sizes.

Fisher's exact test is preferred when dealing with small, expected counts to assess the null hypothesis of independence (Fisher, 1934, as cited in Bolboacă et al., 2011). If the variables are independent (i.e., have no relationship as it's a value of $p > 5\%$ or 0.05), then the test results will be "statistically insignificant" and one fails to reject the null hypothesis (H0). Thus, this means that there is no relationship between the variables.

RESULTS

Table 2 provides the descriptive statistics of the MSME respondents.

Table 2

Information on the MSME businesses

	#	Total %
Registered business		
MSME Operators	100	100.0
Business owner		
Yes	93	93.0
No	7	7.0
Designation		
CEO, ED, MD	60	60.0
SGM, GM, VP, Manager,	32	32.0
Others (e.g. Owners)	8	8.0
Gender		
Male	55	55.0
Female	45	45.0
Involved sector		
Manufacturing	100	100.0
Types of SME by total workers		
Micro	37	37.0
Small	43	43.0
Medium	20	20.0
Types of SME by Annual Sales Revenue		
Micro	37	37.0

(Continued)

Small	43	43.0
Medium	20	20.0
Legal ownership		
Sole trader	58	58.0
Partnership	15	15.0
Private limited company	27	27.0
Main premise ownership		
Own	49	49.0
Rent/lease	43	43.0
Work from home	8	8.0
Businesses affected by natural hazards in the last five years		
Yes	73	73.0
No	27	27.0
Types of natural hazards faced in the last five years		
Pandemic/epidemic	73	73.0
Floods	5	5.0
Haze	5	5.0
Tsunami	1	1.0
Typhoon/storm	0	0
Heat waves/extreme heat	6	6.0
Earthquake	5	5.0
Wildfire	3	3.0
Volcanic eruption	-	-
Landslides	-	-
Drought	-	-
Insect infestation	-	-

Note: # is the number/value of frequency and % is the value of percentage.

Mitigation Measures Implemented by MSME Manufacturers for Disaster Preparations

Table 3 displays the percentage of MSME manufacturers who have taken several measures to mitigate risks in responding to various natural disasters over the 2017 – 2021 period.

Table 3

Mitigation measures implemented by MSMEs for disaster preparations

Preparedness/Mitigation Measures	Percent of Respondents
Ensured compliance with standard operating procedures (SOP) issued by the government	55.0
Planned your supply chain to minimise disruptions	33.0
Obtained property insurance	29.0
Changed business model/ventured into new business lines	25.0
Made premise improvements	23.0
Obtained medical/life insurance for business owners/business partners/employees	19.0

(Continued)

Preparedness/Mitigation Measures	Percent of Respondents
Relocated your stock/equipment	17.0
Obtained business interruption insurance	9.0
Back up your business data in another location	8.0
Installed anti-disaster devices	8.0

Over half of the respondents said that they ensured compliance with standard operating procedures (SOP) issued by the government. They are more likely to have proper safeguards, thus reducing their vulnerability to potential disasters. Subsequently, this followed: one-third stated that they planned their supply chains to minimise business disruptions, and nearly 30 per cent of them expressed that they purchased insurance schemes to insure their business properties. Other preparation levels were reasonably higher, ranging from 25 per cent to 8 per cent descendingly.

Disaster Preparedness Index

The distribution of preparedness index scores among the MSME respondents is shown in Table 4. None of the MSME manufacturers reported making all 10 preparations listed in Table 3. For example, 8.0 per cent of the enterprise types were medium-sized manufacturers, categorised as having high preparedness (i.e., four up to seven preparations), whereas 40 per cent belonged to the low preparedness group (i.e., zero up to three preparations)

Table 4

Disaster preparedness measures among the MSME respondents

Aggregate Score	Percent of Respondents	Preparedness Level	Score Interval	Maximum Percent of Respondents	Highest Group of Enterprise
0	10.0				
1	15.0	Low	0-3	40.0	Small
2	27.0				
3	37.0				
4	6.0				
5	1.0	High	4-7	8.0	Medium
6	3.0				
7	1.0				

Relationships between Disaster Preparedness and MSME Manufacturers' Characteristics

Several variables of disaster preparedness were identified and analysed from past studies, as shown in Table 5. Subsequently, these variables were checked on their associations to determine whether the MSME respondents were subsequently placed in the low or high disaster preparedness category. Given the infeasible use of chi-square tests due to the disclosure that the expected counts of variables were less than five, Fisher's Exact Tests were alternatively used with a five per cent significance level. As such, the results on the statistical significance of disaster preparedness variables are displayed in Table 6.

Table 5

Disaster preparedness-related variables

		Business Characteristics								Owner Characteristic	
		Type of Enterprise		Premise Ownership		Legal Ownership		Business Ownership		Past Disaster Experience	
Previous studies*:		Dietch & Corey (2011); Khan & Sayem (2013); Brown et al. (2015)		Dahlhamer & Tierney (1998); Wasileski, Rodriguez & Diaz (2011); Orhan (2016)		Webb, Tierney & Dahlhamer (2002); Wasileski, Rodriguez & Diaz (2011); Sydnor et al. (2017)		Nigg (1995); Chang & Falit-Baiamonte (2002); Webb, Tierney & Dahlhamer (2002)		Webb, Tierney & Dahlhamer (2002); Asgary, Anjum & Azimi (2012); Marshall et al. (2015)	
Preparedness Level	Score Interval	Max % of Respondents	Highest Group	Max % of Respondents	Highest Group	Max % of Respondents	Highest Group	Max % of Respondents	Highest Group	Max % of Respondents	Highest Group
Low	0 - 3	40.0	Small-sized operators	42.0	Premise owners	56.0	Sole trader	84.0	Business owners	64.0	Yes (Non-first timers)
High	4 - 7	8.0	Medium-sized operators	7.0	Premise owners	5.0	Private Limited	9.0	Business owners	9.0	Yes (Non-first timers)

Note: * indicates that the past authors utilised the following variables of disaster preparedness (and recovery) in their analyses, respectively.

Table 6

Statistical significance of disaster preparedness variables.

Variable	p-values of Fisher's Exact Tests (Exact Significance 2-Sided)	Remarks
Types of Enterprise	0.34	Fail to reject H0
Premise Ownership	0.35	Fail to reject H0
Legal Ownership	0.01*	Reject H0
Business Ownership	0.17	Fail to reject H0
Past Disaster Experience	0.72	Fail to reject H0

Note: * indicates the null hypothesis, H0: two variables are independent of each other to be rejected at the five per cent significance level.

12 Based on Table 6, the four variables, namely types of enterprise, premise ownership, business ownership, and past disaster experience, are revealed to be insignificantly associated with disaster preparedness level. However, only the variable of legal ownership is disclosed to be significantly associated with disaster preparedness level. Thus, it can be concluded that medium-sized manufacturers with strong legal ownership structures possess higher preparedness levels for increasing business resiliency since they become more disaster-resilient entities than small-type manufacturers in both states. For instance, medium-sized manufacturers are likely to have close business relationships with several affiliates, which later provide them with common guidelines for effective disaster management, business recovery, or emergency response plans. Such a proactive approach implemented in place may enhance their resilience when confronted with unforeseen events. Such a finding is aligned with the previous findings of Quarantelli et al. (1979) and Dahlhamer and D'Souza (1997). In contrast, many small businesses with lesser disaster preparedness strategies do not have proper support services and solely depend on the owners' experience for decision-making activities.

Additionally, medium-sized manufacturers with well-established legal ownership structures tend to enable relatively faster decision-making processes during and after a disaster. Given the availability of an owner or management team in place, these manufacturers can swiftly assess the situation, allocate available resources, and implement proper strategies to mitigate the impact of the disaster. Also, these manufacturers are seen as having better access to resources and funding. Having established relationships with financial institutions, insurance providers, suppliers, or investors can facilitate relatively quick access to capital or insurance coverage in the aftermath of a disaster, thereby enabling them to recover and resume business operations in as short a period of time as possible. Additionally, these manufacturers, which consider disaster scenarios as part of their succession planning, can ensure that the responsibilities of leadership and decision-making to be smoothly transferred in case of unexpected events. Given the seamless transition, the manufacturers can maintain their business operations and effectively respond to the challenges inflicted by disasters. Overall, business characteristics, notably legal ownership structure, can increase a manufacturing MSME's long-term resiliency by effectively navigating and recovering from unexpected events or disasters.

Major Obstacles in Implementing Mitigation Measures

There are major obstacles that would impede the implementation of mitigation measures to be taken by MSME manufacturers in protecting their businesses against the emerging impacts of natural disaster events in the future, as exhibited in Figure 3.

Figure 3

Three major obstacles in taking mitigation measures

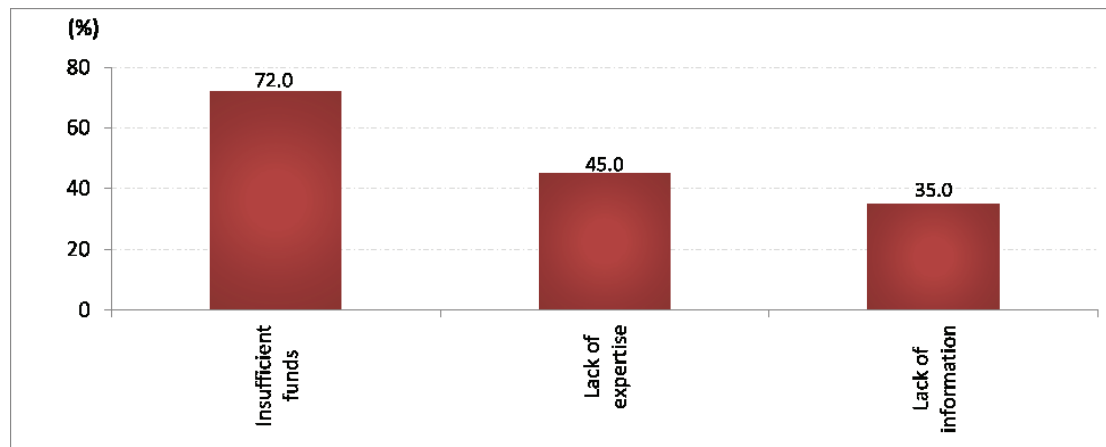


Figure 3 shows that insufficient funds rank as the top barrier (i.e., 72% of the total) that the MSME respondents encountered when taking mitigation measures for their businesses against the effects of natural hazards. Given the limited financial resources in place, MSMEs may find it challenging to allocate available resources for comprehensive disaster preparedness strategies and/or business continuity planning, leaving them more vulnerable to the damages, losses, or disruptions caused by disasters. Equally important, a lack of expertise and information appears to pose some challenges to the MSME respondents with their associated values of 45 and 35 per cent, respectively. These factors can deter MSMEs' ability to prepare for disasters by implementing preferred mitigation measures since they can significantly impede the disaster preparedness strategies of MSME manufacturers.

Overall, insufficient funds hinder MSMEs' ability to invest in infrastructure upgrades, business continuity planning, employee training, emergency supplies, and insurance coverage. Further, while the lack of expertise may restrict MSMEs' ability to accurately assess risks, develop effective emergency plans, efficiently allocate existing resources, access technical knowledge and tools, and provide proper training to their employees, the lack of available information can impede their abilities to adopt best practices, comply with regulations, access support services, receive timely warnings, and establish effective risk

communication channels, especially during disasters. Hence, MSME manufacturers must overcome these limitations and continually improve their disaster preparedness strategies or capabilities to increase the long-term business resiliency of MSMEs against the effect of any natural hazard in their localities.

POLICY RECOMMENDATION AND CONCLUSION

This study investigates a stratified proportionate sampling of 100 MSME manufacturers in Kedah and Penang states. The objectives of this study are to analyse various mitigation measures implemented by the MSME manufacturers for developing the MSMEs' disaster preparedness index, which will be subsequently used to measure the significant relationships between disaster preparedness levels and owner and business characteristics of the MSME manufacturers. Also, the deterrent factors among MSME manufacturers are identified in terms of their investments in protective measures for their businesses against emerging disasters in the future. One of the study findings is that medium-sized manufacturers, i.e., those with pre-existing business characteristics, namely legal ownership, are more likely to increase their business's resiliency to disasters by having higher preparedness levels than small-type manufacturers in the Kedah and Penang states, respectively.

In general, the impacts of natural disaster events are conceivably extensive for MSME manufacturers, stemming from their lack of risk management strategies relative to their larger counterparts. Thus, it is crucial for affected and potentially affected MSME manufacturers to develop a sustainable working environment that is increasingly resilient to natural disasters and continue critical operations in lesser periods to maintain the long-term business resiliency of MSMEs. Apart from that, there is a need for sustainable livelihood recovery strategies focusing on the joint survival or recovery of local businesses and affected communities. Therefore, leveraging MSMEs as key catalysts of the socio-economic recovery locally requires adequate investments and innovative solutions that focus on infrastructure restoration and financial back-up and are also meant for a robust socio-economic policy framework.

Furthermore, the federal and state governments, which play key roles in disaster preparedness and post-disaster recovery phases, ensure that the business environment remains stable, particularly for affected MSMEs, to devise adequate strategies and make proper decisions during post-disaster recovery. Also, governments can foster diverse collaborations and networking channels among MSMEs, industry associations, and relevant stakeholders. By holding forums, conferences, and networking events, sharing best practices, experiences, and resources related to disaster preparedness can be facilitated accordingly. The shared knowledge can help MSMEs develop effective disaster preparedness strategies and increase their collective resilience capabilities. Moreover, governments can enhance public-private partnerships via closed collaborations with private sector entities, international organisations and NGOs (Non-Government Organizations) to implement comprehensive disaster preparedness initiatives. By doing so, the expertise, resources, and joint networks of MSME entities can be leveraged with the availability of related training, access to technology, funding schemes, and other supports for enhancing the long-term business resiliency of MSMEs.

Besides that, governments and other organisations can establish disaster risk financing support programmes that offer local MSMEs access to affordable loans, grants, or financial incentives, particularly aimed at increasing and enhancing the long-term business resiliency of MSMEs. Available funds can be later utilised for investing in disaster preparedness strategies such as insurance coverage, training programmes, infrastructure improvements/upgrades, and business continuity planning. Additionally, various workshops, training sessions and capacity-building programmes that cover selective topics ranging from risk assessment, business continuity, and emergency response planning, to relevant regulatory compliance can be organised by governments to educate or expose MSMEs to disaster preparedness strategies. By strengthening their knowledge and skills, MSMEs can fully prepare for and better respond to existing and emerging disasters within their localities.

By implementing those measures, governments can significantly contribute to increasing the long-term business resilience of MSMEs. Thus, the governments must prioritise providing proper financial support and resources to help local MSMEs enhance their disaster preparedness capabilities since they constitute the backbone of a state's economy and play a primary role in the nation's overall economic recovery and stability.

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COMPULSIVE INTERNET USE, SELF-EFFICACY, AND SELF-ESTEEM AS PREDICTORS OF ACADEMIC PROCRASTINATION AMONG UNDERGRADUATE STUDENTS

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ABSTRACT

Purpose: Academic procrastination was a prevalent pattern among university students. Multiple investigations have illustrated that the inclination for compulsive internet use, self-efficacy, and self-esteem could predict academic procrastination tendencies in undergraduate students. Even with this, the scope of research in the Malaysian educational context has been limited in scrutinizing the influence of compulsive internet use, self-efficacy, and self-esteem on academic procrastination among undergraduates. Hence, this investigation aimed to assess the predictive effect of internet use, self-efficacy, and self-esteem on the academic procrastination tendencies exhibited by undergraduate students in Malaysia. The study was designed as a descriptive cross-sectional study.

Method: Using a purposive sampling technique, a total of 213 participants were enlisted, with online survey links being distributed via platforms like WhatsApp, WeChat, Instagram, Facebook, and Microsoft Teams. The research employed tools such as the Compulsive Internet Use Scale (CIUS), General Self-Efficacy (GSE) assessment, Rosenberg Self-Esteem Scale (RSES), and the Academic Procrastination Scale (APS). The data was analysed through multiple linear regression to evaluate the formulated hypotheses.

Findings: The results derived from the multiple linear regression analysis revealed the predictive effect of compulsive internet use ($\beta = .404$, $p < .001$) and self-esteem ($\beta = .193$, $p < .001$) toward academic procrastination in undergraduate students. Conversely, the data indicated that self-efficacy ($\beta = -.186$, $p = .913$) displayed no predictive effect toward academic procrastination among this group of students.

Significance: These findings offer valuable insights to academic counsellors and institutions of higher learning, encouraging the development of initiatives and strategies to mitigate academic procrastination tendencies.

Keyword: Compulsive internet use, self-efficacy, self-esteem, academic procrastination, undergraduate students

INTRODUCTION

Students often have a busy schedule while attending university, balancing coursework, midterms, presentations, and the need to study for final exams. Academic procrastination is defined by Kim et al. (2017) as a maladaptive behaviour that includes task delays and decision-making postponements in the context of undergraduate students. Technology advancement has accelerated university students' usage of the internet. According to research, a sizable portion of students use internet for non-learning activities like checking emails (98.7%), browsing Facebook (97.9%), streaming or downloading music online (88%), watching YouTube videos (88%), engaging in online chatting (92%), shopping online (67.1%), playing mobile games (67.9%), using Google Maps (70.5%), playing computer games (58.4%), and checking weather forecasts (36.4). Notably, Panda and Pandey (2017) emphasize that university students are drawn to spend much time online due to the appeal

of escaping reality, the ease of internet access, and the possibilities for social engagement. Recent studies (Kandemir, 2014; Brate, 2017; Malyshev & Arkhipenko, 2019) point to a connection between excessive or problematic internet use and a propensity for academic procrastination.

Undoubtedly, self-esteem is essential in university students' lives. Low self-esteem can negatively affect university students' academic performance, campus engagement, and psychological well-being because it is a stress-coping mechanism (Kang et al., 2013). According to additional research, self-esteem levels can predict whether a student will put off doing their homework (Batoool et al., 2017). Kandemir (2014) also highlights the link between academic procrastination and self-efficacy. According to Scholz et al. (2002), self-efficacy deals with a person's upbeat belief in their ability to do tasks. According to Abu Bakar and Umar Khan (2016), one's propensity for academic procrastination is influenced by their attitude toward academic self-efficacy. The research of Cerino (2014) supports this idea, showing that students with higher self-efficacy demonstrate better task preparation. In contrast, those with lower self-efficacy tend to use procrastination as a coping technique.

The predictive effect of self-esteem in academic procrastination among undergraduate students still needs to be understood in the Malaysian setting. Similarly, there needs to be more statistical information on Malaysian undergraduate students' levels of self-efficacy. Self-efficacy can predict academic procrastination behaviour among university students in Malaysia, according to a small number of studies (Uma et al., 2020). However, the majority of attention is placed on factors like university commitment (Gopal et al., 2018), career decision-making commitment (Baruddin, 2021), and career readiness (Mahmud et al., 2019). Furthermore, only some studies examine the connection between self-efficacy and academic procrastination in the Malaysian context. The majority of pertinent research typically comes from outside Malaysia, from places like the Northeastern areas (Cerino, 2014), Nigeria (Ajayi, 2020), and Peru (Hernández et al., 2020), underscoring the limited body of research conducted within Malaysia.

Very little research examines how academic procrastination affects Malaysian undergraduate students' self-esteem, self-efficacy, and compulsive internet use. Even though compulsive internet use has been studied in Malaysian studies, the psychological implications of this behaviour are frequently the main focus (Alam et al., 2014; Kutty & Sreeramareddy, 2014; Othman & Chung, 2017). Similarly, studies on self-esteem among Malaysian undergraduates frequently focus on scientific students' academic achievement and psychological effects (Ahmed et al., 2018; Ikbaal & Salim Musa, 2018; Radeef & Faisal, 2019). Therefore, there needs to be more in-depth research in Malaysia that carefully examines compulsive internet use, self-esteem, and self-efficacy as a predictor of academic procrastination among undergraduate students.

Therefore, this study aims to address this gap by scrutinizing academic procrastination tendencies among Malaysian undergraduates, explicitly focusing on the roles of compulsive internet use, self-esteem, and self-efficacy.

Research Objectives:

R1: To examine whether compulsive internet use predicts academic procrastination among undergraduate students.

R2: To examine whether self-efficacy predicts academic procrastination among undergraduate students.

R3: To examine whether self-esteem predicts academic procrastination among undergraduate students.

Research Hypothesis:

H1: Compulsive internet use significantly predicts academic procrastination among undergraduate students.

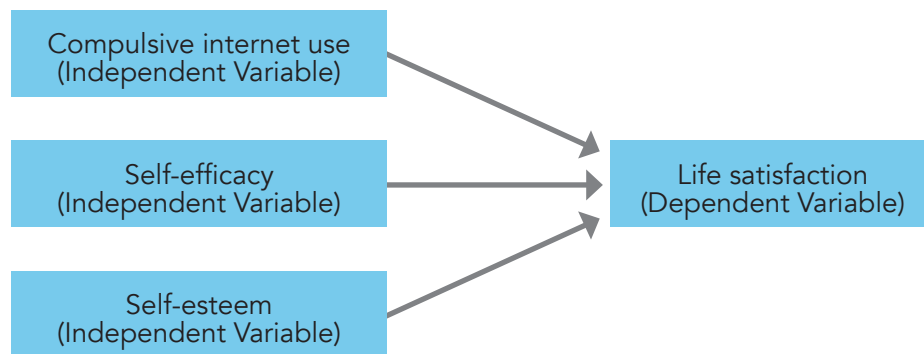
H2: Self-efficacy is a significant predictor of academic procrastination among undergraduate students.

H3: Self-esteem is a significant predictor of academic procrastination among undergraduate students.

Conceptual Framework

Figure 1

Conceptual Framework



LITERATURE REVIEW

Compulsive Internet Use and Academic Procrastination

Ivwhighweta and Igere (2014) conducted research revealing that many college students harnessed the Internet to enhance their academic performance. This involved seeking supplementary educational resources such as e-books and e-journals. The Internet's resources also proved beneficial for final exam preparation and performance. However, alongside these constructive uses, university students have sometimes engaged in less desirable activities facilitated by technology, including online gaming (Tone et al., 2014), forming online acquaintances, and consuming explicit content (Krishnamurthy & Chetlapalli, 2015). While the Internet offers considerable advantages for university students, it also has several disadvantages.

Problematic internet use has been identified as a detrimental factor contributing to academic procrastination, as evidenced by a study conducted by Hayat et al. (2020). In a cross-sectional correlational investigation involving 233 medical students at Shiraz University of Medical Sciences, the researchers found that excessive or compulsive internet use hindered students' completion of assignments, class attendance, and meeting participation. Likewise, other research has yielded similar conclusions, suggesting that academic procrastination can result from excessive or compulsive internet usage (Kandemir, 2014; Ambad et al., 2017; Malyshev & Arkhipenko, 2019). Moreover, a cross-sectional study by Aznar-Diaz et al. (2020) involving college students from Mexico (387) and Spain (371) highlighted that those aged 21 to 35 have a heightened probability of problematic internet use, which in turn contributes to academic procrastination.

According to Malik and Rafiq (2016), escalated internet usage might lead students to consume excessively to evade challenging or unpleasant tasks. This compulsion could lead to a postponement of essential responsibilities. Hence, among university students, an inclination towards compulsive internet use emerges as a potential predictor of academic procrastination.

Self-efficacy and Academic Procrastination

Student procrastination is a prevalent concern (Liu et al., 2020). As Farmer and Dupre (2022) described, self-efficacy pertains to an individual's capability to accomplish tasks or objectives. Furthermore, Bandura's social theory is fundamentally rooted in self-efficacy, a framework for comprehending cognitive and motivational processes underlying human behaviour. This theory aims to elucidate the reasons and mechanisms driving human actions. Self-efficacy plays a pivotal role in a student's academic triumph. As Cerino (2014) highlighted, students with heightened self-efficacy exhibit adept planning skills in academic activities like writing and reading.

Conversely, those with diminished self-efficacy approach learning more casually and carefreely. Consequently, enhancing students' self-efficacy significantly influences their propensity for academic task postponement. This observation aligns with Mutlu's findings (2018), which propose that higher academic self-efficacy and motivation correspond to reduced academic procrastination.

In contrast, Liu et al. (2020) noted in another study that academic self-efficacy is a subset of self-efficacy. The study's results indicated a lousy relationship between academic procrastination and academic self-efficacy. Additionally, due to the Internet's high speed and widespread use, students now have access to more resources for learning and using and quicker access to the data and materials they require. Academic efficacy is the conviction that one can complete one's studies, and academic achievement is vitally crucial to students. Because of this, students who use the Internet in harmful ways will demonstrate poor academic performance, hindering their academic efficacy and causing them to procrastinate more in class (Odaci, 2011). In a recent study, academic self-efficacy and procrastination were negatively and significantly correlated. Academic self-efficacy was also mentioned as a motivating factor that aids students in meeting academic expectations and enhancing their learning effectiveness and outcomes (Arias-Chávez et al., 2020).

Self-esteem and Academic Procrastination

Yang et al. (2021) analysed the correlation between self-esteem and academic procrastination in adolescents. Their findings suggest that levels of academic procrastination among teenagers are influenced by their levels of self-esteem. In essence, self-esteem is an integral factor that contributes to academic procrastination. A preponderance of studies underscores that self-esteem can predict academic procrastination.

Batool et al. (2017) research reveals that self-efficacy mediates the relationship between self-esteem and academic procrastination. The experimental outcomes indicate a positive association between self-efficacy and self-esteem. Low self-esteem leads to reduced self-efficacy, which prompts individuals to postpone or evade responsibilities to preserve their self-esteem. Interestingly, the final study indicates that self-esteem can impact an individual's perceptions of academic self-efficacy, indirectly influencing the likelihood of procrastination.

Another study, however, contends that procrastination is directly influenced by self-esteem. A decline in self-esteem may cause procrastinating behaviour to grow. This leads to the conclusion that an increase in procrastination behaviour might result from a drop in self-esteem brought on by various circumstances, with each condition changing only in how it affects this behaviour. Another study reveals that individuals with low self-esteem may intentionally claim that procrastination is the cause of their poor results (Balkis & Duru, 2017).

METHODOLOGY

Research Design

For this study, a quantitative, cross-sectional research design was selected for data collection and analysis. This design investigated the predictive relationship of Internet addiction, self-efficacy, self-esteem, and academic procrastination within a university student population. The choice of a cross-sectional approach was based on the nature of the study, as it does not involve tracking participants' progress over an extended period. Cross-sectional designs are known for their cost-effectiveness, simplicity in implementation, rapid results, and ability to furnish preliminary evidence for subsequent investigations (Wang & Cheng, 2020).

The quantitative research design adopted here primarily involves the analysis of data collected at a single point in time. A cross-sectional research design entails gathering data over a concise timeframe, enabling a more structured and generalised examination of the data under analysis. This approach establishes a comprehensive database for forthcoming related studies and facilitates drawing inferences from the data itself (Tenny et al., 2022).

Sampling Techniques and Research Participants

In this study, purposive sampling, also called judgmental sampling, within the realm of non-probability sampling, will be employed for data collection. Purposive sampling offers distinct advantages, as it proves cost-effective and enables selection participants who are most likely to provide valuable insights and data. This approach ensures a close alignment between the sample and the study's objectives, thus enhancing the overall rigour and reliability of the research findings (Campbell, 2020). Given that the study aims to explore compulsive internet addiction, self-efficacy, and self-esteem as predictors of academic procrastination among undergraduate students, using purposive sampling aligns well with the characteristics of the Malaysian university student population under investigation. This approach optimises available data to address research questions (Tongco, 2007).

The decision to employ an online questionnaire as the data collection method was guided by its convenience for Malaysian university students. This format permits participants to complete the survey from anywhere, facilitating quicker responses and a more efficient data collection process. This approach also allows the researcher to swiftly gather responses from a diverse range of Malaysian university students within a concise timeframe, expediting subsequent data analysis.

Instrument

Compulsive Internet Use Scale (CIUS), was developed by Meerkerk et al. (2009). CIUS aims to measure internet addiction and/ or compulsive, pathological, problematic internet use. It consists of 14 items, ranging from 0 to 4 (0= never; 1= seldom, 2= sometimes, 3= often, 4= very often). The total score range from this instrument is 0 to 56. According to Meerkerk et al. (2010), scores below 28 indicate low levels of internet addiction and/ or compulsive, pathological, problematic internet use, while scores above 28 indicate high levels of internet addiction and/ or compulsive, pathological, problematic internet use. This instrument has a strong internal reliability score of $\alpha = .94$ when administered to 159 university students from Charles Sturt University (McIntyre et al., 2015).

General Self-Efficacy (GSE), developed by Schwarzer and Jerusalem (1995). The objective of this measurement scale is to measure one's self-efficacy. It consists of 10 items and is evaluated by a four Likert scale (1= not at all true; 2= hardly true; 3= moderately true; 4= exactly true). The total score range of GSE is 10 to 40. The higher the total score, the higher the self-efficacy. GSE has a strong internal reliability score of $\alpha=0.87$ when administered to 2537 undergraduate students from the University of Novi Sad, Serbia (Lazić et al., 2018). In this study, GSE has a strong internal reliability score with $\alpha = .79$.

Rosenberg Self-Esteem Scale (RSES), developed by Rosenberg (1965). The objective of this measurement scale is to measure one's self-esteem. It consists of 10 items, each item evaluated by a four Likert scale (1= strongly agree; 2= agree; 3= disagree; 4= strongly disagree). The item-2, item-5, item-6, item-8, and item-9 were reversed items. The total score is calculated by summing up all the question points. The higher the total score, the higher the self-esteem. This instrument has a strong internal reliability score of $\alpha=0.91$ when administered to 600 undergraduate students from the universities of Khyber Pakhtunkhwa (Shagufta & Nazir, 2021). In this study, RSES has a strong internal reliability score with $\alpha = .743$.

Academic Procrastination Scale (APS), developed by McCloskey (2011). The objective of this measurement scale is to measure one's academic procrastination level. It consists of 25 items, and each item is evaluated by a five-point Likert scale (1= disagree; 5= agree). The item-1, item-8, item-12, item-14, and item-25 were reversed items. The total score is calculated by summing up all the question points. The higher the total score, the higher the academic procrastination. This instrument has a strong internal reliability score of $\alpha=0.95$ when administered to 732 college students from Indonesia (Margaretha et al., 2022). In this study, APS has a strong internal reliability score with $\alpha = .889$.

Research Procedure and Ethical Consideration

Before commencing this study, we diligently secured approval from the UTAR Scientific and Ethical Review Committee. Subsequently, we employed Qualtrics to develop our survey instrument, which was disseminated to our targeted participants through various social media platforms, including Facebook, Instagram, WhatsApp, Microsoft Team, and WeChat. The questionnaire itself encompasses several sections, beginning with an informed consent form, followed by sections for gathering demographic information, and concluding with four measurement scale inquiries.

The informed consent form explicitly articulated that all information collected would be safeguarded in compliance with the Personal Data Protection Act 2010 ("PDPA") to assure the participants of their privacy and data protection. Before the survey, participants were allowed to read and comprehend the study's purpose and nature carefully. They were then invited to volunteer as participants by consenting through the "I agree to participate" option. Upon providing their consent, participants proceeded to engage with the questionnaire components.

Data Analysis

The current study employed SPSS Version 27 to perform data analysis. The demographic information, which included variables such as age, gender, ethnicity, and university, was analysed through descriptive statistics. Also, the current study employed Multiple Linear Regression techniques to analyse inferential statistics, such as the predictive effect of compulsive internet use, self-efficacy, and self-esteem regarding academic procrastination among undergraduate students.

RESULTS AND DISCUSSION

Descriptive Statistic Variables

Table 1

Demographic Information of Participants (N=213)

		Frequency (n)	Percentage (%)	Mean	SD
Age	18 below	2	0.9	2.03	0.215
	18-25	203	95.3		
	25 above	8	3.8		
Gender	Male	92	43.2		
	Female	121	56.8		
Ethnicity	Malay	7	3.3		
	Chinese	200	93.9		
	Indian	6	2.8		
Universities	HELP	2	0.9		
	Heriot-Watt	2	0.9		
	INTI	1	0.5		
	MMU	1	0.5		
	Sichuan	1	0.5		
	Sunway	1	0.5		
	TARUMT	3	1.4		
	The One Academy	1	0.5		
	UKM	1	0.5		
	UM	1	0.5		
	UPM	1	0.5		
	USM	1	0.5		
	UTAR	192	90.1		
UTM	1	0.5			
UUM	4	1.9			

The data above reported 213 participants with a mean age of 2.03; SD= 0.215 involved in this study. There were 92 males and 121 females. Most of the participants were Chinese (200), followed by Malay (7) and Indian (6). Further, most of the undergraduate students come from UTAR (192), followed by UUM (4), TARUMT (3), HELP (2), Heriot-Watt University Malaysia (2), INTI (1), MMU (1), Sichuan University (1), Sunway (1), The One Academy (1), UKM (1), UM (1), UPM (1), USM (1), and UTM (1).

Inferential Analysis

Multiple Linear Regression Analysis

Multiple Linear Regression was used to examine if compulsive internet use, self-esteem, and self-efficacy significantly predicted academic procrastination among undergraduate students in Malaysia. The result showed that the model was statistically significant ($F=25.357$, $P<.001$) and accounted for 25.6% of the variance (Refer to Table 2 and Table 4). It was found that compulsive internet use ($\beta = .404$, $p <.001$) and self-esteem ($\beta = .227$, $p <.001$) significantly predicted academic procrastination among undergraduate students

in Malaysia. However, self-efficacy ($\beta = .007$, $p = .913$) did not significantly predict academic procrastination among undergraduate students (Refer to Table 3).

Table 2

Model Summary of Multiple Linear Regression

Model Summary of R-Square Value

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std Error of the Estimate	Durbin-Watson
1	.571a	.267	.256	11.62167	1.685

a. Predictors: (Constant), Compulsive Internet Use, Self-Esteem, Self-Efficacy

b. Dependent Variable: Academic Procrastination

Table 3

Multiple Regression Analysis of Compulsive Internet Use, Self-Efficacy and Self-Esteem in Predicting Academic Procrastination

Coefficient ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	21.935	9.585		2.288	.023
Compulsive Internet Use	.658	.101	.404	6.530	<.001
Self-efficacy	.024	.222	.007	.109	.913
Self-esteem	.874	.247	.227	3.534	<.001

a. Dependent Variable: Academic Procrastination

Table 4

ANOVA Statistics between Compulsive Internet Use, Self-Efficacy, Self-Esteem, and Academic procrastination

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10274.282	3	3424.761	25.357	<.001
	Residual	28228.206	209	135.063		
	Total	38502.488	212			

a. Dependent Variable: Academic Procrastination

b. Predictors: (Constant), Compulsive Internet Use, Self-Efficacy, Self-Esteem

H1: Compulsive internet use is a significant predictor of academic procrastination among undergraduate students.

The multiple linear regression model indicated that compulsive internet use significantly positively predicted academic procrastination among undergraduate students. This result is consistent with past studies (Brate, 2017; Özyer & Altinsoy, 2023), which described compulsive internet use as positively predicting academic procrastination among undergraduate students.

The self-escape theory can explain this finding. When undergraduate students cannot cope with the current situation, such as assignment overload, they will engage more on the internet to eliminate negative emotions such as stress or frustration (Pekpazar et al., 2021). Therefore, undergraduate students may spend more time on the internet; they turn to the internet as a coping mechanism. Moreover, compulsive internet use may lead to a decrease in self-control. According to Agbaria and Bdier (2019), compulsive internet use leads to academic procrastination due to undergraduate students' fear of missing out, wanting to stay connected, and delaying academic tasks. Additionally, undergraduate students can obtain various information from the internet, which can be distracting. This "distraction" can delay students' academic assignments (Anierobi et al., 2021).

H2: Self-efficacy is a significant predictor of academic procrastination among undergraduate students.

The multiple linear regression model indicated that self-efficacy did not significantly predict academic procrastination among undergraduate students. This result contradicts previous studies (Mutlu, 2018; Cerino, 2014), which describe self-efficacy as a negative predictor of undergraduate academic procrastination.

While other studies have shown that self-efficacy is negatively related to academic procrastination among undergraduate students, the results of the present study indicated that self-efficacy was not significantly related to academic procrastination. Moores & Chang (2009) mentioned that when individuals have high levels of self-efficacy, it can lead to overconfidence, which can lead to over-optimism about one's ability to complete tasks and unnecessary postponement of task completion. Also, Amran and Zulkifli (2020) mentioned that a high degree of self-efficacy leading to overconfidence and academic procrastination were positively correlated, and the findings indicated that low motivation was the most significant factor affecting academic procrastination among undergraduate students. Moreover, He (2017) stated that laziness, lack of interest, and overconfidence are the leading causes of academic procrastination among undergraduate students. Academic procrastination can be used as a predictor of high self-efficacy but not as a direct predictor. In conclusion, self-efficacy mediates the relationship between overconfidence and academic procrastination, and academic procrastination is positively correlated with high levels of self-efficacy, leading to overconfidence in a unidirectional manner.

H3: Self-esteem is a significant predictor of academic procrastination among undergraduate students.

Multiple linear regression models indicated that self-esteem significantly predicted academic procrastination among college students. This result is consistent with past research findings (Browne, 2016; Hernández et al., 2020). It indicates that self-esteem can act as a predictor of academic procrastination.

This finding can be explained by cognitive appraisal theory. This theory refers to an individual's evaluation and perception of self, and this self-perception can be negative or positive (Shrout & Weigel, 2020). Negative self-perceptions may exacerbate an individual's academic stress, thus leading to procrastination, when undergraduate students have a negative perceptual evaluation of themselves that prevents them from performing poorly, and academic procrastination is used as an excuse to protect self-esteem (Hernández et al., 2020). On the other hand, self-esteem positively correlates with self-efficacy, and students' low self-efficacy weakens the relationship between self-esteem and procrastination. Students with low academic motivation and efficiency can develop a denial of self-worth to conceal weak self-esteem and thus further avoid academic tasks and responsibilities (Ferdian Farhan, 2020).

Implication of Study

Theoretical Implication for Future Research

The theories used in this study are the Cognitive-Behavioral Model of Pathological Internet Use (PIU) model and the Cognitive appraisal theory; these two models suggest that compulsive internet use, self-esteem, and self-efficacy have some influence on undergraduate students' academic procrastination. In particular, compulsive internet use has been studied extensively in other Western countries, but only some studies in Malaysia about this area exist.

In addition, this study also found that compulsive internet addiction and self-efficacy are significant predictors of academic procrastination, while self-esteem is not a significant predictor of academic procrastination. Therefore, this study can provide some basic information and data about compulsive internet addiction and self-esteem as significant predictors of academic procrastination for future research on undergraduate backgrounds in Malaysia, broaden the path of research in this area, and provide some practical suggestions for reducing academic procrastination among undergraduate students in the future.

Practical Implication for Programs and Policies

This study reflects on the predictive relationship between self-esteem, self-efficacy, compulsive internet use, and academic procrastination among undergraduate students. The practical implications are to increase public awareness, enhance academic self-management, and better cope with academic procrastination.

University students can reduce the academic stress caused by academic procrastination by developing a self-regulatory plan. According to the results of this study, compulsive internet use is a significant predictor of academic procrastination. Therefore, university students can reduce academic procrastination by managing their time on their mobile phones, raising awareness of the dangers of compulsive internet use for academic purposes, and changing their behaviour subconsciously. In addition to self-monitoring, this could also be applied to study rooms at university, where students entering the study room must hand in their mobile phones to a safe and return them when they leave the room. The aim is to limit students' behaviour on their mobile phones to reduce academic procrastination and improve their study efficiency.

On the other hand, this study also concluded that self-esteem predicts academic procrastination, which could be used by schools in collaboration with mental health professionals to organize sessions to guide students to redefine their self-concept and guide them on how to cope with academic procrastination, improve their self-esteem and thus reduce academic procrastination.

Limitations and Recommendations

The study had a few limitations. The first limitation is the generalization issue. This study's participants were not recruited equally from the universities within Malaysia. Based on the descriptive table, most participants were UTAR degree students. Therefore, it may not represent the whole population of undergraduate students within Malaysia. Hence, future research may suggest to include samples from diverse backgrounds.

Besides that, the second limitation is that the study employed correlational research and could not determine the causal effect of variables. In the current study, the finding can only identify the predictive relationship of the variables. Thus, future research can employ longitudinal studies to study the causal effect.

CONCLUSION

In conclusion, this study investigated compulsive internet addiction, self-efficacy, and self-esteem as predictors of academic procrastination among undergraduate students. The results indicated that compulsive internet addiction and self-esteem significantly predicted academic procrastination. However, self-efficacy did not significantly predict academic procrastination among undergraduate students in Malaysia. Kutty and Sreeramareddy (2014) and Chang et al. (2019) indicated that with the Internet becoming the primary communication medium, many other Western countries are investigating, while few from Malaysia about compulsive Internet use. This study can provide some data and theoretical basis for subsequent studies, especially when the survey respondents are Malaysian undergraduate students. As the Internet becomes more and more popular, undergraduate students should not only focus on the impact of self-esteem and self-efficacy on their studies and lives but also on the impact of compulsive Internet use on their academic lives. It is hoped that future researchers will gain helpful information from this study and provide practical suggestions to reduce academic delays among future undergraduate students.

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BAGAIMANAKAH STRATEGI PENGAJARAN YANG DAPAT MENINGKATKAN KREATIVITI MURID?

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ABSTRAK

Tujuan kajian ini untuk meneroka strategi pengajaran yang berkesan dalam menggalakkan kreativiti murid. Metodologi yang digunakan dalam kajian ini menggunakan kaedah PRISMA, untuk meneroka persoalan kajian, bagaimana strategi pengajaran digunakan untuk merangsang pemikiran kreatif murid. Antara pangkalan data yang digunakan untuk mencari maklumat (Google Scholar, Web of Science, Springer dan Science Direct), 35 artikel telah disaring dan 7 artikel sahaja yang mengikut kriteria yang diperlukan. Penilaian kritikal terhadap artikel ini telah dijalankan menggunakan jadual ringkas. Analisis tematik digunakan untuk mengenal pasti tema utama. Keputusan kajian menunjukkan tujuh artikel telah dikenal pasti dan strategi pengajaran yang digunakan umumnya adalah reka bentuk untuk menggalakkan murid berfikir secara kreatif. Strategi rekabentuk dapat meningkatkan kemahiran pemikiran kreatif dari aspek penemuan baharu dan penyelesaian masalah dalam menghasilkan sesuatu produk. Pemikiran kreatif tersebut dibina sama ada melalui proses (kolaborasi atau komunikasi) atau penghasilan sesuatu karya (penyelesaian masalah). Keperluan kajian ini adalah mendedahkan tentang konsep pemikiran kreativiti dalam pendidikan telah wujud selama bertahun-tahun, tetapi memerlukan usaha yang bersistematik untuk merangsang pemikiran murid menjadi kreatif.

Kata kunci: STEAM, Pendidikan Seni, Pendidikan Malaysia, artikel ulasan, strategi.

This study aims to explore effective teaching strategies for encouraging student creativity. The PRISMA method was used to investigate how teaching strategies stimulate creative thinking in students. Among the databases searched (Google Scholar, Web of Science, Springer, and Science Direct), 35 articles were screened, and only 7 articles met the required criteria. Critical evaluation of these articles was conducted using a concise table. Thematic analysis was used to identify the main themes. The study's findings indicate that seven articles were identified, and the teaching strategies commonly used are design-based to encourage creative thinking in students. Design-based strategies can enhance creative thinking skills in terms of innovation and problem-solving in producing a product. Creative thinking is fostered either through processes (collaboration or communication) or the creation of a work (problem-solving). The need for this study is to reveal that the concept of creative thinking in education has existed for years but requires systematic efforts to stimulate students' creative thinking.

Keywords: STEAM, Art Education, Malaysian Education, Review Article, Strategies.

PENGENALAN

Masalah Dunia Nyata

(Paolucci,2021) antara cara terbaik untuk mendapatkan pengalaman yang nyata dalam pengajaran memerlukan guru mahir dalam bidang matapelajaran yang diajar. (X.Weng etl., 2022) Guru dapat memberi peluang kepada murid mendapatkan pengalaman menyelesaikan masalah yang diberi dalam kelas sebagai satu simulasi masalah dunia sebenar. Pembelajaran berasaskan dunia nyata banyak didedahkan melalui STEAM iaitu singkatan bagi Sains, Teknologi, Bahasa Inggeris (English), Seni (Art) dan Matematik. Jika (EA Dare,2021) dalam kajiannya menyatakan guru mempunyai pelbagai idea yang berkaitan

dengan disiplin STEM dalam pengajaran STEM bersepadu, dan boleh membantu pendidik guru untuk menyediakan simulasi pengalaman menyelesaikan masalah dalam pengajaran yang lebih berkualiti. Apatah lagi melalui STEAM yang diwujudkan bagi meningkatkan daya saing dalam bidang pembangunan teknologi yang berlandaskan Industrial Revolusi 4.0 (IR 4.0).

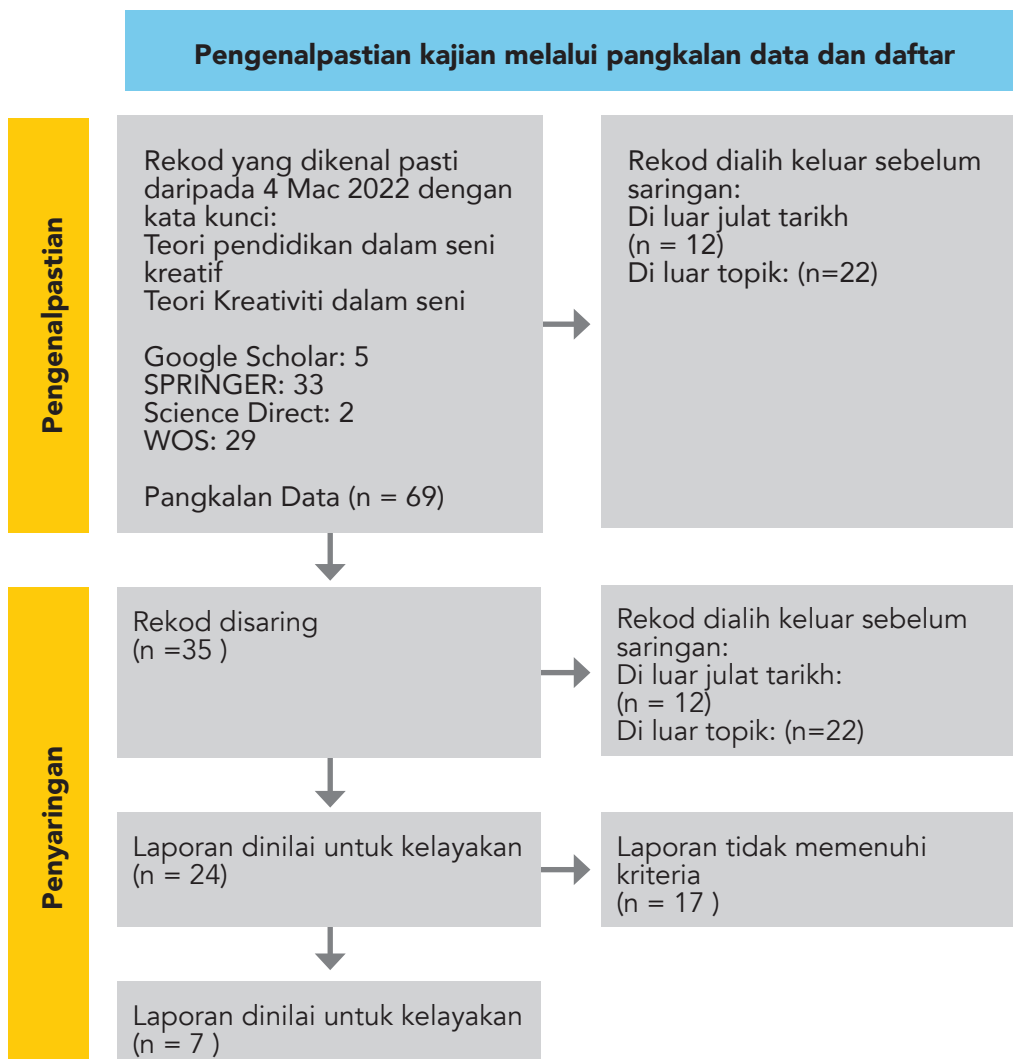
METODOLOGI

Kaedah - Strategi Carian

Model PRISMA digunakan sebagai panduan dalam mencari bahan literatur. Proses semakan sistematik untuk memilih artikel adalah melalui pengenalan, saringan dan termasuk. Dalam peringkat pengenalan beberapa kata kunci dan istilah yang serupa dan 69 artikel telah ditemui pada Mac 2022 namun 34 artikel dikeluarkan kerana tidak relevan dari aspek usia artikel dan aspek lain adalah artikel tersebut luar topik. Peringkat kedua iaitu saringan. Saringan pertama dengan membuat saringan 35 artikel, 11 rekod sedang dikeluarkan kerana tidak dapat akses penuh jurnal. Saringan kedua dijalankan ke atas 24 artikel tetapi 17 artikel dikeluarkan kerana tidak memenuhi kriteria. Hanya 7 artikel sahaja yang dianalisis dalam penulisan ini.

Rajah 1

Carta Alir Model PRISMA 2020



Analisis

Proses membangunkan tema yang sesuai telah dijalankan berdasarkan analisis tematik. Fasa pertama dalam proses pembangunan tema ialah penyusunan data. Dalam fasa ini, penulis menganalisis dengan teliti sekumpulan 7 artikel terpilih untuk mengekstrak kenyataan atau data yang menjawab persoalan kajian. Akhirnya, proses tersebut telah menghasilkan sebanyak tiga tema utama dalam melaksanakan pengajaran membina kreativiti murid.

SOROTAN LITERATUR

(X.Lu, 2022) Kreativiti merupakan ciri utama yang membolehkan murid menyesuaikan diri dengan lancar kepada perubahan sosial dan ekonomi yang pesat dalam dunia dan membuktikan betapa pentingnya pemikiran kreatif untuk menyelesaikan masalah menjadikan kreativiti merupakan kemahiran utama abad kedua puluh. (I.Zwir el., 2022) Kreativiti boleh ditakrifkan secara ringkas sebagai penggunaan imaginasi atau idea asli untuk mencapai matlamat yang dihargai iaitu dengan idea yang unik. (Edward de Bono, 1992) Terdapat semakin ramai orang yang percaya bahawa kemahiran berfikir kreatif boleh dipertingkatkan melalui usaha penambahbaikan dari pendekatan pengajaran yang digunakan. Ini disokong oleh (Thimothy etl., 2021) yang menyatakan semakin banyak negara telah menekankan kreativiti dalam kurikulum rasmi mereka. Menurut Helbert Read, kanak-kanak diajar bukan hanya untuk mengetahui tetapi pada masa yang sama mengajar mereka mencipta. Untuk mengetahui fakta (otak kiri) adalah suatu perkara yang menukarkan fakta kepada bentuk baru yang memerlukan keupayaan membuat metafora (otak kanan) adalah suatu perkara yang lain, merupakan fungsi pemikiran kreatif. bagi mempertingkatkan daya kreativiti seseorang, dan untuk fungsi otak kanan dan kiri digunakan dalam pembelajaran pengalaman aktiviti pendidikan seni amat diperlukan ini disokong oleh kenyataan (NKC Cahyani, 2021) kreativiti murid dapat ditingkatkan dengan ruang dan peluang yang diberi oleh guru dalam kelas.

(Jill Estifiniak, 2021) Apabila pakar reka bentuk instruksional terlibat dalam reka bentuk, proses dan hasil, mereka menggunakan prinsip reka bentuk yang sistematik dengan menyelaraskan pelbagai tugas, dan memanfaatkan sumber dalam persekitaran mereka untuk memudahkan pembelajaran. Penglibatan murid dalam proses penyelesaian masalah yang tidak terancang dan akan menggalakkan pemikiran kreatif murid. (CY Liu etl., 2021) dalam kajiannya menyatakan pelaksanaan STEAM sering meninggalkan unsur seni dalam pengajaran ini disokong oleh seni sering dipinggirkan dan diabaikan dalam pendidikan STEAM kerana pengalaman emosi pelajar dirangsang oleh unsur seni, maka pengajar boleh mengembangkan lagi minat murid semasa melaksanakan STEM dalam pengajaran selari dengan kenyataan June King McFee mentaktifkan kreativiti sebagai keupayaan seseorang mencipta sesuatu yang baru atau mampu mengolah idea baru atau lain yang lebih bermakna seni tidak terhad kepada hasil karya seni sahaja tetapi juga melibatkan pengalaman estetika. Viktor Lowengfeld berpendapat kreativiti ialah suatu naluri (instinct) semula jadi sejak lahir yang dimiliki oleh setiap orang. Naluri itu adalah faktor pertama digunakan bagi menyelesaikan atau membuat pernyataan tentang masalah kehidupan. Keinginan pula menjadi asas yang mendorong seseorang berupaya menyelidik dan meneroka sesuatu. Tanpa naluri dan keinginan, manusia tidak akan bertindak.

DAPATAN DAN PERBINCANGAN

Dapatan berdasarkan artikel diterjemah dalam bentuk jadual.

Jadual 1

Dapatan Artikel

PENULIS DAN TARIKH	Tema 1	Tema 2	Tema 3
1 (Ozkan & Topsakal 2021)	Reka bentuk Pembelajaran	Reka bentuk STEAM	Menjelaskan tentang proses seni dalam STEM
2 (Hettithanthri & Hansen, 2021)	Reka bentuk Pembelajaran	Reka Bentuk Latihan Studio	Pedagogi yang sesuai untuk kreativiti adalah i. Pembelajaran Berasaskan Projek ii. Pembelajaran Berasaskan Masalah
3 (Bressler & Annetta, 2022)	Reka bentuk Pembelajaran	Pemikiran Reka Bentuk dalam gamifikasi	Pendedahan yang diberi oleh guru tentang pendekatan Reka bentuk Pembelajaran dari sudut pengalaman dapat memberi impak dalam pengajaran guru.
4 (Yang et al., 2021)	Reka bentuk Kriteria	Pendidikan Reka Bentuk	Menjelaskan tentang kolaboratif dalam pembelajaran reka bentuk

Hasil analisis tematik yang dijalankan pengkaji mengkategorikan bacaan artikel kepada 3 Tema. Tema 1 adalah jenis Strategi Reka bentuk yang digunakan dalam artikel. Namun kriteria tersebut dibahagikan kepada dua iaitu Rekabentuk Pembelajaran dan Rekabentuk Kriteria. (Taneri & Dogan, 2021) Rekabentuk Kriteria memberi penekanan kepada penyelesaian masalah, pembinaan karya, sangkaan terhadap idea yang dibina, masalah semasa projek dihasilkan, Rekabentuk Pembelajaran pula memberi penekanan kepada kolaboratif semasa sesuatu projek dihasilkan yang dihasilkan. (Orr & Blythman, 2002) menerangkan dalam kajiannya pendekatan reka bentuk yang berkaitan kolaboratif iaitu peranan ahli kumpulan, kaitan individu dengan bahan yang dihasilkan pandangan lain tentang projek yang akan dihasilkan dan pemahaman tentang proses reka bentuk.

Bagi Artikel 1, dilabelkan sebagai Reka bentuk Pembelajaran kerana Ozakan (2021) menengahkan proses reka bentuk STEM sebagai satu elemen membina kreativiti murid dapat ditingkatkan dari aspek lisan dan figura dan menerapkan seni dalam pendekatan STEM mewujudkan berlakunya kolaboratif pelbagai hala namun kolaboratif berlaku. Dalam Artikel 2 pula menunjukkan pendekatan konvensional dan bukan konvensional. Kajiannya bertujuan menambah pengetahuan tentang konteks studio reka bentuk konvensional selain mengenal pasti kemungkinan murid melibatkan diri dalam kajian reka bentuk. Dapatan kajian pedagogi yang sesuai untuk kreativiti adalah Pembelajaran Berasaskan Projek dan Pembelajaran Berasaskan Masalah. Dapatan kajiannya selari dengan Reka bentuk Pembelajaran. Bagi Artikel 3 pula elemen kriteria boleh dilihat berdasarkan cara menyelesaikan masalah melalui gamifikasi.

Bagi Tema 1, Reka bentuk Kriteria pula, Artikel 4,5,6 dan 7 menunjukkan kreativiti dibina melalui kolaboratif semasa strategi reka bentuk dijalankan. Namun kolaboratif yang berlaku melalui pelbagai cara berdasarkan pendapat (Taneri & Dogan, 2021) iaitu topik yang dibincangkan bersama pembimbing, cara berinteraksi bersama pembimbing dan kekerapan interaksi yang dijalankan. Artikel 4, kolaboratif berlaku melalui kekerapan kolaboratif melalui maklumat yang diperolehi semasa proses reka bentuk dijalankan. Artikel 5,6 dan 7 kolaboratif berlaku juga melalui kekerapan interaksi semasa menjalani proses reka bentuk.

Tema 2 dibina berdasarkan jenis reka bentuk yang digunakan dalam artikel pilihan. Artikel 1 menggunakan Reka bentuk STEAM dengan memberi penekanan kepada proses seni dalam menjayakan STEM. Artikel 2 menggunakan Reka bentuk Latihan Studio, reka bentuk ini dibahagikan kepada dua iaitu pembelajaran berasaskan projek dan pembelajaran berasaskan proses. Dapatan kajian menunjukkan terdapat dua dimensi dalam meningkatkan kreativiti murid. Dimensi tersebut adalah amalan reka bentuk kreatif dan perbezaan

amalan pedagogi. Manakala Artikel 3 menggunakan Pemikiran Reka Bentuk dalam gamifikasi. Melalui permainan, masalah dapat diselesaikan kerana faham dengan masalah yang dihadapi. Kajian yang dijalankan bertujuan mendedahkan guru supaya mendapat kefahaman tentang pemikiran reka bentuk. Artikel 4 dan 5 menggunakan pendidikan reka bentuk dan kolaboratif dapat meningkatkan kreativiti murid. Artikel 6 menggunakan Rangka Kerja Kecekapan Reka Bentuk dengan merungkai proses pemikiran reka bentuk seperti yang ditunjukkan dalam jadual. Manakala Artikel 7 menunjukkan Kecekapan Reka Bentuk. Kecekapan Reka Bentuk adalah kemahiran menggunakan pendekatan reka bentuk untuk meningkatkan kreativiti. Anetta (2021) Pemikiran reka bentuk ialah satu cara untuk menyelesaikan masalah secara kreatif.

Tema 3 adalah berdasarkan keunikan setiap artikel dalam mengetengahkan kaitan kreativiti dan pendekatan reka bentuk. Artikel 1 mengetengahkan proses seni visual dalam pendekatan STEM. (Liu & Wu, 2022) terdapat keperluan memahami masalah ketika menerapkan elemen seni dalam STEM. Artikel 2 menyatakan pembelajaran yang sesuai untuk meningkatkan kreativiti selari (Pan et al., 2023) menyatakan bagaimana pembelajaran berasaskan projek dan proses menyumbang kepada peningkatan kreativiti seseorang. Dalam Artikel 3 pengalaman berkarya melalui gamifikasi sedikit sebanyak membuka peluang untuk guru menggarap pengajaran menggunakan pendekatan reka bentuk dengan baik. Artikel 4 memfokuskan fungsi kolaboratif dalam pendekatan reka bentuk dan Artikel 7 pula merupakan kesan bimbingan guru dalam proses membina idea semasa pendekatan reka bentuk digunakan. Artikel 5 dan 6 memberi penekanan tentang proses yang terlibat semasa pendekatan reka bentuk digunakan.

Kesemua artikel menunjukkan strategi yang digunakan untuk menjayakan pemikiran kreatif dan persamaan semua artikel adalah pendekatan utama yang digunakan iaitu Reka Bentuk. Jika diteliti terdapat pelbagai pendekatan reka bentuk yang telah digunakan untuk meningkatkan kreativiti. Umum mengetahui bahawa reka bentuk mempunyai kaitan dengan kreativiti. Ini dijelaskan oleh (Hu et al., 2021) bahawa pemikiran kreativiti boleh dibina melalui pelbagai cara antaranya kemahiran menggunakan pelbagai jenis pemikiran, proses membina idea dan strategi yang digunakan untuk membina proses pembinaan idea. Disokong oleh (Wingard et al., 2022) menyatakan pendekatan reka bentuk ini merupakan strategi pembelajaran yang aktif, aktiviti berkumpulan secara 'hands on' dan memberi keselesaan kepada murid serta meningkatkan kreativiti.

Proses Pemikiran Kreatif yang melalui pendekatan reka bentuk melalui beberapa elemen dan elemen utama adalah penyelesaian masalah dan dibuktikan melalui kenyataan (Sameti et al., 2022) menyatakan idea yang kreatif dapat menyelesaikan masalah. Kreatif dalam kenyataannya merujuk banyak penyelesaian yang dijumpai untuk menyelesaikan sesuatu masalah namun mencari penyelesaian yang paling sesuai merupakan satu perkara yang mencabar. Selain penyelesaian masalah, pemikiran kreatif juga dibina melalui kolaboratif iaitu perbincangan bersama individu-individu yang terlibat.

Perbezaan kreativiti. Kreativiti dibina melalui empat elemen iaitu (van Broekhoven et al., 2020) and the magnitude and nature of those differences, among university students. More specifically, we examined differences in creativity within and between: (a) menyatakan terdapat perbezaan antara kreativiti dalam penghasilan produk (sains tulen) yang menyumbang kepada perkembangan pengetahuan manakala berbeza dengan penghasilan produk (kejuruteraan dan teknologi) yang lebih kepada penyelesaian masalah.

KESIMPULAN

Kesimpulannya, strategi pengajaran atau pendekatan reka bentuk yang digunakan dapat meningkatkan pengetahuan murid selain dapat menyelesaikan masalah. Selari dengan definisi kreativiti oleh (Swanzy-Impraim et al., 2022) iaitu kreativiti adalah menukarkan idea kepada realiti, penemuan baharu, atau penyelesaian masalah. Walaupun kreativiti dalam seni visual mengetengahkan konsep kreatif yang menjurus kepada nilai estetik karya. Namun kenyataan (Swanzy-Impraim et al., 2022) yang menyatakan terdapat empat persepsi

keaktiviti iaitu genetik atau persekitaran, bakat, pengetahuan dan kemahiran yang digilap, dan peniruan membuktikan guru sebagai peneraju utama dan individu yang mempunyai kuasa anatomi untuk memastikan pengajaran yang dijalankan mempunyai impak dalam pemikiran kreativiti murid dan ini disokong lagi dengan kenyataan Tran et al. (2022) kebolehan kreatif tidak tetap dan boleh bertambah baik melalui latihan dan bimbingan yang merangkumi proses reka bentuk berulang. Guru boleh menggarap strategi pengajaran yang menggalakkan murid bukan hanya menghasilkan karya untuk mencapai nilai estetik tetapi juga meningkatkan kemahiran murid berfikir kreatif dalam menyelesaikan masalah. Contohnya, pedagogi pengajaran dan pembelajaran yang berkesan dalam bilik darjah ialah menggunakan senario dunia sebenar dan aktiviti penyelesaian masalah. Pendekatan ini boleh memberi pelajar aplikasi kemahiran baharu dan idea yang lebih baik dan sesuai dalam kehidupan mereka di luar bilik darjah. Selari dengan kenyataan, Chen Lian Ling (2020) menunjukkan bagaimana strategi khusus dapat melaksanakan STEAM dalam pengajaran. Antara cadangan kajian pada masa akan datang adalah mengkaji keperluan atau asek bahan bantu mengajar yang dapat meningkatkan kreativiti murid.

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THE EFFECTIVE OF SMART PIANO TO ENHANCE PIANO SKILLS IN CHILDREN

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ABSTRACT

This study aims to explore the potential benefits and effectiveness of incorporating smart pianos into the piano learning process for children. The research investigates the impact of smart piano teaching on enhancing piano skills among children. The participants of this study consist of students aged 4 to 6 years who are enrolled in a piano learning programme that incorporates smart pianos. The research examines the students' progress over a designated period, comparing it with a control group using traditional piano instruction methods. The findings of this study contribute to an understanding of the benefits and limitations of smart piano education in piano education. The results reveal that smart pianos provide interactive learning experiences, including visual feedback, practice assistance features, progress tracking, and individualised learning options. These features positively impact students' engagement, motivation, and overall piano skill development. The implications of this research suggest that smart pianos can be a valuable tool in piano education, enhancing students' learning experiences and promoting their overall musical growth. The study calls for further research with larger sample sizes and a longer duration to validate and extend these initial findings.

Keywords: Smart piano, primary school students, piano skills, music education

INTRODUCTION

With the impact of the new technological revolution and the spread of the global COVID-19 epidemic, smart education has gradually become a hot spot (Zhou, 2021). A smart piano is the embodiment of the integration of modern science and technology with traditional music. It makes use of new technology to innovate and develop a piano career that is more suitable for teaching than traditional piano and, at the same time, helps to improve the efficiency and quality of piano teaching (Li, 2022). Under the background of "intelligence+Internet," it is no longer a dream to popularise smart piano equipment, and more and more families choose to accept smart pianos (Yi, 2021). The traditional mode of piano education in primary school in China is primarily collective teaching, such as individual piano teaching or group piano teaching, which attaches great importance to the cultivation of students' piano playing skills and related theoretical knowledge. It emphasises the importance of "imitation" (Yi, 2021). The form of collective face-to-face teaching can speed up the teaching progress, improve students' self-confidence in playing, and help to create an interdependent teaching environment (Dochy, 2021). However, some things could be improved in the current piano course education. First, it restricts and hinders the cultivation of students' creative thinking. Second, it cannot stimulate interest in piano learning, and third, it lacks interactivity in the classroom (Wang, 2022). Nevertheless, the smart piano not only retains the tone and feel of the traditional piano but also adds many smart functions, such as game functions, animation videos, and rich curriculum resources and music scores (Liu, 2021). In this approach, students have increased their interest in the learning process, which solves the problem of traditional music lessons. Therefore, this paper will focus on the application of smart piano supported by information technology in colleges and universities. It will explore a new type of piano by profoundly analysing the evolution process of smart piano, comparing it with traditional piano teaching and

its unique smart technology. The new teaching mode of piano courses provides some reference for future smart piano teaching.

Research status of smart piano teaching at home and abroad

In the abroad literature, the researcher only found two aspects of articles about the description of smart pianos. Previous studies have shown how to combine the expert system with the most advanced music recognition software and multimedia output equipment at that time to provide a learning environment suitable for beginners of piano according to the needs of students (Dannenberg, 1990). Moreover,

Holland S. discussed that music is an open field that needs teachers and students to explore constantly. This paper mainly discusses the main ways of the application of artificial intelligence in music education (Holland, 2000). In the domestic literature, the earliest research on smart piano can be traced back to past studies; Li Ping (2005) summarised the teaching mode and development process of smart piano and explored the direction of China's piano education reform. Immediately after that, Wang (2006), from the perspective of multiple intelligence theory, reflected on the model of group piano lessons in regular schools and proposed a way to reform: provide a strong starting point, provide appropriate analogies, and provide multiple representations of core ideas. It is a manifestation of smart music education. Qian (2014) explained the importance of smart piano to piano learning through the analysis of piano performance and piano accompaniment.

Through theoretical research on smart piano teaching, the future development of smart piano is prospected, which has particular significance for our research on smart piano. In addition, domestic scholars have carried out research on the application of smart pianos in specific educational activities. For example, Liu (2016) started from the current situation of music online education, built a "micro-music" network platform, and elaborated on the specific content. "Micro-music" models for children's piano education are described and evaluated. On the basis of defining the attributes of the piano instrument, Chen R. (2017) further explained the difference between the smart piano and the traditional piano from the perspective of the development history of the instrument piano, and further explained the difference between the smart piano and the traditional piano from the perspective of the practicality of the instrument teaching, and discussed the "intelligence" in depth. Related issues, and discusses the practicability of smart pianos and the impact of smart pianos on "teaching and learning," and predicts the popularity and evolution of smart pianos in the future development process. Wen (2018) narrated the practical application and advantages of the "VIP online piano sparring terminal" APP in piano teaching by analysing the practical problems of piano children during practice, confirming that the sparring APP has played a perfect auxiliary role in piano teaching and can solve the practical problems that arise in students' piano practice. Chen (2019) analysed the current main software implementation methods of smart pianos, including music scores, playback, error correction, and scoring systems, and summarised the main implementation modes of smart pianos so that this new method can be better applied to piano teaching. The advantages and disadvantages of smart piano teaching have also been studied. For example, Liu (2016) introduced the advantages of the "Micro Music" interactive smart piano platform in piano teaching. The platform focuses on user experience and satisfaction. It can not only provide children with the high-quality teaching resources they need but also understand children's subjective learning requirements, follow up on their current learning levels, and formulate targeted teaching, supervision, and guidance plans, as well as giving timely answers to questions, these teaching contents make the "Micro Music" platform pay more attention to students' user experience, learning effects, and support services, allowing children to complete learning tasks in games.

Smart Piano Functions

Smart Musical Score

In the smart piano, as long as the copyright is purchased, all the piano music scores from ancient times can be stored in the built-in computer of the piano in the form of electronic music scores, which can be searched according to the search. Music scores can be directly displayed and read through a 4k ultra-high definition display screen. Large-screen, full-high definition staff and film display screens protect children's eyes. Displaying four pages of music scores on the same screen can help children reduce piano music flipping troubles. When playing, the music score is displayed on the screen at the music stand position (Wente, 2016). Moreover, some models of smart pianos can automatically turn pages according to the player's playing progress. In the smart music score, the player can also adjust the size and colour of the symbols, such as notes, speed marks, dynamics marks, etc., according to his own preferences. For example, it is difficult for children to recognise the traditional music score. The paper version of the music score needs to be bigger, and it is difficult for piano children to distinguish the position of notes on the staff. Then, on the smart music score, children can increase the size and proportion of the music score according to their requirements (Müllensiefen, 2015). In the process of playing, the intensity marks can be marked in red according to one's preferences, such as "FF," "SF," and other accent marks. Once the player sees the red mark, it will be quickly identified as the accent playing method; Weak tone marks such as "PP" and "MP" are marked with green. Players will play a weak tone when they see the green mark. Other marks, such as "presto" and "Legato," can be personalised (Morgan, 2019).

Smart Piano Sheet Music

Smart Piano Sheet Music is also a significant feature of some smart pianos. Firstly, it has an automatic error correction system. System Smart Piano can analyse the precise audio data that the player has played by putting it into the melody recognition module. Additionally, the smart piano system has a light-following mode that can detect each note the player plays during performances, allowing it to accurately assess intonation, rhythm, speed, completeness, expressiveness, and technical level in all aspects (He, 2021). Only when the correct note is played will the next light be turned on. The smart music score will follow along with the students' playing, and red marks will denote the incorrect notes, while green marks will denote the correct notes. In addition, the AI smart sparring function is divided into two modes: class and practice. In class mode, children choose songs according to their needs and carry out targeted learning step by step according to smart voice prompts; AI sparring partners can also analyse the places that need to be practised according to the children's playing situation and scientifically practise with the baby. In the practise mode, children can choose break-up practise, clause practise, and fun practise independently (Yu & Yang, 2020). Each phrase has two modes: "reading music" and "slow practice." "Reading music" ensures that every sound is played correctly from the beginning. In the process of "slow practice," there are metronomes and accompanying music so that piano practice is not boring. The smart evaluation function in the practice mode can smartly correct the rhythm and intonation problems in children's practice and automatically generate an evaluation report so that preschool children and parents can know about piano practice in time (Konovalova, 2019). Through virtual reward, the function evaluation can make children feel successful, make them master piano practice methods in a relaxed and happy atmosphere, avoid wrong sounds, and fall in love with piano practice (Cheng & Southcott, 2022).

Playback recording and video recording

Most piano players play as the main body, listening to their melodies with their ears while playing. However, in the process of playing, it is difficult for players to separate their energy to feel the sound effects of their playing repertoire because most of their attention is focused on playing and technical processing (Becker, 2021). Especially for beginners, it is not easy to distinguish the wrong sounds in the process of playing, let alone feel the

contrast between strength and weakness, speed and speed. Therefore, the playback and recording functions of the smart piano can be outstanding. To solve this problem, teachers can choose the function of playing back the video and recording after the students finish playing a song and let the students listen to their playing repeatedly, pointing out the problems and creating a more intuitive teaching effect (Creech, 2019).

Entertainment function

In the era of the Internet, in order to further stimulate students' interest in learning piano, the smart piano software designer specially added the link design of the game, which can make most students learn piano in a relaxed and pleasant learning atmosphere. For example, the game "Waterfall Flow" means that students can freely choose to play songs in the game (Bobbe et al., 2021). For most students, by playing the piano and practising according to the prompts of LED lights, they can learn music easily and quickly, improve their sensitivity to music and stimulate their interest in learning. For example, some smart pianos are introduced into the course through picture-book animation, connecting the learning of each lesson with the animation story in the series, combining the game breakthrough with learning music theory knowledge, and matching it with four different practice methods: follow-stop, slow-speed, rhythm, and playing. Some also design the learning method of "Kara Piano", which is basically equivalent to the gameplay of "rhythm master" and "dance troupe". Students can choose the one on the smart piano (Zheng, 2022).

Piano tuning

Piano tuning not only requires accurate tone but also requires that all mechanical parts of the piano be debugged so that the excellent performance and musical effect of the piano can be fully exerted. Traditional pianos need periodic tuning to maintain their performance (Lincoln, 2019). However, in the aspect of the smart piano, by implanting the work of the intonation meter into the smart piano, the computer will compare the sound actually emitted by the piano with the sound stored by the computer and bring out the sound with pitch deviation to guide the tuning. This function enables beginners to have a standard pitch hearing in the piano enlightenment stage and can save the tuning cost (Shuo & Xiao, 2019).

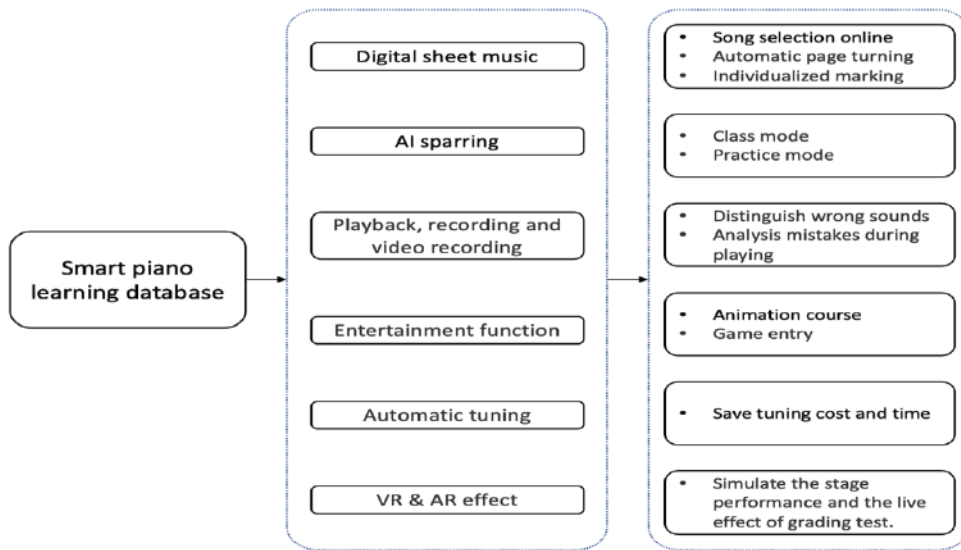
VR & AR Effect

When users wear VR devices, they will be temporarily separated from the actual space, from a bystander to an immersive learner, directly immersed in learning. In addition, in the visual experience, the VR imaging will be more stereoscopic and clear, and every detail of the teacher's actions in the video can be clearly seen so as to receive a better teaching effect. In order to improve students' initiative and entertainment in learning piano, many online teaching software companies have developed VR piano games. Students can find a balance between game scenes and natural scenes and enhance their sense of experience and fun (Shuo & Xiao, 2019).

With the application of AR technology in piano teaching, more and more students will use this function before participating in the competition. AR technology can superimpose virtual scenes into reality and simulate the real environment, such as the competition scene and the grading test (Bobbe et al., 2021). With the support of Internet of Things technology, audio equipment is used to dub the host, judges, and audience according to the competition process, creating a more immersive artistic environment. Through portable devices, students can practise virtual exercises in advance of the practice process and overcome their nervousness and other emotions. AR technology can help students improve their performance abilities and psychological adaptability (Liu & Tu, 2020).

Figure 1

Smart Piano Learning Database

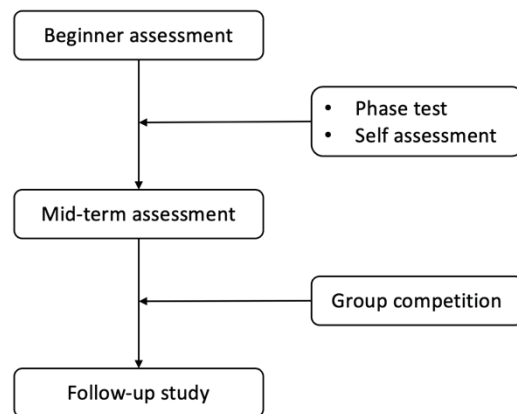


Smart Assessment

The evaluation function of a smart piano refers to the ability to score smartly according to the intonation, intensity, rhythm, and duration of students’ performances. Students’ smart evaluation can be divided into three stages: the first stage is to evaluate beginners, and students who use smart piano for the first time should evaluate their piano level, hobbies, and expectations, while students who are essential in piano can choose the difficulty to test in smart piano (Zhang, 2022). In the second stage, a study plan suitable for the current stage will be selected according to the student’s achievements. One-to-many group teaching can be used for junior students, while one-to-one teaching can be used for middle and senior students. After a period of study, take the midterm assessment (Bruggeman, 2022). In the third stage, group PK can be used to stimulate students’ learning enthusiasm through competition among students. In addition, students can evaluate their learning satisfaction through self-assessment. Hence, teachers can make some improvements in the teaching process (Cosi, 2020).

Figure 2

Smart assessment system



Research Process

Smart Piano Teaching Model

There are three kinds of teaching models on the smart piano platform: physical teaching, online teaching, and self-study. The first and second classes are smart piano group courses, and the third and sixth classes are smart piano individual courses. The last class was to examine the result of students learning, and it used the smart piano scoring function to let students have a piano competition in this phase. More importantly, it can adjust teaching progress depending on learning results and detection data, which is entirely to the smart piano's advantage.

Learning Content and Skills

In the initial stage, students mastered the background and style of the melody. Play the notes and musical terminology in the piece with accuracy and master the fundamental aspects of music, including pitch, dynamics, and fingering. Combining network and multimedia tools with piano instruction can help students absorb music-related information, enhance their overall creative accomplishment, gain a deeper comprehension of musical compositions, and develop more acute hearing. Solo performances can be challenging, as different composers' and genres' works call for varying degrees of expertise. Thus, the greatest priority is to master rational and scientific practice methods and get beyond performance skill challenges.

Self-study Phase

After the teacher assigned the task, the students read related text materials, such as the composer's introduction and melody creation background, which can help students understand the melody quickly. Next, students watched performance videos from famous pianists and instructional videos. Besides, students read fingering and notes of the melody to study complicated tricks in the melody, such as chord progression, multi-part playing, and interval jumping. The students tried to practise at a slow pace at first. They can make an online appointment for one-on-one guidance from teachers if they encounter unsolvable problems. The computer determines the qualification rate of fundamental musical elements like pitch and rhythm when they can be played entirely. After that, modify your study strategy and direct your students to practise in a specific way.

Online and physical teaching

Students have mastered basic fingering and rhythm through self-study. In online or physical classes, teachers listen to the whole piece from a student and explain performance methods and processes, especially the difficulties and skills of this work in the class. After receiving instruction from teachers, students completed this work thoroughly. The computer and the teacher then provided a thorough evaluation of the student's learning outcomes, making it easier to plan future studies.

METHODOLOGY

The teaching method used a smart piano as a teaching platform, which was divided into three stages: self-study, online learning and classroom teaching. The computer fully utilised the teaching benefits of the smart piano by adjusting the teaching process in real-time in accordance with the learning scenario and detection data. As a public university teacher in China, the researcher will use students from different piano classes as participants, and they were willing to join in this smart piano study. As such, to verify whether it is feasible to apply the smart piano to piano teaching in universities,

Design 1: The first experiment design is a smart piano teaching course, and the piano solo is used as a teaching case. In this study, the researcher takes Mozart's K545 Sonata in

C major I as an example. The first and second classes adopted the form of a smart piano group class. The rest of the classes used the form of smart piano individual classes. In the first- and second weeks of teaching, primary teaching was conducted, including creation background, composer's style, melody rhythm, etc. In the third week, the students tried to perform the melody and add emotional expression. Next, the students could play faster and find problems in their playing. They can make an appointment for an online class to solve their problems. In the end, the smart piano assessed the piano competition function in the sixth week, as shown below in Table 1.

Design 2: The second experiment design is a traditional piano teaching course and uses the same melody as the first experiment. The first and second classes adopted the form of a traditional piano group class. The rest of the classes used the traditional individual piano class format. The researcher collected teaching feedback from students and examined student completion. In the sixth week, in combination with the students' acceptance ability and essential piano playing ability, the teacher evaluated the students' performance level and gave a mark, as shown below in Table 2.

Through design analysis and comparison with the same teaching content and different class teaching forms, it is evident that the teaching effect of smart piano is far better than that of traditional piano teaching based on the received teaching feedback and the data of teaching practice. The first week is similar to the second week in terms of student recognition and student completion. However, starting with the third week, with regard to traditional piano teaching, the teaching effect of students' feedback could have been better, and student completion was increasingly decreasing, namely 50% in the sixth week. In comparison, student completion data for smart piano teaching reached 100%. This study demonstrated that a smart piano teaching approach can stimulate students' enthusiasm and increase interaction in the class. The diverse functions of a smart piano make up for traditional piano teaching, which makes full use of its advantages.

When comparing the traditional piano teaching approach to the smart piano teaching approach, the smart piano teaching approach has some feasibility. In traditional piano teaching, conveying knowledge orally or in text is the primary way. While pictures and video are the main conveyance in intelligent piano teaching, this method is more direct and understandable for students. It can motivate students' enthusiasm and activate their interest in piano, especially for beginners. In addition, students can take part in piano tests and competitions through a smart system, which is conducive to examining study results and strengthening weaknesses on time. As such, smart piano teaching takes advantage of traditional piano teaching; it not only stimulates students' auditory and visual but also increases the standards for the quality of student learning, broadens the path available to students for information acquisition, and enhances the effectiveness and quality of instruction.

Table 1

Smart piano teaching-take Mozart K545 Sonata in C major I as an example

Teaching time (week)	Course form	Teaching content	Teaching method	Student Recognition	Teaching feedback	Student completion
First	smart piano group course	Melody introduction	1. Explain the composer's style 2. Explain the creation background	Generally	Clear perception of the melody	100%
Second	smart piano group course	Music analysis	1. Teacher demonstrates playing 2. Students can read music scores 3. Use the smart piano to play rhythm	Generally	Students' playing rhythm has improved	100%

(Continued)

Teaching time (week)	Course form	Teaching content	Teaching method	Student Recognition	Teaching feedback	Student completion
Third	smart piano individual course	Student practical	1. Use the automatic error correction function of smart music score to view practice errors 2. Use the playback function to find out the rhythm problem	Excellent	Improve the efficiency of playing the piano.	80%
Fourth	smart piano individual course	Playing emoticons	1. Add emoji to playing 2. Use the playback function to find out the emoticons problem	Excellent	Limited music performance	85%
Fifth	smart piano individual course	Playing speed	1. Play the music at the original speed 2. Use the playback function to find out the speed problem	Excellent	Speed training can be carried out following the automatically played tracks of the piano only	90%
Sixth	smart piano individual course	Performance competition	1. Use the smart piano scoring function to let students have a piano competition	Excellent	Greatly improves the motivation for piano practice, and the smart piano competition is very interesting	100%

Table 2

Traditional piano teaching- take Mozart K545 Sonata in C major I as an example

Teaching time (week)	Course form	Teaching content	Teaching method	Student Recognition	Teaching feedback	Student completion
First	Traditional piano group course	Melody introduction	1. Explain the composer's style 2. Explain the creation background	Generally	It is difficult to remember	100%
Second	Traditional piano group course	Music analysis	1. Teacher demonstrates playing 2. Students read music scores 3. The teacher leads the students to play rhythm	Generally	Boring in playing rhythm	100%
Third	Traditional piano individual course	Student practical	1. Students contact, and teachers provide one-to-wone manual guidance 2. The teacher summarises the common problems and demonstrates the correct rhythm and sound pattern again	Good	Less targeted guidance and practice inefficiency	70%

(Continued)

Teaching time (week)	Course form	Teaching content	Teaching method	Student Recognition	Teaching feedback	Student completion
Fourth	Traditional piano individual course	Playing emoticons	1. Add emoji to playing 2. Students mark expression marks on paper music scores	Generally	Insufficient expressiveness, easy-to-ignore expression marks	65%
Fifth	Traditional piano individual course	Playing speed	1. Use the metronome, and the students play at the normal speed	Bad	Playing skills are less affected by pre-teaching	70%
Sixth	Traditional piano individual course	Performance competition	1. Students perform in a competition, and teachers score	Bad	There is no motive in the competition, and the teacher's scoring is too subjective	50%

CONCLUSION

In the context of a smart environment, smart piano is an indispensable product in college teaching. Students will get rid of mechanised and simplified smart piano teaching through functions of smart system (Niu, 2021). This study compared the difference between traditional piano teaching and smart piano teaching in the six weeks of teaching. Research has found that children who use Smart Pianos experience significant improvements in piano skills. Their improvement includes technical ability, music theory understanding, sight-reading ability, and overall musicality. At the same time, through the observation during the research process, the smart piano has a positive impact on children's motivation and participation in piano learning. You can discover the interactive features, gamification elements and progress-tracking mechanism of the smart piano, which can improve children's enthusiasm for practice and cultivate a sense of accomplishment. Additionally, the study could highlight the importance of effectively integrating smart technologies into music education. It can provide insights into best practices for incorporating smart pianos and related technologies into teaching methods to optimise their impact on the development of children's piano skills. The result indicates that smart piano teaching is more effective, whether in cultivating musical emotion or training piano playing speed. Future work should include an exploration of the combination of smart piano and traditional piano teaching approaches and making the most of their advantages.

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ONLINE COLLECTION FUND PLATFORMS: PEOPLE'S VIEWS ON "ASNAF CARE"

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ABSTRACT

Asnaf Care was introduced by the Kedah State Zakat Board (Lembaga Zakat Negeri Kedah or LZNK) on March 29, 2020. Asnaf Care is a fundraising system that uses an online system connected to the Internet. One of the purposes of Asnaf Care is to raise charity funds or donations to help the community in Kedah affected by the COVID-19 pandemic. Through this fund, LZNK aims to help 700,000 families. Nevertheless, judging from the data gathered by the Asnaf Care system, the collections could be more encouraging. This development is quite worrying and needs to be seriously examined for the factors and reasons that led to this situation, namely the passive contributions to the Asnaf Care fund among the people of Kedah. Following the situation, a study was conducted to identify the factors that could contribute to the awareness of online charity contributions, especially for the Asnaf Care fund. The findings of the study can be used to suggest some recommendations to the Kedah State Zakat Board on methods to spread awareness of online contribution among the people of Kedah so that the collection of Asnaf Care can be increased and able to achieve the target set by LZNK. This study used a questionnaire form as an instrument. A total of 250 respondents for this study are targeted at those aged 18 years and above and from various walks of life. Descriptive statistics are used to explain the results or findings of this study.

Keywords: Zakat, online collection, collection, online donation, donation, acceptance, trust, asnaf care.

INTRODUCTION

Famine or lack of food is one of the catastrophes feared by people of all countries worldwide. This situation poses a threat to any government facing it. It occurs when a country is cut off from its food supply or unable to produce food resources for various reasons. It can happen because of civil war in a country, like in Somalia, or it can also occur because of attacks by outsiders on a country, like in Iraq and Afghanistan. It can also occur due to natural disasters such as earthquakes, volcanic eruptions, major floods, and various natural disasters that destroy food sources or obstruct food supply from reaching the disaster-stricken area. One form of tragedy that is now plaguing the country, resulting in food shortage or, if not curbed, may result in famine, is the spread of disease outbreaks such as COVID-19 (Kementerian Kesihatan Malaysia, 2019; Kementerian Kesihatan Malaysia 2021). This unexpected and unprecedented outbreak of the disease worldwide has also affected the provision of food supplies to the affected population due to the failure to anticipate the epidemic's effects.

Under normal circumstances, Malaysia is not a famine-stricken country, and even if there is so, the case of those who lack food could not be considered famine. The issue related to food shortage in the country is more of an isolated and individual case. However, something unexpected happened at the end of 2019 and the beginning of 2020: the Covid-19 pandemic hit the world, including this country. As a result of the pandemic, economic activities were disrupted, and many were affected due to the loss of their

source of income. The outbreak also caused communities to be quarantined and their daily activities restricted. It affected the income of both low-income and middle-income earners. The loss of the ability to carry out economic activities affected the ability to pay for food supplies. Although there have been no conflicts of war or natural disasters, the epidemic has significantly impacted people's ability to obtain food continuously. Those in the lower-income group felt a more negative impact, compounded by their loss of jobs and opportunity to get jobs.

As one of the efforts to help those communities affected by the COVID-19 pandemic, as well as actions that restrict their movement to find sources of income, the Kedah State Zakat Board (LZNK) has established a public contribution system called "Asnaf Care". It is a system of collecting donations via the Internet, alms, and contributions from a community member who wants to help supply food to those in need. It is not a collection of "zakat" from the public, even though the Kedah State Zakat Board manages it. Zakat is the obligatory payment made annually under Islamic law on certain kinds of property and used for charitable and religious purposes. At the same time, Asnaf is the party eligible to receive Zakat assistance collected from Muslims.

Figure 1

Asnaf Care (asnafcare.com.my)



Problem Statement

The Kedah State Zakat Board introduced Asnaf Care on March 29, 2020. This collection system was introduced to facilitate the collection of donations to help "snap" those affected by the COVID-19 pandemic. The purpose of this system is to ensure adequate zakat funds when needed, especially during times such as the COVID-19 pandemic. This is due to an expenditure deficit of RM 8 million to meet these needs (Noorazura Abdul Rahman, 2020). During the launch, Asnaf Care aims to collect RM 32,946,000.00, which is in the form of staple foods such as rice, sugar, biscuits, sardines, cooking oil, soy sauce, sauce, tea leaves and vermicelli. Asnaf Care also targets fundraising for cash vouchers worth RM10, RM50, RM100, RM500 and RM1000. However, the amount collected was still low six months after its launch. Up to September 2020, only RM 621,260.90 or 1.89 per cent of the original target could be collected (Asnaf Care, 2020). The total collection is still far off at 98.11 per cent. Looking at the problem stated, a study is needed to identify factors contributing to the low and lethargic Asnaf Care online contribution among the people of Kedah. This study wants to see the perception and acceptance of online fundraising among the people of Kedah. This study also intends to obtain information related to questions such as the effectiveness of zakat fundraising through online fundraising and the public's views on online fundraising. The findings of this study can provide recommendations to the Kedah State Zakat Board to improve the way and process of disseminating and raising awareness among the people of Kedah on channelling contributions through online funds.

Trust or confidence in the information technology used (Schuster et al., 2017) can also contribute to a program receiving a lacklustre or low response. This may be due to an individual's perceptions of each person's unique views on something (Karabulut, 2016; Van, 2020). However, the awareness may also depend on the user's past experiences. Some may feel that the online collection or donation process could be more suitable for implementation. The role of the Kedah State Zakat Board is also important in educating the community by promoting and informing the community on its activities. A well-informed society can change its perception and acceptance of something or a service (Mohd Zool Hilmie Mohamed Sawa et al., 2017; Tontus, 2020). If trust exists, acceptance may increase (Herman, 2019; Irfan Muhammad Iqbal, 2020). The possibility that the awareness to contribute or give alms already exists among the Malaysian community, but at the same time, several factors may arise and hinder the absolute success of such a program.

RESEARCH OBJECTIVES

1. To identify the level of awareness of zakat fund collection through the "Asnaf Care" online collection method among the people of Kedah.
2. To identify factors that influence the collection of "Asnaf Care" zakat funds online collection method among the people of Kedah.

METHODS

The quantitative research method is used in this study, using a questionnaire as an instrument that focuses on the young workforce aged 18 years and above. The age of 18 is made the minimum guideline because the age of 18 is categorised as the adult age, according to Act 21 (Age of Majority Act, 1971). A total of 250 respondents among the population of Kedah were selected for this study, consisting of various age groups and various employment sectors throughout the state of Kedah. Descriptive statistics were used to explain the findings of this study. The justification for selecting 250 respondents is based on the "Rule of Thumb" proposed by Roscoe (1975) as quoted by Sekaran (Sekaran, 2003), wherein determining the sample size, the simplest rule in selecting the sample size for most research is as small as 30 and as large as 500. Therefore, the sample of this study met those requirements.

Data collection for this study was done through the distribution of online questionnaires for six (6) months to the target group. The data collection period of this study took a relatively long time due to the constraints in obtaining the cooperation of respondents following the COVID-19 pandemic. Accordingly, from the original target, only 221 respondents provided complete feedback and cooperation in this study.

The questionnaire of this study uses five (5) "Likert Scale" (Bernstein, 2005). Starting with a scale of 1 as the most disagree and a scale of 5 as the most agree.

FINDING AND DISCUSSION

1) Demographic Profile

Table 1

Demographic Profile

Label	Stats / Values	Freqs (% of Valid)
Age	1. 18 - 29	32 (14.50%)
	2. 30 - 39	66 (29.90%)
	3. 40 - 49	69 (31.20%)
	4. 50 - 59	48 (21.70%)
	5. 60 and above	6 (2.70%)
Gender	1. Male	85 (38.50%)
	2. Female	136 (61.50%)
Occupation	1. Self-employed	9 (4.10%)
	2. Retiree	4 (1.80%)
	3. Student	21 (9.50%)
	4. Public Sector	161 (72.90%)
	5. Private Sector	26 (11.80%)
Income	1. RM1,000 - RM 3,000	43 (19.50%)
	2. RM10,000 and above	12 (5.40%)
	3. RM3,001- RM5,000	51 (23.10%)
	4. RM5,001-RM8,000	60 (27.10%)
	5. RM8,001-RM10,000	32 (14.50%)
	6. No Income	23 (10.40%)
Marital Status	1. Married	171 (77.40%)
	2. Single	43 (19.50%)
	3. Widower / Widow	7 (3.20%)

Table 1 shows a total of 221 respondents who answered the questions of this study. This study found that 69 people, or 31.2%, respondents aged between 40-49 years old. 66 respondents (29.9%) aged between 30-39 years. A total of 48 respondents (21.7%) were aged between 50-59. In contrast, 32 respondents were young people aged between 18-29 years, and 6 people (2.7%) were respondents aged 60 years and above. Therefore, overall, the dominant age group is 40 years and above. Based on the study results, more than half of the respondents, namely 136 (61.5%), are female. At the same time, 85 people (38.5%) were male respondents. As for the respondents' occupation or field of employment, the study showed that more than two-thirds of the respondents are from the public sector, which is 72.9% (161 respondents). In comparison, other fields of employment showed less than one-third of respondents working in the private sector (26 people; 11.8%), students (21 people; 9.5%), self-employed (9 people; 4.1%) and retirees (4 people; 1.8%). As for the monthly income of the respondents, the data shows that 60 people (27.1%) of the respondents earned between RM5,001 - RM8000. 51 people (23.1%) have an income between RM3,001 - RM5000. The rest have income between RM1,000-RM3,000 (43 people; 19.5%), RM8,001-RM10,000 (32 people; 14.5%) and no income (23 people; 10.4%). For an income over RM10,000, there are 12 respondents (5.4%). In general, 64.7 % of respondents have a monthly income of more than RM3,000.00. The results of the study showed that more than two-thirds of the total number of respondents, namely 171 people (77.4%), are respondents who were married. Meanwhile, 43 (19.5%) respondents are single, and 7 (3.2%) are widows or widowers.

2) Awareness of the Asnaf Care Program

Table 2

Asnaf Care Program Awareness

Label	Stats / Values	Freqs (% of Valid)
1. I have heard about the Asnaf Care program from the Kedah State Zakat Board (LZNK).	1. NO	99 (44.80%)
	2. YES	122 (55.20%)
2. I am aware of the existence of the Asnaf Care campaign by the Kedah State Zakat Board (LZNK).	1. NO	102 (46.20%)
	2. YES	119 (53.80%)
3. I know of the objectives of the Asnaf Care campaign by the Kedah State Zakat Board LZNK	1. NO	116 (52.50%)
	2. YES	105 (47.50%)
4. I know that the latest trend of alms/ donations for needy people is done online.	1. NO	26 (11.80%)
	2. YES	195 (88.20%)
5. I understand that Asnaf Care targets collections in staple foods such as rice, sugar, biscuits, sardines, cooking oil, soy sauce, sauces, tea powder, vermicelli, and others for those in need.	1. NO	109 (49.30%)
	2. YES	112 (50.70%)
6. I know that Asnaf Care also aims to raise funds for cash vouchers amounting to RM 10, RM 50, RM 100, RM 500, and RM 1000 to help those who need help.	1. NO	139 (62.90%)
	2. YES	82 (37.10%)
7. I am a zakat payer at the Kedah State Zakat Board (LZNK)	1. NO	45 (20.40%)
	2. YES	176 (79.60%)
8. I have heard about the Asnaf Care program from information at the mosque.	1. NO	172 (77.80%)
	2. YES	49 (22.20%)
9. I have heard about the Asnaf Care program through social media.	1. NO	100 (45.20%)
	2. YES	121 (54.80%)

Table 2 shows the findings on the awareness of the Asnaf Care program. In terms of the level of awareness of respondents on the Asnaf Care program, it was found that almost 45% of respondents had never heard of this program. As for the statement of the existence of the Asnaf Care campaign, the percentage who did not know about the existence of the Asnaf Care campaign increased to 46.2%. This statement is further strengthened by the number of respondents who do not know about the objectives of Asnaf Care, which is 52.5%. Almost all respondents know the latest trends in charity and online donations, which is 88.2% of respondents. For the Asnaf Care collection target, the number of respondents who do not know and are aware is almost the same; that is, those who do not know is 49.3%, and the number who are aware is 50.7%. As for the collection in the form of cash vouchers, the number of respondents who do not know about it is 62.9%, compared to the number who know about it, which is 37.1%. The study's results also show that 79.6% of the respondents are LZNK zakat payers. The study's results also showed that most respondents, namely 77.8%, had never heard of the Asnaf Care program through information disseminated by the mosque.

Furthermore, 45.2% of respondents had never heard of the Asnaf Care program through social media. This percentage is quite high and is unfavourable for the information distribution environment nowadays. Overall, it was found that only half of the respondents were aware of the Asnaf Care program.

3) Acceptance of Asnaf Care

Table 3

Asnaf Care Acceptance

Label	Stats / Values	Freqs (% of Valid)					
1. I support efforts to raise funds online.	Mean (sd) : 4.6 (0.6) min ≤ med ≤ max: 2 ≤ 5 ≤ 5 IQR (CV) : 1 (0.1)	2	:	2	(	0.90%)
		3	:	14	(	6.30%)
		4	:	48	(	21.70%)
		5	:	157	(	71.00%)
2. The concept used is to facilitate charity among Malaysians, especially residents of Kedah.	Mean (sd) : 4.7 (0.6) min ≤ med ≤ max: 2 ≤ 5 ≤ 5 IQR (CV) : 1 (0.1)	2	:	1	(	0.50%)
		3	:	12	(	5.40%)
		4	:	44	(	19.90%)
		5	:	164	(	74.20%)
3. Doubts about the ability of the online contribution system used by the Kedah State Zakat Board (LZNK) to some extent affect the smooth running of the Asnaf Care program.	Mean (sd) : 3.6 (1.2) min ≤ med ≤ max: 1 ≤ 4 ≤ 5 IQR (CV) : 2 (0.3)	1	:	16	(	7.20%)
		2	:	16	(	7.20%)
		3	:	72	(	32.60%)
		4	:	56	(	25.30%)
		5	:	61	(	27.60%)
4. I feel that the online collection or donation process is suitable to be implemented by the Kedah State Zakat Board (LZNK).	Mean (sd) : 4.5 (0.8) min ≤ med ≤ max: 1 ≤ 5 ≤ 5 IQR (CV) : 1 (0.2)	1	:	1	(	0.50%)
		2	:	4	(	1.80%)
		3	:	20	(	9.00%)
		4	:	56	(	25.30%)
		5	:	140	(	63.30%)
5. Donating online makes it easy for me to do charity work.	Mean (sd) : 4.6 (0.6) min ≤ med ≤ max: 1 ≤ 5 ≤ 5 IQR (CV) : 1 (0.1)	1	:	1	(	0.50%)
		3	:	13	(	5.90%)
		4	:	50	(	22.60%)
		5	:	157	(	71.00%)
6. I am comfortable with online collection despite no contract process.	Mean (sd) : 4.5 (0.8) min ≤ med ≤ max: 1 ≤ 5 ≤ 5 IQR (CV) : 1 (0.2)	1	:	1	(	0.50%)
		2	:	4	(	1.80%)
		3	:	24	(	10.90%)
		4	:	50	(	22.60%)
		5	:	142	(	64.30%)
7. I like Asnaf Care's 'Road Tour' promotion.	Mean (sd) : 4.3 (0.8) min ≤ med ≤ max: 1 ≤ 5 ≤ 5 IQR (CV) : 1 (0.2)	1	:	1	(	0.50%)
		2	:	1	(	0.50%)
		3	:	46	(	20.80%)
		4	:	62	(	28.10%)
		5	:	111	(	50.20%)
8. The campaign to donate to Asnaf Care using video clips increased public interest in donating to the fund.	Mean (sd) : 4.4 (0.8) min ≤ med ≤ max: 1 ≤ 5 ≤ 5 IQR (CV) : 1 (0.2)	1	:	1	(	0.50%)
		2	:	2	(	0.90%)
		3	:	26	(	11.80%)
		4	:	64	(	29.00%)
		5	:	128	(	57.90%)

Table 3 shows the results of the study findings related to respondents' acceptance of the Asnaf Care program. The respondent's acceptance of the effort to raise funds online is high at 71%, and the concept used to facilitate charity among Malaysians, especially residents of Kedah, is accepted by most respondents, which are 74.2%.

There is a need for improvement in the ability of the online donation system used by LZNK to some extent to affect the smooth running of the Asnaf Care program. The findings support this statement that 85.5% of respondents are sceptical about the ability of the online contribution system used by the Kedah State Zakat Board (LZNK), which affects the smooth running of the Asnaf Care program.

However, most respondents, namely 97.6%, felt that the online collection or donation process is suitable for LZNK implementation. The respondents' statement further supports this: donating online facilitates the respondent's intention to do charity which is 99.5%, and the respondent is also comfortable with online collection even though there is no face-to-face contact process 97.8%.

As many as 99% of respondents liked Asnaf Care's 'Road Tour' promotion. The campaign to donate to Asnaf Care using video clips to increase public interest to donate to the fund received support from 98.7%.

CONCLUSION

In conclusion, the respondents' awareness level on the Asnaf Care program was found, that almost half of the respondents had never heard of this program. Similarly, the people of Kedah have yet to discover the existence of the Asnaf Care campaign. Not knowing about the existence of the Asnaf Care program also makes the people of Kedah not know the program's objectives. As such, this situation is one of the contributing factors to the unfavourable response to the Asnaf Care fundraising. The slow response to the Asnaf Care fund is due to respondents who did not listen, never knew about the existence of the Asnaf Care program, and indirectly needed to learn the objectives of the Asnaf Care program. Most Kedah citizens know the latest trends in charity and online donations but need to learn about the form of donations through the Asnaf Care program. Because many people have yet to learn about the form of Asnaf Care contribution, it became one of the factors that contributed to the very low amount of contribution. The effectiveness of information disseminated through the mosque also needs to be improved because the Asnaf Care awareness campaign through the mosque is low. Respondents who have never heard of the Asnaf Care program through social media are quite high, which is unfavourable for the information distribution environment. Overall, it was found that only half of the respondents were aware of the Asnaf Care program.

Based on the feedback from respondents on online contributions, respondents generally accepted and acknowledged the method's effectiveness. The statement of most respondents (85.5%) who doubted the ability of the online donation system used by LZNK but at the same time felt that the online donation process was suitable to be implemented by LZNK (97.6%) indicated that there are weaknesses in the online donation system used by LZNK to fund Asnaf Care. This is compounded by the fact that 99.5% of respondents feel it is easy to do charity even though donations are collected online and feel comfortable even though there is no face-to-face contract process when making donations online. In other words, what restricts donors from donating to the Asnaf Care fund is their doubts about the capabilities of Asnaf Care's online donation system.

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THE PWDS EMPOWERMENT MODEL THROUGH ENTREPRENEURSHIP IN MALAYSIA

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ABSTRACT

Empowering people with disabilities (PWDS) is an important agenda for a developed country that practices an inclusive policy. Issues about PWDs and initiatives to elevate this group have been investigated for quite some time. However, the efforts undertaken so far have not yielded a satisfying outcome in solving PWD problems. Accordingly, this study was conducted to identify the different perspectives of various stakeholders related to PWDs and how to empower PWDs and develop a model that describes the role of each stakeholder in helping people with disabilities to engage in entrepreneurial activities. Utilizing the Social, Human Rights, and Interactional Model enables the research to be conducted using a qualitative design. Data was collected through semi-structured interviews and focus group discussions with PWDs who have ventured into entrepreneurship, supporting agencies, employers, and disabled family members themselves. The data obtained was analyzed using thematic analysis. The findings reveal that five elements boost the involvement of people with disabilities in entrepreneurship: family members, support agencies, employers, PWDs who have been involved in entrepreneurship, and self-motivation of PWDs. The findings can contribute to a new policy related to PWDs in Malaysia and research on marginalized groups such as disabled people. The limitations and suggestions for future research are also discussed in the paper.

Keywords: Entrepreneurship, entrepreneurship model, inclusive policy, people with disabilities

INTRODUCTION

Disabled people are a vulnerable group in society who, if they do not receive proper attention, have the potential to fill the lowest space in society due to their mental or physical disabilities. Just as the non-disabled, people with disabilities should have the opportunity to enjoy their civil, political, social, economic, and cultural rights equally. However, as compared to other vulnerable groups such as women, children, and indigenous people, the focus on empowerment among disabled persons is still new and is rarely addressed as a major concern in society. This is evident from society's general perception towards disabled people, where comments and remarks made towards PWDs are still overwhelmingly negative and cast doubt on the requirements and potential of disabled people to participate fully in society. In general, most PWDs experience two main problems, mainly the stigma towards them and societal discrimination. The stigma that often occurs is more inclined towards negative elements, including doubts about their ability to perform a job and the community's negative attitude towards people with disabilities when voicing their views on an issue or matter around them.

The World Health Organization (WHO) (2022) estimated that there are 1.3 billion people (16%), or 1 in 6 people worldwide, experiencing a significant disability. This number continues to increase due to the escalating non-communicable diseases and longer life expectancy. Persons with disabilities are a diverse group, and factors such as sex, age, gender identity, sexual orientation, religion, race, ethnicity, and economic situation affect their life experiences and health needs. Some PWDs die up to 20 years earlier than those without disabilities. They have poor health and experience more limitations in everyday functioning than the non-disabled.

The current statistics revealed that out of 34,371,905 million of the Malaysian population, there are 637,537 persons with disabilities (Department of Social Welfare, 2023). This represents about 1.9% of the total Malaysian population. The department defines PWDs as long-term physical, mental, intellectual, or sensory disabilities. In 2007, Malaysia established a Policy on Persons with Disabilities to increase their involvement and contribution to the country's growth. To further improve the group's welfare, Malaysia enacted the Persons with Disabilities Act in 2008. In 2010, Malaysia was among the first countries to ratify the Convention on the Rights of Persons with Disabilities adopted by the United Nations General Assembly (Nurhidayah et al., 2017).

Meanwhile, the statistics released by the Public Service Department (PSD) show that up to June 2016, there were 619,273 disabled employees in the public sector. Of these figures, five were in the top management group, 900 from the professional and management group, and 2541 from the executive group. Of that number, a total of 1621 people (physical disabilities), 25 people (mental), 770 people (various), 276 (hearing), 677 people (vision), 36 people (speech), and 41 people (learning).

Although there are efforts shown to ensure the welfare of PWDs, there are still many people with disabilities in Malaysia who are unemployed, and those who are working earn low wages even though they have academic qualifications. To make matters worse, cases of discrimination (whether by employers or colleagues) are still prevalent despite the existence of the Malaysian Disability Act. This proves that the Act has not protected Malaysians with disabilities from discrimination and exploitation (Khoo et al., 2013).

Thus far, the Malaysian government has strongly committed to empowering disabled people through different measures since 1988. However, efforts to implement the PWDs' policy are difficult to realize quickly. For example, until 2014, the participation of disabled people in the employment sector had not yet reached the One Percent Policy. The 1988 policy of one percent employment opportunity was strengthened by Service Circular Number 16 of 2010, which went into effect on December 15, 2010.

The ongoing stigma that leads to discrimination against people with disabilities in sectors such as education and employment, as well as the facilities that could ease PWDs to access buildings and public infrastructures, are still crucial problems that need to be addressed, as these negate their rights to receive appropriate treatment from the authorities and the community. Besides, it is also important to look back and examine the categories and types of disability as this could help us identify the difficulties that PWDs encounter in their lives. This, in turn, would help in identifying their needs, especially their ability to be independent.

It is statistically evident that entrepreneurship is lower among PWDs than among people without disabilities (Ortiz & Olaz, 2019). Within Malaysia, research on people with disabilities participating in entrepreneurship is scarce, and information regarding their participation, as well as their accessibility to the resources that can help them enter entrepreneurship, is not readily available. Until now, the study of entrepreneurship in PWDs in terms of competencies is unusual in the field of entities and organizations of the social sector, both in collective and associative manifestations of entrepreneurship, so it is necessary to resort to the competencies that they are self-attributed, and that can encourage the group of PWDs (Ortiz & Olaz, 2021). Our main aim is to develop an entrepreneurial model that can increase the ability of PWDs to venture into entrepreneurship.

In general, the number of disabled employees in the public and private sectors has not met the target of the One Percent Policy for the involvement of disabled people in the employment sector. Thus, our study hopes to highlight the problems faced by disabled people in the context of enabling them to support themselves either by seeking a job suitable for them in public and private sectors or through entrepreneurial activities, especially digital businesses. This research is also important as it determines the economic or entrepreneurial activities of disabled people as the lowest class in society, aiming to

provide sustainable life opportunities for the community at the bottom of the national wealth pyramid as an effort to empower households with sustainable life opportunities. In achieving the research objectives, we specifically focused on PWDs and employment, PWDs and entrepreneurship, the perception of supporting agencies, and the role of family members were discussed.

We hope the present research will fill the gap related to the elements required to propose a model that can comprehensively help people with disabilities who choose to be involved in entrepreneurship. As many have discussed, entrepreneurship is recognized as a catalyst for innovation and increased productivity, essential not only to the growth of the national economy but also to ensure a competitive edge in the global market. Thus, entrepreneurs have significant roles in the economic growth of a country. Through their entrepreneurial skills, they help to solve many problems and take steps to correct market deficiencies. Entrepreneurs provide new goods and services and create more and newer jobs (Prang & Ophen, 1995). In this sense, job opportunities increase in number and diversity (Norasmah & Faridah, 2010).

LITERATURE REVIEW: SELF-EMPLOYMENT, ENTREPRENEURSHIP AND DISABILITY

Before further discussions on self-employment, entrepreneurship, and disability, we will first highlight the challenges faced by the PWDs. This is crucial as understanding the challenges would help further understand the overall problems that need to be solved.

Challenges of PWDs

Disability is seen as a situation that reduces an individual ability to perform normally, which can be observed from their behaviour, interaction, movement, skills, or inability to perform personal care. The “complex, dynamic, multidimensional and contested” nature of disability (WHO & World Bank, 2011, p. 3) makes it more difficult to define disability (Mitra, 2006). However, the United Nations Human Rights (1975) explains that the disabled person includes any person unable to ensure by himself or herself, wholly or partly, the necessities of a normal individual and social life because of deficiency, either congenital or not, in his or her physical or mental capabilities. The UN Convention on the Rights of Persons with Disabilities (UNCRPD) recognizes that “disability is an evolving concept” (UNCRPD, 2006, p. 1). “Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others” (UNCRPD, 2006, p. 4).

The challenges of living due to barriers, oppression, and isolation of PWDs have produced a new politics of disabled people abroad (Oliver, 1990). These are widely discussed in the Social Model of Disability (SMD). The model has succeeded in shifting the debate on disability from a biomedical perspective (Medical Model) that dominates the definition of a person’s disability, which assumes that disability can be fixed like a machine according to the norms of society itself. The Medical Model (MM) considers that the main problem faced by individuals with disabilities is the inability to work and participate fully in society due to physical conditions (Hughes & Paterson, 1997; Rahahleh et al., 2021).

For SMD, the inability of people with disabilities to engage in society is due to systemic barriers, negative attitudes, and exclusion by society. This perspective is very contrary to the principles of the MM. This means society is the main factor contributing to crippling someone (John, 2002) instead of being caused by a person’s disability, as in the MM. The SMD also views people with disabilities as a minority group who are often victims of discrimination, stigma, social isolation, oppression, and marginalization and face many social obstacles to participate in society fully (McLaughlin & Kuno, 2011). For example, employers have a negative view towards disabled people who cannot be independent and need the help and support of others. People with disabilities are considered less

productive because of their disability. Movement problems and slow reactions will hinder their work process.

PWDs face various problems that hinder their way forward. Apart from the problems described above, the negative community response is another problem faced by people with disabilities. They are considered unable to cooperate with normal people and are usually looked down upon by others. This normally leads to them having low self-esteem to mix with the non-disabled. Besides, disabled family members can also be seen as another reason that adds to their problem. Families who are too busy, too concerned, and lack confidence that the disabled person will be able to be independent or perform their work can add more problems to PWDs. This leads to families caring for disabled people and ensuring their welfare without educating their children to be independent. To the families, this is just enough. This leads them to face economic instability due to a lack of job opportunities and access to education. Additionally, the lack of facilities for disabled people in most public places such as shopping complexes, houses of worship, housing estates, bus and taxi stops, and the lack of schools and teaching staff for people with disabilities also affect PWDs.

Finally, besides all the challenges highlighted above, PWDs also face policy and legal support problems. The authorities do not specify the status of disabled people from the aspect of the obligation of employers or government offices to hire disabled people as productive workers. Most involve jobs that are less confident in the ability of disabled people. For example, the public sector also does not offer many productive jobs to disabled people. This is due to their lack of confidence that employers and society can accept disabled people like normal workers, as discussed in the next section.

Self-Employment and Entrepreneurship

Employment issues among PWDs are important since PWDs who face issues such as failure to control emotions are less likely to receive social support and live independently. They are more likely to experience financial problems, often be involved in the criminal justice system and have lower academic self-efficacy than their peers who do not face the same problem (Newman et al., 2011). History has shown that PWDs have encountered great challenges in their lives, especially when they seek employment in the labour market, and this is often associated with social stigma or disapproval (Aroonsrimorakot et al., 2022). The idea of disability entrepreneurship arises since the employability of PWDs is low. More often than not, when employed, they are given a salary much lower than others who work the same jobs.

A study by Mohd Hafiz (2009) reveals that the average PWD is not satisfied with the placement and career opportunities for people with disabilities due to the lack of suitable jobs and employers' perception towards people with disabilities. This is consistent with Ang (2014), who posits that employers in Malaysia still have a lack of confidence in disabled people, as well as having a prejudiced attitude towards the ability of disabled people to work and contribute towards the development of the organization. Employers are more likely to choose disabled workers by imposing the same conditions as normal workers. Some aspects often emphasized by employers in hiring PWDs (physical) include physical and mental ability, generic skills, technical skills, and qualifications (Mohamad et al., 2010). Such perceptions could be considered inappropriate as the abilities of a disabled person and a normal person differ.

Ang (2014) argues that organizational culture is important in such cases. An organizational culture that emphasizes flexibility, social justice, and personal values, as well as diversity, is a culture that is compatible with people with disabilities where disabled people are treated better compared to a rigid and bureaucratic organizational culture. The finding supports Schur et al.'s (2009) work, which emphasized the importance of a supportive organizational culture for people with disabilities.

Although many studies seem to highlight employers' perspectives of how they view PWDs, problems and challenges faced by PWDs might come from them. For example, a study by Taheing (1996) found that the dependence of people with disabilities on the community will cause doubt and erode self-confidence to get a job, even though some of them are educated but neglected from the world of work. Many parents with disabled children do not try to help these disabled children improve their abilities. As pointed out by Norasmah (2014), the direct involvement of parents and families in supporting these children from an early age is very important. PWDs' lack of confidence relates to physical help and protection and more than that. Apart from that, in the Malaysian context, most parents do not register their disabled children under the Public Welfare Department (JKM), which makes it difficult to help and document this group.

As pointed out earlier, the direct involvement of parents and families can be viewed from both positive and negative perspectives. Amin et al. (2016) interviewed 33 women with physical disabilities twice to explore their childhood experiences. The study found that the family played an important role in helping most informants due to insufficient welfare assistance. Although most of these women depend on family for care and support, many were forced to live away from family because of various factors, including the absence of welfare assistance that provides accessible housing, education, and training. This causes them to experience physical and psychological isolation from their family members.

Findings from a study by the Ministry of Women, Family and Community Development Malaysia (KPWKM) revealed that 50 percent of disabled workers resign after six months of work. This was due to employers' lack of confidence towards the ability of PWDs to perform their jobs. In addition to the prejudiced attitude, employers also tend to impose the same conditions as normal workers if they agree to employ disabled workers, whereas this is inappropriate given that the abilities of disabled people and normal individuals are different (Norhasyikin et al., 2016).

Work tasks are another reason companies choose not to hire PWDs to work alongside them, in addition to the difficulties posed by the work environment and situations that impede the abilities of the impaired to perform (Shwu Tyng et al., 2020). Consequently, this limits the ability of disabled people to perform. In other words, the scope and types of jobs offer PWDs challenges. This is in line with the study by Hammad (2018), who outlined disability as one of the main challenges PWDs face in securing a job.

PWDs and Entrepreneurship

Although there have been PWDs who succeed as entrepreneurs, they have to face barriers before they can achieve their goals. Ortiz and Olaz's (2021) research findings indicate the relationship between assessing PWD competencies and starting up an enterprise of PWDs. Their study identifies competencies, such as optimism, service orientation, and predisposition to change, that are strategic for entrepreneurship and entrepreneurial activity. Their findings also suggest that entrepreneurs with disabilities (EWDs) have a higher self-evaluation competency.

The constraints to entrepreneurship among PWDs can be categorized into two: personal or psychological factors, which derived from the disability itself and hindered learning and the development of social skills to a full extent. This is worsened by society's lack of empathy toward these potential entrepreneurs, as a result of which they suffer from fear of failure and lack of self-esteem, self-confidence, and motivation.

Even though multiple solutions have been proposed to address these issues, members of this group still face various obstacles or difficulties in joining the job market. One of the solutions seen as viable in helping this segment of the community is through social entrepreneurship (SE), which could provide an opportunity to create employment for them. It is anticipated that SE will change the landscape of people with disabilities and, at the same time, encourage entrepreneurs with disabilities to participate in economic activities. The urgent call for the implementation of SE is because the number of individuals and

the unemployment rate among PWDs are increasing in Malaysia (Mustaffa et al., 2020). However, little or none has ventured into the sociocultural determinants of disabled persons in entrepreneurship participation (Norafandi & Diah, 2017). The lack of empirical studies that would help further understand disabled people has led to the issue of unequal rights among people with disabilities in Malaysia (Rosli, 2021).

UNDERPINNING THEORIES

We acknowledge that many studies and approaches are being utilized to discuss issues related to PWDs. For this study, we utilized the combination of Social Model, Human Rights Model and Interactional Models to describe the role of PWDs and the society in assisting PWDs to be independent. Integrating these theories is crucial to further understanding the various elements in assisting PWDs to be independent individuals who can generate income by participating in entrepreneurship activities. Integrating these theories would also enhance the social inclusion approach, which states that everyone can achieve their full potential regardless of their background. Rimmerman (2013) summarizes that a meta-analysis of the use of social inclusion in disability studies relates to how PWDs (1) being accepted and recognized as an individual beyond the disability; (2) partake in personal relationships with family, friends and acquaintances; (3) involve themselves in recreation and social activities; (4) live, whether they have appropriate living accommodation; (5) being employed; and (6) being supported either formal or informally.

METHODS

This study employs a qualitative method, namely interviews and focus group discussions. Both methods were chosen for their advantage, allowing data to be obtained in depth. Interviews were conducted with five categories of respondents, namely the disabled people, families of disabled people, PWDs in entrepreneurship, employers and supporting agencies. The respondents were selected using a purposive sampling technique as these groups fulfilled the criteria set for sample selection. These criteria include registration with the Welfare Department for PWDs, families living with PWDs, registered employers, and agencies dealing directly with PWDs.

This study was conducted in seven villages in Baling. Table 1 displays the names of the villages involved in the study.

Table 1

Location of study

No.	Location
1	Kg. Rambong
2	Kg. Teluk Sanau
3	Kg. Padang Chichar
4	Kg. Padang
5	Kg. Carok Juan
6	Kg Kaki Bukit
7	Kg Simpang Empat

The data collection period took almost seven months, beginning in March 2021. , The COVID-19 pandemic because of the Movement Control Order (MCO) and flood disaster that hit Baling has prolonged the data collection period. Before the interview, participants were informed verbally about the aim and scope of the study. They were further informed that their participation was voluntary and could withdraw without consequences.

The data collection process through interviews and focus group discussions was done using an interview protocol developed for the research. Questions for the disabled group and family members were more directed towards the tendency and ability to earn a living and the skills to venture into entrepreneurship. Interviews were also conducted to identify the skills of PWDs in using technology. It could not be denied that out of a total of 28 disabled people identified in the district, many of them could not answer the questions themselves, even though the questions asked were at a low level. This is due to the disability experienced by them, especially when it comes to mental disability. Others include those with learning disabilities, autism, and Down syndrome. When interviewing children under 18 and participants with mental impairment, we thoroughly explained why we conducted the interviews and that they could withdraw from the interview at any time. We ensured that the parents or legal guardians were present during the interviews with young participants. We also aimed to keep the duration of these interviews to a maximum of one hour.

Interviews were also conducted with eight employers to identify the job opportunities that could be provided to people with disabilities, their perception towards people with disabilities and their ability to perform their tasks. Some of the employers were involved in restaurants, grocery stores, bakeries, furniture, and nursery.

Focus group discussions were conducted with entrepreneurs involved in activities such as grocery stores, small businesses such as "nasi lemak" stalls, contractors and farmers. The interview aimed to identify the problems faced in daily life, especially those who venture into entrepreneurship. A total of eight respondents were involved in this focus group discussion. Finally, we also interviewed three supporting agencies involved in dealing with PWDs' welfare: JKM, Zakat and Rumah Amal Baling. The main aim was to obtain feedback on the types of support the agencies provided and the perception towards PWDs attitude.

We conducted an inductive thematic analysis of the interview and focus group discussion data following the guidelines of Braun and Clarke (2006). A realist approach was used to report the participants' experiences, meanings, and reality. All interviews were audiotaped and transcribed. Summaries of what was discussed concerning each question in the interview guide were prepared, and quotes supporting each summary were fully transcribed. Data saturation was reached.

After reading the transcripts once, the researchers coded initial semantic themes, for example, competency in using social media. Themes were discussed and merged into one comprehensive list. As discussed in the initial section, categories were built based on previous studies and theoretical assumptions related to PWDs. Equivalent codes were combined into broader themes, and subthemes were generated. Bearing the identified themes in mind, the transcripts were re-read to identify examples from the data and check if any themes had been overlooked.

RESULTS AND DISCUSSIONS

Based on the interviews conducted with the various informants, we identified five themes related to entrepreneurship. These include (1) family support, (2) perspectives of supporting agencies, (3) employers' perception of disabled people, (4) PWDs entrepreneurship, and (5) PWDs motivation.

For family support, the categories developed were moral support, guidance, and initiative. The identified category for respondents was the motivation of PWDs to engage in entrepreneurship. The three dimensions of PWDs motivation are independent, interest and motivation. The categories identified from interviews with PWD entrepreneurs are skills, government policy and financial support. As for the employer's perspective,

the categories developed were the right attitude, suitability, skills, parental roles, and parental support. Categories developed for supporting agencies are attitude, accuracy of information, financial assistance, training and moral support. Examples of quotations related to the categories are discussed in the result section. The themes that emerged from the interviews are explained in the following subsections.

Family Support

The study results show that PWDs informants stated that family support is one of the aspects needed to motivate them to venture into the field of entrepreneurship. Three important types of family support identified are moral support, guidance, and initiative. This is evident from the following excerpts. Informant A (physically disabled) claims:

But we weren't brought up like that..we were brought up to work, right...They (referring to his family members) didn't allow. us from the beginning...We left the village at that time, leaving our parents...at home...we ran away from the village. They won't allow us to leave...They say all kinds of things...they are worried...(Informant A)

One of the respondents shared his experience about the importance of family support to enable disabled people to be independent:

He actually has support from his family as well. If you don't have the support of your family, you won't be able to get... If your family helps you ... together... like me.. I was once paralyzed because friends give me encouragement... family gives me encouragement... we can do it... we can do it... at the age of 2 years old...then at the age of 4 years old I could walk until standard 5... paralyzed for 2 weeks like that...because of my spirit...I tried. (Informant F).

When viewed from the perspective of disabled family members, they also feel worried about the future of disabled people. This is based on the view of M, who is a mother who has a disabled child with Down syndrome:

I don't know what to say. But looking at the brother who is still single, he looks ok too...thinking about it all night makes my eyes melt... (crying) ... If you want to send me for a training, you must ask the brothers first... if you want to give it to me... I want him ... (Informant M)

The researcher also found that on average, family members feel uncertain when asked questions related to the future of the disabled.

Perspective of Supporting Agencies

In the context of this study, the three supporting agencies studied are the Social Welfare Department (JKM), Rumah Amal Baling and Lembaga Zakat Negeri Kedah (LZNK). Five sub-themes identified are attitude, accuracy of information, financial assistance, training and moral support. This sub-theme is illustrated in the following excerpts.

According to one LZNK's official, zakat assistance is not specific to the disabled but covers a wider range of recipients:

Haaahh normally... it's usually like that. Basically, if he has received from JKM, but when he fills out the zakat form, we check and find that he already has been helped. We will consider the help from JKM as a source of income, usually like that. But we don't have arrr ... a special scheme like JKM for the disabled. (Informant JKM1)

One of the problems expressed by the JKM official who was interviewed is related to the attitude of the disabled:

As far as I can see, this depends on the family's help... and depends on the support we give... He doesn't want to come out of that cocoon. I got help... I feel comfortable...with that help. Like if we give the GP... they will set a limit...they will limit the salary to the set limit...like RM1200...That's the limit. (Informant JKM2)

The JKM also monitors the development of the disabled group as stated:

We'll keep an eye on it... it's like we have a training... we invite them once... but we also have a limit of once a year...the do a training... that's all... most of it they have to work on their own too... Is there any other department to do it? That's what it's all about... (Informant JKM1)

Nevertheless, the concerned parties also emphasized that the disabled themselves should strive to improve their position and quality in addition to taking the opportunities provided.

Employers' Perception of the Disabled

In the context of this study, the employer's perspective on employee opportunities that can be given to the disabled is also reviewed. Five sub themes emerged from the analysis that is right

attitude, suitability, skills, parental roles, and parental supports. The results of the interviews also show that they have a positive view of the disabled and proven based on the following passages.

In terms of employment opportunities that can be provided by his organization:

But if I am disabled, this place for me is suitable for blind people. Because people can massage his feet. They can massage the body. It is suitable for blind people. Because even when massaging, we only feel the veins. So, this is the strength of the blinds, so they can. (Informant TH)

While the employer of the tailor shop is of the opinion that she can hire skilled deaf and mute workers because:

Deaf mute...but we have to understand a little bit of their language ... but they can write. Because go to school, right? If they don't understand, they can write it down. You can communicate with them using Whatsapp... but they need to have one skill first. Go study at Giat MARA center first... then come for practical training with us... (Informant TS)

Furthermore, a respondent who runs a nursery also believes that he can provide employment opportunities for the disabled:

... if it's like in this nursery, we can let them work at the back. For example, like a seedling. For seedling, packing...is fine. If possible, sometimes this disabled person is afraid to face people...(Informant NG)

A furniture store employer also provides opportunities for people with disabilities to work:

I support it... now that there are many disabled people who are marginalized now... no matter in what segment of work we see OKU is marginalized. There are quotas in the offices now...they can do the job, right...that's one I want to find too. (Informant FS)

This is one of the examples of employers' perception of the disabled. Our findings also reveal that disabled people who have the opportunity to work and there are employers who are aware of the problems faced by the disabled and willing to hire them.

PWDs Entrepreneurship

Data analysis related to PWDs who venture into entrepreneurship is the result of interviews showing that they venture into various fields. Three categories developed from the data were skills, government policy and financial support. For example, a statement made by a disabled person in a wheelchair, namely Z, that he has been involved in many areas of entrepreneurship. Among the main problems he faces are personal problems such as lack of motivation and competition from outside.

But it's only temporary and I am not serious ... (laughs) because when there's an obstacle... mentally not very strong...the tip to succeed is that he has to be persistent... then I tell myself, you can do it. After that, I'm here..I want to say..contractor..I'm contractor. This contractor does have a job but there are times when he is unemployed, he depends on the project. And now this...plus now this...the project is stuck again..one job 200 people are competing...(Informant Z)

While F (physically disabled) is of the opinion that although the disabled are exposed to various courses, they are unable to serve the organization due to the limited employment opportunities for the disabled. He said that there are also disabled people who are skilled in the field of art but do not get proper guidance to be highlighted.

Job problem. If I look at it from experience. If I don't have a job, I can't do anything...a waste of training. An example is the sewing part... there are many people who sew... There is a disabled person who has small hands on both sides...he can draw with his legs...it's beautiful...but no one wants to help him, promote his work, take it forward... (Informant F)

This situation becomes more acute when financial institutions perceive the disabled as a group unable to repay the loan. According to him, the disabled people are able to pay the loan, but the main issue is that the sustainability of a business activity is very important. Informant A then had to close the grocery store business and is now doing breakfast business such as "nasi lemak", "nasi dagang" and "kueh muih" with his wife who is also disabled. This is based on his additional views:

No problem. Like I do all kind of things ... can do. I know how to sell fish...I sell ruit...I know how to bring a tricycle into the villages....with my children and wife. Can survive...(Informant A)

PWDs Motivation

Next, the analysis of the data obtained from the PWDs themselves is done. The results of the analysis have found three main themes independence, interest and opportunity. The PWD informant did not deny that the government held many policies related to the PWD but felt that it still failed to meet the needs of the PWD. According to Informant Z (physically disabled) this happens because many policies made do not involve the disabled. He suggested that every local authority has a representative that is made up of people with disabilities.

The government is actually doing a lot to help the disabled people...but can't get to the target, why? Because the people who are not members are put there...the place that makes the decisions...That's how I want to say...Every state should have one..that will...every PBT should have a disabled person working with them...it's disabled ... (Informant Z)

Informant N (physically disabled) also expects every disabled person to prove their own abilities and not expect too much from others. The concerned party is also expected not to look down on the disabled.

We hope so..for the disabled out there..we will try to do it..as long as we can do it. Don't expect from others. We can do it, right? Then..to what..that..Ministers what..don't be so mean...what is that..don't look down on the disabled...that's all ...(Informant N)

The guidance process for the disabled is also said to be an important element in helping fellow disabled. This is based on the view of F (physically disabled) who gives an example of one of the disabled who runs a business and has become an employer who hires other disabled people to work.

in Selangor if I'm not mistaken... He has managed to help. He is in sewing ..he has succeeded... he called his friends to work with him. In Selangor... In Setapak he opened a shop and called his friends to work with him. Work together. (Informant F) While SR (visually impaired) is of the view:

Many people with disabilities are smart. But the human capital...the human capital that is in him is not being utilized. There is a lot of waste of human resources and human capital in this group of disabled people. When the pandemic starts, they are most affected. Last week I saw on the news that a visually impaired person was arrested and charged in Kota Bahru for stealing the mosque fund. The judge sentenced him to 2 months in prison and a fine of rm1500. If you can't pay, the detention period will be increased. (Informant SR)

Informant B (visually impaired) runs a training center for the visually impaired. According to him, most people with disabilities are faced with the problem of low self-esteem:

My experience of managing the visually impaired has been 25 years, starting in 1996, until now. But I only focus on the visually impaired because I have no experience with other disabled people. I don't have the term OKU in life. Whether he wants to succeed or he doesn't want to ... most of these disabled people feel inferior. (Informant B)

People with disabilities feel inferior because of their shortcomings and the way they are treated by society. The way society serves people with disabilities was also expressed by the mother of one of her children with down syndrome (F2):

...but when he wants to pray, they don't allow... I don't know... he said they told him to sit at the back... You read it; you don't read it ... let him sit at the back ... They don't allow him to pray and sit in front. (Informant F2)

In sum, the findings revealed the various aspects of the environment that would assist PWDs to venture into potential entrepreneurship activities that would help them make a living without having to depend solely on their family members. However, getting into business is not easy and requires all parties' support. The findings have enabled a model development that explains supporting disabled people who want to venture into entrepreneurship. The model combines various perspectives of family members, supporting agencies, employers, disabled people who are already involved in the field of entrepreneurship as mentors and the motivation of disabled people themselves to seize available opportunities.

The 2030 Agenda for Sustainable Development clearly states that disability cannot be a reason or criterion for lack of access to development programming and highlights the realization of human rights. The Sustainable Development Goals (SDGs) framework includes seven targets, including persons with disabilities and six other targets for persons in vulnerable situations. The SDGs address essential development domains such as education,

employment, decent work, social protection, resilience to and mitigation of disasters, sanitation, transport, and non-discrimination, including persons with disabilities, which are important work areas for the World Bank.

In general, PWDs require assistance to live their lives. The Community Rehabilitation Program (PDK), established in the 1980s, is the finest example of empowering people with disabilities regarding independence and their capacity to engage with the community. Additionally, the independent living movement that promotes a more independent life for disabled people with the help of societal support is becoming more popular and now gives hope to disabled people to continue their lives. Upon Malaysia's signature and ratification of the Concept of Human Rights for Persons with Disabilities, there are 10 main concerns adopted under this policy and action plan that demonstrate the key principles in the Incheon Strategy: (1) Improving accessibility for individuals with impairments; (2) Empowering the disabled economy; (3) Expanding disabled access to education; (4) Expanding disabled access to health care; (5) Strengthening social services for disabled people; (6) Increasing the participation of people with disabilities in the planning and decision-making process, (7) Improving the access of people with disabilities in aspects of disaster risk management; (8) Research and development; (9) Advocacy; and (10) The Convention on the Rights of the Disabled.

In sum, this study has identified an entrepreneurial model specialized in helping people with disabilities to venture into entrepreneurship as an opportunity to become independent. This is consistent with Norasmah and Faridah's (2010) recommendations that for an entrepreneurial programme to be effective, certain factors like cognitive and non-cognitive aspects of entrepreneurial behaviour that are considered important should therefore be included.

Three major concepts are presented in this study: exclusivity, security, and empowerment. This study significantly contributes to the body of knowledge, especially in entrepreneurship and disabilities. Above all else, this research is in keeping with the Government Transformation Programme (Prime Minister's Department, 2010), as the Malaysian government aims to improve the well-being of PWDs, especially in social entrepreneurship involvement. Furthermore, the 14th NKRA of Malaysian government central agencies emphasizes that it wishes to foster a healthy, safe, and caring society that aids in the intervention of those with disabilities.

CONCLUSIONS

Overall, the analysis results have identified entrepreneurship as a field that people with disabilities can venture into to make a living and do not need to depend only on their family members. Getting into business is not easy and requires all parties' support. The theories we used in this study best explained how social inclusion works to ensure the participation of people with disabilities as empowered self-advocates in development processes and emergency responses and to address the barriers that prevent their access and participation. At the same time, the disability-inclusive data from this study represents the needs and experiences of PWDs, which is critical in aiding relevant bodies like activists and disability organisations to promote the structural changes required to raise the quality of life for PWDs. The information will also assist communities and decision-makers, such as governmental, local, non-governmental, and corporate bodies, in understanding and addressing the diverse needs of people with disabilities and respecting the ways they must be supported to participate in society meaningfully.

Our findings have also enabled the development of the entrepreneurship model that explains the various aspects needed to support potential PWDs to venture into entrepreneurship. The model combines elements such as family members, supporting agencies, employers, disabled people who are already involved in the field of entrepreneurship as mentors and the motivation of disabled people themselves to seize available opportunities.

Figure 1

Entrepreneurship model for people with disabilities



Our study, notwithstanding its merits, also has its limitations. Firstly, as the respondents only involved PWDs in Baling, the generalization is limited to only PWDs with the same characteristics. As explained earlier, there are various categories of disabled people with their abilities. Abandoned disabled people, for example, are unable to manage themselves, far from thinking about the future and the ability to be independent. This is the scope that limits the discussion of this paper.

Nevertheless, the results of this study can be used as a basis for integration into elements that can help marginalized groups such as people with disabilities. Secondly, the data collection process was done using the interview method and was conducted only once for each category of respondents. This could affect the in-depth information obtained from the respondents. Future studies could utilize the longitudinal method for data collection involving PWDs. This would enable researchers to identify further the changes in their involvement, support and welfare of PWDs.

Reviews of the literature conducted worldwide reveal a significant increase in PWD research. Despite an increase in PWD research, little is known about the difficulties researchers face in the field. Given the under-researched and scant published research on PWDs in Malaysia compared to other studies carried out in the Western arena, especially on the difficulties faced by researchers, efforts must be increased to produce more work on PWDs as this can highlight and raise society's awareness of the issues faced by PWDs. These include how sentiments, perceptions, prejudice and stigma affect PWDs' future. Future studies can also look at the effectiveness of policies introduced by the government in supporting and ensuring the welfare of PWDs.

As it involves the recognition of the rights of such a collective and the expansion of the opportunities that allow PWDs to benefit from social inclusion and the ensuing rehabilitative, therapeutic, and elevating effects that it has on them, the entrepreneurial capacity of PWDs can be of great value to society. Additionally, removing barriers to such social involvement and creating opportunities for disadvantaged groups are likely to positively affect the community (Ortiz & García, 2019). Accordingly, more research using various approaches can be conducted to help people with disabilities get involved in this field as a source of income.

Finally, as the present study also produces a model of entrepreneurial involvement among people with disabilities (as shown in Figure 1), scholars require further validation to enable the model to be applied in the context of employment opportunities for PWDs through entrepreneurship.

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WHO WILL CHANGE WHOM: THE MALAYSIAN ROAD TRANSPORT ACT'S APPLICABILITY TO AUTONOMOUS VEHICLES

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ABSTRACT

Malaysia is a fast-developing country with the potential for growth in upcoming technologies. Autonomous vehicles (AV) are an innovative technology that evokes excitement and uneasiness among the public. AV has the potential to provide many benefits, such as improving mobility and reducing the energy and emissions consumed, travel time, and vehicle ownership. The Malaysian Road Transport Act (MRTA) 1987 was enacted and designed exclusively for all human-driven vehicles, whether on the road, in the air, or above the sea. However, the provisions in MRTA 1987 are not comprehensive because they do not cater for self-driving vehicles such as AV. Laws and regulations in Malaysia, especially the Malaysian Road Transport Act, have yet to be ready for this shift. This study aims to analyse the Malaysian road transport law provided in MRTA 1987 and evaluate AV's applicability in Malaysia. This study was conducted to explore the use of AV, analyse the existing law in MRTA 1987, and determine the applicability of AV in Malaysia. This study was conducted through a library research method that is both doctrinal and qualitative. One of the factors to be considered in implementing AV in Malaysia is policy and legislation. Thus, Malaysia needs to amend the law according to the features and development of autonomous vehicles. The legal and enforcement sectors need more time to take the lead and follow the development of AV. Therefore, an organised outline or framework for adopting and applying the technology should be recognised to meet its objectives.

Background - Malaysia is a fast-developing country with the potential for growth in upcoming technologies. Autonomous vehicles (AV) are an innovative technology that evokes excitement and uneasiness among the public. AV has the potential to provide many benefits, such as improving mobility and reducing the energy and emissions consumed, travel time, and vehicle ownership.

Problem Statement - The Malaysian Road Transport Act (MRTA) 1987 was enacted and designed exclusively for all human-driven vehicles, whether on the road, in the air, or above the sea. However, the provisions in MRTA 1987 are not comprehensive because they do not cater for self-driving vehicles such as AV. Laws and regulations in Malaysia, especially the Malaysian Road Transport Act, have yet to be ready for this shift.

Objectives - This study aims to analyse the Malaysian road transport law provided in MRTA 1987 and evaluate AV's applicability in Malaysia.

Methodology - This study was conducted to explore the use of AV, analyse the existing law in MRTA 1987, and determine the applicability of AV in Malaysia. This study was conducted through a library research method that is both doctrinal and qualitative.

Finding - One of the factors to be considered in implementing AV in Malaysia is policy and legislation. Thus, Malaysia needs to amend the law according to the features and development of autonomous vehicles. The legal and enforcement sectors need more time to take the lead and follow the development of AV. Therefore, an organised outline or framework for adopting and applying the technology should be recognised to meet its objectives.

INTRODUCTION

Malaysia is a fast-developing country with the possibility of innovative technological evolution. Malaysia is currently focusing on accelerating the growth of the digital economy through Malaysia Digital. As of July 4, 2022, Malaysia's Prime Minister, Datuk Seri Ismail Sabri Yaakob, has launched Malaysia Digital.¹ Malaysia Digital is an initiative to accelerate the growth of the nation's digital economy by the Government to boost the interest of companies, talents and investment. This initiative is to enable the nation to play a leading part in the global digital economy.

Digitalisation has an impact on transportation services. Applying and incorporating multiple technologies can ease vehicle-to-vehicle information management and improve operational competency and passenger satisfaction. Autonomous Vehicle (AV) is a part of the digital economy initiative. AV is one of the technologies Malaysia wants to treasure, which evokes all sorts of feelings among the public.

On 23 December 2020, Futurise approved the seven-kilometre-long Cyberjaya Malaysia Autonomous Vehicle (MyAV) Testing Route. The objective of the National Regulatory Sandbox (NSR) initiative is to accelerate the development of AV. The project was developed by the Ministry of Transport (MOT) together with other agencies like Sepang Municipal Council (MPSepang), Road Transport Department Malaysia (JPJ), Land Public Transport Agency (APAD), Malaysian Institute of Road Safety Research (MIROS), Malaysia Automotive Robotics and IoT Institute (MARii) and Automotive Development Centre, Universiti Teknologi Malaysia (ADC, UTM).² Before the approval, at the end of 2019, MOT and MPSepang endorsed the guideline for AV Trialing on Public Roads in Cyberjaya. The guideline sketched the Safety Management Plan, including the critical safety risk and the necessary security measures.

Besides that, the NanoMalaysia Autonomous Vehicle Initiative (NAVi) and the NanoMalaysia Autonomous Delivery Robot (NAVi Delivery or NAVi-D) launched by the Ministry of Science, Technology, and Innovation (MOSTI) launched in preparation for developing technology to support the innovation and adoption of Fourth Industrial Revolution (IR4.0). The planning by Datuk Seri Dr Adham Baba, Mosti Minister, is on the development of Level 4 Autonomous Vehicles or driverless vehicles in Malaysia. NAVi and NAVi Delivery or NAVi-D are initiatives under MOSTI through NanoMalaysia Bhd to show the commitment by Mosti to steer Malaysia as a high-tech nation by 2025.³

The technology is predicted to give more benefits like lessening crashes, saving travel periods, and reducing traffic congestion. However, their deployment should follow the rules and regulations implemented in Malaysia for the public's benefit and not risk bystanders and fragile populations such as children and old folks who are inherently minor and delicate. Seri Dr. Adham Baba, Mosti Minister, is on the development of Level 4 Autonomous vehicles, or driverless vehicles, in Malaysia. NAVi and NAVi Delivery, or NAVi-D, are initiatives under MOSTI.

- 1 Arina Sofiah, 'Malaysia to accelerate the growth of its digital economy through Malaysia Digital', Human Resources Online, (5 July 2022) <https://www.humanresourcesonline.net/malaysia-to-accelerate-the-growth-of-its-digital-economy-through-malaysia-digital#:~:text=As%20of%20Monday%2C%204%20July,the%20benefit%20of%20Keluarga%20Malaysia> (6 July 2022).
- 2 Anon, 'Now it gets real – Malaysia approves first autonomous vehicle testing routes in Cyberjaya by Futurise and Ministry of Transport', Digital News Asia, (23 December 2022) <https://www.digitalnewsasia.com/digital-economy/now-it-gets-real-malaysia-approves-first-autonomous-vehicle-testing-routes-cyberjaya> (15 June 2022).
- 3 Shafiqqul Alif, 'NAVi to lead Malaysia's autonomous vehicles agenda', The Malaysian reserve' (1 December 2021) <https://themalaysianreserve.com/2021/12/01/navi-to-lead-malysias-autonomous-vehicles-agenda/> (16 June 2022)

HISTORY

The first self-driving car was created by Norman Bel Geddes in 1939.⁴ The car was an electric vehicle which was guided by radio-controlled electromagnetic fields. The concept became a reality in 1958 and was made by General Motors. The car was embedded with sensors which could detect the current flowing on through a wire embedded in the road where the sensor can detect to move the steering wheel either to the right or left. Then, in 1977, the idea was improved by the Japanese. A vehicle that can travel below 20mph uses a camera system that transmits the data to a computer to process the images of the road. In 1987, the Germans improved the idea in the form of the VaMoRs, a driverless vehicle with cameras driving safely at 56mph.

In the early 2000s, the AV industry needed to be more stable. The US Department of Defense's research arm (DARPA) sponsored a series of competitions to advance AV. In 2004, a competition was held for AV to challenge driverless vehicles on 150 miles of desert road, but no cars completed the roads. In 2007, four cars completed the route in a challenge for a 60-mile-long city location.⁵

In 2010, companies such as Ford, Mercedes-Benz, and BMW and e-hailing companies like Uber began to invest in driverless technology. However, many companies ended their service because it is difficult to achieve. In 2020, Uber withdrew from the commitment and attempt at self-driving technology for many reasons, for example, loss of cash, legal action, and safety.

As of the latest in 2021, Tesla sold the autonomous cars on the market with full self-driving packages, but the cars were not fully autonomous. The German government regretted the outcome and even asked Tesla to stop using 'autonomous cars.'

4 Bonnie Gringer, 'History of the Autonomous Car', Titlemax, (n.d), <https://www.titlemax.com/resources/history-of-the-autonomous-car/> (16 June 2022)

5 Anon, 'History of Autonomous Car', Tomorrow's World Today, (n.d), <https://www.tomorrowworldtoday.com/2021/08/09/history-of-autonomous-cars/#:~:text=At%20the%201939%20World's%20Fair,into%20a%20reality%20in%201958> (16 June 2022)

Definition






Section 2 of the Malaysian Road Transport Act 1987 (from now on referred to as MRTA 1987) means a vehicle's structure capable of moving, being moved, or being used to convey any person or thing that maintains contact with the ground when in motion. When moving, a person drives a vehicle to move or transport a person or things on land.

Classifications of Vehicles





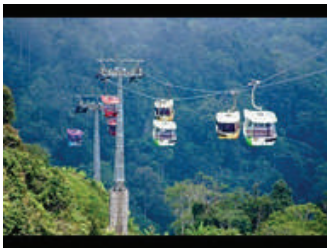

In Section 5, MRTA 1987, eleven types of vehicles are mentioned and accepted by MRTA 1987. They are in the Figure 1 as follows:

Figure 1

Classifications of Vehicles

No	Types of vehicles	Weight (kg)	Use
1.	Invalid carriages 	Unladen weight less than 250kg	It is specially designed for someone suffering from some physical defect or disability.
2.	Motorcycles 	Unladen weight less than 450kg	Vehicles with less than four wheels
3.	Tractors heavy 	Unladen weight of more than 5000kg	To carry any load such as water, fuel, accumulators and other equipment and materials used for propulsion, loose tools and loose equipment
4.	Tractors light 	Unladen weight less than 5000kg	To carry any load other than such as for water, fuel, accumulators and other equipment and materials used for propulsion, loose tools and loose equipment
5.	Motorcars heavy 	Unladen weight of more than 3000kg	To carry a load of passengers

(Continued)

No	Types of vehicles	Weight (kg)	Use
6.	Motorcars 	Unladen weight less than 3000kg	Not falling within the definition of "motorcycles") and constructed to carry a load of passengers
7.	Mobile machinery heavy 	Unladen weight of more than 5000kg	Self-contained machines are propelled using mechanisms contained within themselves.
8.	Mobile machinery light 	Unladen weight less than 5000kg	Self-contained machines are propelled using mechanisms contained within themselves.
9.	Pedestrian controlled vehicle 	-	To carry a load or passenger
10.	Trolley vehicles 	-	Vehicles derive power from overhead cables or rails connecting with the power source using the pulley or another device.
11.	Trailers 	-	Other than land implements

Based on Figure 1 above, these are the types of vehicles accepted by MRTA 1987 as vehicles and allowed by law to be used as transport to load things or passengers. Thus, these vehicles are not accepted as vehicles by law. AV is not stated clearly in MRTA 1987 as one of the vehicles legally accepted by law as a transport.

Requirements in Mrta 1987

The vehicles listed in Section 5 of MRTA 1987 should follow the rules and regulations for construction, weight, equipment, use and age-appropriate to the class or category of motor vehicle. The prohibition of not complying with the rules is stated in Section 6 of MRTA 1987.

The owner of the vehicle should follow the rules and regulations below:

the owner of the vehicle should register the vehicle before possessing or using the vehicle on the road in Malaysia according to Section 7 of MRTA 1987.

the driver of the vehicle should have a valid license according to Section 15 of MRTA 1987

according to Section 2 of MRTA 1987, the 'driver' means a person who drives a motor vehicle.

Hence, according to the rules stated in MRTA 1987, the owner registers the vehicle before possessing and using it, the vehicle should be driven by a person called the 'driver', and the driver should possess a valid driving license.⁶

Meanwhile, the AV level will make a difference by looking at AV's current development and technology. A few levels of AV would not satisfy the requirement stated in MRTA 1987. For example, AV level 5 is under control and steered up by a computer system in which the driver takes no control of the vehicle. Besides that, for AV level 5, there is no longer a need for a driver and all licenses are classified according to the driver's capability.⁷

AUTONOMOUS VEHICLE

Definition

What is an 'Autonomous Vehicle'? Autonomous Vehicle (AV), also known as self-driving or driverless vehicles, is a technology that intends to replace driving tasks traditionally performed by human drivers. AV can sense and direct the environment to the location without human guidance.

Autonomous Level

The Society for Automotive Engineers (SAE) has enumerated six levels of automation. For level 0, there is no automation, and the driver does all the driving tasks. Level 1 is called the driver assistance system. A driver assistance system is where the driver takes control of the vehicle while some of the driving assistance features are added to the vehicle. Next, level 2 is called partial automation; the vehicle has the automated function but is also engaged in the driving tasks. Generally, there is no automation between levels 0-2, and the driver needs to control the vehicle. Level 3 is conditional automation, where the driver must always be ready to take charge or control of the vehicle. Level 4 is high automation, which means that the vehicle can drive autonomously while the driver might have the option to take control of the vehicle. Level five is fully automated; the vehicle can fully take control of itself in all situations.

⁶ H.H. Hashim and M.Z. Omar, 'Towards Autonomous Vehicle Implementation: Issues and Opportunities', (21 April 2017), Society of Automotive Engineers, p 114

⁷ Nabeel Mahdi Althabhwawi, Zinatul Ashiqin Zainol and Parviz Bagherib, 'Society 5.0: A New Challenge to Legal Norms', (January 2022), Vol. 6 Issue 1, Sriwijaya Law Review, p. 51 <http://journal.fh.unsri.ac.id/index.php/sriwijayalawreview/article/view/1415/pdf>

Thus, each level represents each type of automation on the vehicle, including operational (steering, braking, accelerating) and tactical (use signal, turn, respond to any situations) aspects of the driving task but excluding strategic aspects (determining destinations and waypoints) of driving tasks.⁸

Potential Benefits and Risk

AV has several benefits and risks for society. Based on a study⁹ (what would be the most significant benefit to consumers in using autonomous vehicles?), in a survey conducted among 5700 individuals in the United States in December 2018, the highest score was 18%, where most of the respondents agreed that autonomous vehicles reduced traffic accidents. Then, 16% for decreased vehicle servicing costs, 15% for decreased expenditure on fuel, 14% for reduced energy consumption, 10% for greater access to healthcare with improved patient mobility, 8% for increased work productivity, 7% for increased free time for family and entertainment, 6% for reduced pollution (reduction of CO₂ emissions), 4% for higher vehicle flow rates on existing roads (increased lane capacity), and 2% for more efficient parking.

Besides that, referring to the risk, the implementation can endanger bystanders, particularly vulnerable populations such as children and older adults, who are inherently smaller and fragile. This caution is especially true when the system fails and is uncontrollable by humans. If the driver monitors the car, the driver may control and act when the system fails. However, an accident is unavoidable when there is no one to control the car if anything happens to the computer system or the system fails.

Therefore, the authority should consider the potential benefits and risks of implementing AV in Malaysia.

APPLICATION IN MALAYSIA

Pillars of Adapting Autonomous Vehicles and Recommendations

The guidelines of Malaysia for adopting the AV in the future vary depending on the factors or pillars to be discussed here. Malaysia should consider the four main pillars before adopting AV in Malaysia. The pillars and the recommendations are discussed as follows:

Technology and Innovation¹⁰

Many studies focus on improving AV technologies, for example, by attaching camera detection mechanisms, sensors, controlling systems, and GPS navigation to the vehicle to ensure AV can move forward in the future. However, more investment and effort to test technologies with larger passenger vehicles should be taken to equip AVs with all the necessary technologies and for AV level 5 to be implemented. The technology will eventually obtain the best result if extra effort is put in through multiple rehearsals, constant testing, and further improvements. So, this will require time and funds to deploy to the public in Malaysia safely.

8 H. Mohamed Jamil et al, 'Public Perception on Autonomous Vehicle in Malaysia', 1 September 2019, Journal of the Society of Automotive Engineers Malaysia, p. 9

9 Carolyn Riegler, 'The Moral Decision-Making Capacity of Self-Driving Cars: Socially Responsible Technological Development, Algorithm-driven Sensing Devices, and Autonomous Vehicle Ethics', 15 July 2019, 11(1), Contemporary Readings in Law and Social Justice, p. 19

10 K.A, Abu Kassim, Z. Mohd Jawi, and M. A. Nasruddin, 'Is Malaysia Ready to Adopt Autonomous Vehicles?', (January 2019), Volume 3, Issue 1, Journal of the Society of Automotive Engineers Malaysia, p. 87

So, Malaysia needs to make more investments and test AV-related technologies to equip AV with all the necessary technologies and achieve the objectives of implementing AV in Malaysia. Malaysia should be on track and advance in featuring new technologies in parallel with other international countries. Extra effort should be taken for research, rehearsal, testing, and executing improvements. Thus, the authorities will require much time and funds for the multiple tests to be safely deployed to the public in Malaysia.

Infrastructure

Besides technology, infrastructure is another crucial aspect that needs to be focused on evaluating current roads in Malaysia and its surrounding infrastructure. The very minimum requirement of AV is that it should be able to read the road ahead by understanding its path designs and road symbols. Like drivers, AV can only function well if the basic lane markings and road signs are available, compliant, torn out, hidden, unpredictable or unclear. The lane markings are the rails for AV. Various technologies used in partial automation and full AV, such as Lane Keeping Assistance (LKA) and Lane Departure Warning (LDW), read the road markings, provide cautions, and give the driver some navigation support.¹¹

Undoubtedly, Malaysian road infrastructure is not suitable for AV to operate correctly. Proper infrastructure is required for the safe deployment of AV to the public. A safe environment is required for a safe test run in Malaysia, as the technology is still early. Moreover, an established road for AV testing should be allocated for researchers, including many types of scenarios such as a narrow and congested road and rainy weather.

Public acceptance

Generally, the experts and the public are optimistic about accepting AV but also show grave suspicion towards accepting a fully automated vehicle. The public might need clarification about the safety features of AV and its protections for the public.¹² An analysis from a study of 520 respondents on public acceptance shows that the public still has uncertainties about the benefits of AV, including safety benefits.¹³ The features of an AV are explicitly designed to be safer than a human-driven vehicle by eliminating human mistakes or carelessness while on the road. Road safety is a significant matter that should be given attention to and a prerequisite for AV to be applied for public usage. Furthermore, the public has low levels of awareness and understanding of AV.

Malaysians are in doubt about this new technology because they are still determining the prospect of the AV technology due to its insufficiency. In other countries, the way to inculcate confidence and build trust in AV is by letting the public participate in testing the AV, including providing ride-sharing services. Malaysia should provide more information to the public to build trust in AV technology, share the benefits of implementing the AV and invite the public to have their test drive and feel it by themselves.

11 H.H. Hashim and M.Z. Omar, 'Towards Autonomous Vehicle Implementation: Issues and Opportunities', p 116

12 Sivak, M., & Schoettle, B., 'Road safety with self-driving vehicles: General limitations and road sharing with conventional vehicles', (2015), University of Michigan, p. 1 <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/111735/103187.pdf>

13 H. Mohamed Jamil et al., 'Public Perception on Autonomous Vehicle in Malaysia', (1 October 2019), Volume 3, Issue 4 (Special Issue), Journal of the Society of Automotive Engineers Malaysia p. 9

Policy and Legislation

This is the crucial part, where the legislation needs to be comprehensive for driverless vehicles. The current MRTA 1987 governs the law for vehicles that a driver is in complete control and accountable for vehicle conduct on the road. AV implementation would not satisfy this characteristic of driverless vehicles, for example, AV level 5. AV level 5 is a vehicle that the driver need not have to control, and a computer system drives it. Moreover, with the implementation of AV level 5, the vehicle no longer needs a driver, and no passengers would be required to have a driving license. This implementation contradicts the law stated in MRTA 1987.

The policies regarding AV need to be improved. Policymakers have a great responsibility to make a policy to guarantee a safe implementation of the AV. The policies should benefit both the technology developers and the public. Policymakers should be working in the field to get a clearer picture of implementing the AV and to ensure the technology's growth.

Even though Malaysia has MRTA 1987 as the governing law for the vehicles on the road, it still needs to be comprehensive because MRTA 1987 does not cater for technology such as AV. MRTA 1987 does not govern AV, which shows that once the law is amended, there is a gap in implementing AV in Malaysia. Therefore, MRTA 1987 should be amended to fill in the gap in the law for AV.

Current Law in Malaysia

MRTA 1989 is the principal law enacted for the regulation of motor vehicles, traffic and other road matters, such as types of approved vehicles to be on the road, requirement of driving license for drivers and requirement of vehicle registration by the owner. Meanwhile, Road Traffic Rules 1959 outlined the rules and regulations, guidelines and principles that direct the motorists and other road users on the road for effective road use and avoidance of accidents, for example, driving in a sleepy state, not giving way to ambulance or police and vehicles waiting on the yellow box.

Recently, on 6 April 2022, Guang Ming Daily reported that the police banned hands-free driving in Malaysia after a Singaporean drove a Tesla Model 3 to Penang on Autopilot. The Chief Assistant Director Superintendent, Dr Bakri Zainal Abidin from Bukit Aman Traffic Investigations and Enforcement, said the use of AV can make drivers being distracted and unresponsive to road conditions where he referred to a research report from the Massachusetts Institute of Technology (MIT). Furthermore, he reminded motorists that the Road Traffic Rules 1959 require good attitude, caution and concentration while driving. He also said that the driver still needs to pay attention and be aware of road conditions, even if AV is implemented in the future, to avoid an accident should the systems fail.

Therefore, it is clearly stated that Malaysia currently has no rules or laws against AV. Even though there is no law in Malaysia expressly on the matter, police banned the usage of AV in Malaysia based on the recent report. Police banned the usage of AVs because of safety matters. According to the police, driving without the hand on the steering is not good. There is a strict law for the drivers to stay focused while driving. The driver must always have a good attitude; preventive driving is obligatory.¹⁴ The law disallows AV usage in Malaysia for the time being, although there is an initiative to implement AV in Malaysia.

¹⁴ Florin Amariei, 'Tesla's Autopilot Got a Partial Ban From the Police in Malaysia, Here's Why', Autoevolution, (7 April 2022) <https://www.autoevolution.com/news/tesla-s-autopilot-got-a-partial-ban-from-the-police-in-malaysia-here-s-why-185809.html> (26 June 2022)

UNITED STATE'S LAW ON AUTONOMOUS VEHICLE

The United States is an example of a country that allows the deployment and testing of AVs on their public roads. The main point of the testing or pilot studies in the US is to understand AV's consequences and the public's acceptance of AV. A recent report shows that twenty-nine out of fifty states have enacted AV-related legislation.

There are many cases of AV failures. Still, one of the most famous occurred in 2018 in the US when Elaine Herzberg, a pedestrian aged forty-nine, was hit by an Uber (Volvo) self-driving car as she wheeled a bicycle across the road in Tempe, Arizona 2018. The Uber detected the woman crossing the road, and the Uber chose not to stop and continued driving until it hit the pedestrian.¹⁵ The National Transportation Safety Board (NTSB) stated that the car detected the woman six seconds before the accident but did not brake until 1.3 seconds before hitting the fatal accident. The tragic accident was the first case recorded involving AV and resulted in Uber ending its testing of the technology in Arizona.

Currently in the US, autonomous cars operating in small numbers in the US include manual controls for backup safety drivers and to meet federal safety standards. However, on 11 March 2022, the government of the US cleared the way for highly automated and selfless driving vehicles without steering wheels.¹⁶

The National Highway Traffic Safety Administration (NHTSA) issued a standing general order in 2021, which requires car companies to report crashes involving autonomous vehicles (AV) and vehicles equipped with advanced driver-assist systems (ADAS). Based on the NHTSA report, Tesla reported the most crashes involving driver-assist technology, while Alphabet's Waymo disclosed the most incidents involving its autonomous vehicles. According to the report, Tesla reported 273 crashes involving Tesla vehicles using Autopilot from 20 July 2021 to 21 May 2022. Besides that, the report shows that since Tesla introduced Autopilot in 2015, there have been at least eleven deaths in nine US crashes involving the driver-assistance system.¹⁷

For AV, NHTSA received reports of 130 crashes from July 2021 to May 2022 and Waymo, a subsidiary of Alphabet, reported sixty-two crashes, the highest in the record.

Thus, it is evident that the crash still happens and is at its peak even using the computerised system, which is opined as more efficient than a driven car. This also shows that even a computerised system can fail.

15 Kareem Othman, 'Public acceptance and perception of autonomous vehicles: a comprehensive review', (2021), AI and Ethics, page 357

16 Michael Wayland, 'U.S. clears way for truly driverless vehicles without steering wheels', (11 March 2022), CNBC, <https://www.cnbc.com/2022/03/11/us-clears-way-for-driverless-vehicles-without-steering-wheels.html> (28 June 22)

17 Andrew J. Hawkins, 'US releases new driver-assist crash data, and surprise, it's mostly Tesla', (15 June 2022), The Verge, <https://www.theverge.com/2022/6/15/23168088/nhtsa-adas-self-driving-crash-data-tesla> (30 June 2022)

CONCLUSION

In Malaysia, it is evident that there are no specific laws and regulations related to AV technologies. AV is not classified as any vehicle, as stated in MRTA 1987. However, the Ministry of Transport is planning on AV implementation in Malaysia and has prepared for that soon by 2025. The primary legislation in Malaysia for transportation operations is the Road Transport Act 1987, which specifies that every motor vehicle can only be operated by a licensed driver. To allow AV to be operative in Malaysia, amendments should be made to allow automated driving technologies to be on the road, specifically on Malaysian roads. Meanwhile, for an AV to be operational in Malaysia, the authority must review and approve that the AV has met the vehicle criteria in Malaysia.¹⁸

Furthermore, many respondents agreed that using AV will reduce crashes. Even though there are benefits of reducing crashes by using AV, the reality shows that the crashes are still increasing without human error or carelessness. This also shows that the AV system cannot be considered the last option in reducing crashes because the system will work better than humans. It is to be noted that the system also often fails to work, which can cause the worst damage to nature and others. Many other alternatives can be taken by the authorities to reduce the crashes.

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THE DYNAMICS OF INDONESIA LOCAL GOVERNMENT'S AUTHORITY TO REGULATE TAX FACILITIES IN THE CONVENIENT INVESTMENT ERA

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ABSTRACT

The dynamics of the problem of regulating the norms of tax facilities at the level of legislation are not in accordance with the principle of clarity of formulation. In addition, there is also a dynamic implementation of local government authority in providing regional tax facilities in terms of the discretionary impact of authority and the relationship between the supervision of regional legal products by the central government in the context of synchronising national fiscal policy in the era of ease of investment. Related to these problems, this research was conducted with the aim of knowing: first, what are the dynamics of the issues of Regional Taxation facilities in the era of ease of investing? Moreover, what are the dynamics of local government authority in facilitating taxation in the era of ease of investing in Law 1/2022? This research is normative juridical research. The results of this study stated that: First, the formulation of regional tax facility norms in Law 1/2022 is not in accordance with the principle of clarity of certainty principles in the field of taxation. Second, establishing regional regulations containing local governments' authority in facilitating taxation synchronising regional finances with national strategic policies and local governments can reduce tax in certain circumstances to support investment activities and ease of business.

Keywords: Government Authority, Convenient of Investment, Indonesia Local Government, Tax Facility

INTRODUCTION

The division of tax authority between the central and local governments implements the local autonomy policy (Nugroho & Yuniza, 2012). Fiscal decentralisation, one of the implications of regional autonomy, allows local governments to finance the implementation of government and regional development (Tirtosuharto, 2017), one of which is through taxation instruments (Asher, 2002). Local tax attribution authority (local taxing power) arranged coherently with Law Number 28 of 2009 on Local Taxes and Local Levies (hereinafter referred to as Law 28/2009) and Law Number 23 of 2014 on Local Government (hereinafter referred to as Law 23/2014) (Kamal, 2019). Referring to the two laws, provincial, regency and city governments (hereinafter referred to as local governments), to carry out legal actions in the field of regional taxation, need to prepare a regional regulation in accordance with the provisions of higher laws and regulations and the nature of the closed list (Achmad et al., 2015) of local taxes implies that the local government cannot regulate new types of taxes beyond those specified in the laws and regulations (Sa'adah, 2014).

In addition to the authority to collect local taxes as one of the sources of regional income (tax budgeting function) (Tita et al., 2022). The local government also has the authority to provide tax facilities in the regions as regulated in Article 95 paragraph (4) letter a Law 28/2009 that the Local Regulation on Taxes dan Levies may also provide for provisions regarding the provision of deductions, reliefs, and exemptions in some issues on the subject matter of taxes and/or sanctions. Furthermore, to provide tax facilities in the regions to

provide convenience and relief for taxpayers with certain conditions or on the basis of government policies, the local government is obliged to issue a Regional Head Regulation related to procedures for reducing or eliminating administrative sanctions and reducing or paying provisions.

The authority to reduce or eliminate administrative sanctions and tax debts as one of the region's tax facilities is essentially the discretionary authority of the local government. This can be seen from the phrase "can" in Article 95, paragraph (4) letter of Law 28/2009. The implications of this discretionary authority can be seen from the differences in norms and implementation of regional head regulations related to procedures for reducing or eliminating administrative sanctions and reducing or paying tax provisions in each local government.

In the era of Joko Widodo's precedent leadership 2019-2024, laws and regulations in the field of taxation became one of the priority programs. They underwent several changes in a short period. The laws that change the regulation of regional tax within this period include Law Number 11 of 2020 on Job Creation (Law 11/2020) and Law Number 1 of 2022 concerning Financial Relations between the Central Government and Local Governments (Law 1/2022). One of the legal politics of the promulgation of Law 11/2020 and Law 1/2022 is to make regional tax facilities an instrument of fiscal incentives to encourage the ease of investing as a national strategic policy.

The use of tax facilities as a supporting instrument for the ease of investment policy is in accordance with the guidelines for the implementation of tax expenditure from the Organization for Economic Co-operation and Development (OECD), namely the condition that policies are taken to contribute or benefit to specific industrial sectors, activities, groups of taxpayers. Nationally, the Government of Indonesia has carried out the policy of tax facilities as a fiscal instrument to achieve investment objectives, such as the Tax Holiday policy, Sunset Policy, and Tax Amnesty (Darussalam & Kristiaji, 2014).

The application of tax facilities to support investment is not only carried out by Indonesia. In ASEAN regions such as Malaysia, Singapore and Thailand from 1999-2018, government spending on tax facilities has a dampening increase in foreign direct investment and positive economic growth (Humaira et al., 2021). More specifically, providing tax facilities to increase investment and ease of business is expected to reduce economic growth inequality between autonomous regions in Indonesia and reduce dependence on central government transfer funds to regions (Tri Basuki et al., 2020).

However, the regulation of regional tax facilities through Law 11/2020, later revised by Law 1/2022, left various problems. First, the dynamics of the problem of regulating the norms of tax facilities in the regions between Law 28/2009, Law 11/2020 and Law 1/2022 are tested with the principle of clarity in the formulation of good laws and regulations and the principle of certainty in the field of taxation (Fidiana F, 2021) namely equity, certainty, convenience, and efficiency. The study conducted by using a literature review concerning the role of Omnibus Law includes tax facilities to attract foreign investment underlining strengths and weaknesses. Data is obtained through secondary sources in the form of archival reports and previous research relevant to the research. Based on the analysis of literature studies, this research produces several things. First, the principle of equity is found in adjusting corporate tax rates. Associated with the aim of attracting foreign investment, the tariff adjustment policy naturally will not be realized in 2020, where traffic between countries is restricted to prevent the spread of Covid-19. Second, in the tax policy scheme of domestic tax subject reclassification, which includes more than 183 foreigners working in Indonesia, and Indonesian citizens living abroad over 183 days are classified as subject to foreign tax. Tax is imposed on foreigners only on income earned in Indonesia. This pattern fulfills certainty principles. Third, the regional tax incentive scheme is an instrument that ensures the certainty of regional investment in line with the principles of equity and convenience. Furthermore, local tax exemptions can lower the price of consumer goods in the regions, thereby increasing the purchasing power of the wider community, which was hampered by the pandemic. In this way, local taxes play a role in increasing regional

competitiveness through public policies (tax incentives. Second, the dynamics of the implementation of local government authority in the provision of regional tax facilities are viewed from the impact of discretionary authority and the relationship of supervision of regional legal products by the central government in synchronising national fiscal policies in the era of ease of investment.

METHODOLOGY

This type of research is normative legal research. In this study, legal problems, in addition to being reviewed from existing laws and regulations, are also offered in legal settlements reviewed with current laws and regulations. The data sources used in this study are secondary data sources consisting of primary legal materials, secondary legal materials, and tertiary legal materials. This research uses data collection techniques by searching literature in books, court decisions, scientific journals, mass media, the internet, and other relevant references to answer problem formulations by approaching legislation, which is then analysed descriptively-qualitatively.

The Dynamic of Local Tax Policy Regulation in The Convenient Investment Era

Tax, from a legal point of view, is an agreement born based on legislation (Farouq S, 2018). Taxes have the function of 2 (two) main functions, namely the budgeter and regular functions (Ayzar, 2017). The budgetary function means that taxes are used as a source of income for state revenue and economic growth (Nugraha, 2013). Meanwhile, the regular function of making taxes is an instrument to bring the community to the expected condition, namely welfare (Sulastyawati, 2014). One form of tax application, the regulating function of taxes, is the provision of tax facilities from the government (fiscus) to taxpayers (Hariandja, 2020).

Theoretically, tax facilities are a form of tax expenditure, namely the transfer of resources to the public through reducing tax liabilities. According to the Organization for Economic Co-operation and Development (OECD), tax expenditure can be in the form of tax allowances, exemptions, rate/tariff reliefs, tax deferral, tax credits and others (OECD, 2010). Theoretically, tax facilities are a form of tax expenditure, namely the transfer of resources to the public through reducing tax liabilities (Burman & Phaup, 2012).

The application of tax expenditure has implications for reducing or delaying state income on tax payments. On the other hand, it reduces the tax burden on taxpayers, which in some countries is referred to as tax breaks, tax subsidies, tax facilities and incentives (Novikasari et al., 2021). The application of tax expenditure has implications for reducing or delaying state income on tax payments. However, it reduces the tax burden on taxpayers, which some countries refer to as tax breaks, tax subsidies, tax facilities and incentives (Rosdiana et al., 2019).

Table 1

Dynamics of Tax Facility Regulation in the Regions

	Law No 28/2009	Law No 11/2020	Law No 1/2022
Form of Facility	Deductions, Reliefs and Exemptions in some issues on the Principal of Taxes and/or their sanctions (Article 95 paragraph (4) letter a of Law 28/2009)	Deductions, Reliefs and Exemptions in some issues on the Principal of Taxes and/or their sanctions (Article 95 paragraph (4) letter a of Law 28/2009)	1. Relief, reduction, exemption and delay in payment of the principal and/or tax and levy sanctions (Article 96 paragraph (1) of Law 1/2022) 2. Fiscal incentives in the form of reductions, reliefs and exemptions or elimination of the principal of taxes, principal levies, and/or sanctions (Article 101 paragraph (2) of Law 1/2022)
Reasons for providing facilities	Reduction or elimination of administrative sanctions in the form of interest on fines and innocence due to the taxpayer's oversight or not because of his fault (Article 107 paragraph (2) letter a of Law 28/2009) Reducing the provision of taxes owed based on consideration of the ability to pay the taxpayer or specific conditions of the tax object (Article 107 paragraph (2) letter e of Law 28/2009)	Fiscal incentives are provided in support of the ease of investing to business actors in the regions	1. Improving the condition of taxpayers or levy payers and/or tax objects or levy objects (Article 96 paragraph (2) of Law 1/2022) 2. Supporting the policy of ease of investing to business actors in the regions by paying attention to: a. Ability to pay taxpayers and levy payers; b. Certain conditions of the object of taxation; c. Supporting and protecting micro and ultra micro-enterprises; d. Supporting local government policies in achieving regional priority programs e. Supporting Government policies in achieving national priority programs (Article 101 paragraphs (1) and (3) of Law 1/2022)
Procedures for providing facilities	1. At the Request of the Taxpayer Awarded in Office by the Regional Head	At the Request of the Taxpayer Awarded by Position by the Regional Head based on rational considerations The provision of fiscal incentives is notified to the DPRD by attaching the consideration of the Regional Head	At the Request of the Taxpayer Awarded by Position by the Regional Head based on rational considerations The provision of fiscal incentives is notified to the DPRD by attaching the consideration of the Regional Head
Technical Rules	Regional Head Regulation	Regional Head Regulation	Regional Head Regulation

Source: Processed by the author from Law 28/2009, Law 11/2020 and Law 1/2022

Local taxation rules have undergone rapid changes in a short period. Referring to Law 1/2022 as an exciting norm related to the regulation of metering and local tax formal, the authority to provide regional tax facilities remains attached to the local government. However, there is a legal, political shift in regulating regional tax facilities used as a supporting instrument for ease of investment policies (Group, 2015).

However, the establishment of laws and regulations in a legal country such as Indonesia must be subject to the principle of legality (Parikesit, 2021), which is precisely in line with the principle of clarity in the formulation of the formation of good laws and regulations and the principle of certainty in the field of taxation. One of the principles of forming good laws and regulations is the principle of clarity of formulation, which means that every law must meet the requirements of the drafting of laws and regulations, systematics, choice of words or terms, as well as clear and easy-to-understand legal language so as not to cause various kinds of interpretations in its implementation. The certainty principle is part of the Four Maxims developed by Adam Smith, which states that the tax each individual is bound to pay should be specific and not arbitrary (du Preez, 2018)

Based on these two principles, Law 1/2022, which regulates regional tax facilities as described in Table 1 above, raises various dynamics of norm problems: First, the redundancy of regional tax facility norms regulated in 2 (two) different articles, namely Article 96 and Article 101 of Law 1/2022. The two articles regulate the authority of the Regional Head in providing regional tax facilities in the same form, namely relief, reduction, exemption, elimination and delay of payments on the principal and / or sanctions of Taxes and Levies. The approach to the reasons for providing different regional tax facilities shows that the formation of Law 1/2022 is oriented towards strengthening aspects of ease of doing business and investment by overriding the harmonisation of norms.

Second, the inconsistency of norms is found in Article 96 and Article 101 of Law 1/2022, namely that there are inconsistencies in the types of facilities that regional heads can provide. Where the form of facilities for the "elimination" of local taxes and levies is regulated in order to support the ease of investing policy, while these facilities are not provided in terms of paying attention to the conditions of taxpayers or levy payers and/or tax objects or objects of retribution. Inconsistency in the mention of the subject of the authority holder is also found, where Article 96 refers to the Regional Head, while Article 101 definitively refers to the Governor /Regent / Mayor.

Third, the absence of a juridical definition of local tax facilities. Law 1/2022 states the new legal provisions related to regional fiscal policies, namely the nomenclature of Tax Facilities and Fiscal Incentives, by not providing a juridical definition in Article 1. It is further stated in Article 96 and Article 101 of Law 1/2022 that the authority of regional heads in providing relief, reduction, exemption, elimination and delay in delaying payments on the principal and/or sanctions of Taxes and Levies by not providing a juridical definition of each form of facility. The absence of such a juridical definition has implications for technical arrangements in regional head regulations. Where between regions will use non-uniform forms of facilities.

Fourth, the vagueness of the types of local taxes that can be provided with facilities. Local taxes are divided into provincial local taxes and district/municipal local taxes. Provincial governments are authorised to collect 7 (seven) types of taxes, while district/city governments are authorised to collect 9 (nine) types of taxes in their respective administrative areas. Law 1/2022 does not provide rules for types of taxes that can be the object of fiscal incentives in the context of ease of investment in the form of reductions, reliefs, and exemptions or elimination of the principal of taxes and/or sanctions. Furthermore, Law 1/2022 does not regulate investment indicators that can be provided with regional tax facilities.

The Dynamics of Local Government Discretionary Power to Grant The Tax Facilities

The implementation of regional autonomy in Indonesia has been legally regulated in the 1945 NRI Constitution and Law 23/2014 on Local Government. The principle of autonomy as widely as possible has at least been affirmed in Article 18 paragraph (5) of the 1945 NRI Constitution that local governments are autonomous regions that can carry out government affairs as widely as possible and have the right to regulate government authority except government affairs which by law are determined to be the affairs of the central government. In addition, Law 23/2014 confirms that Local Government is the implementation of government affairs by local governments and the District House of

Representatives according to the principle of autonomy and assistance duties with the principle of autonomy as widely as possible in the system and principles of the Unitary State of the Republic of Indonesia as referred to in the 1945 NRI Constitution (Schoen, 2018). This authority of the widest autonomy can be interpreted as a local government exercising its authority except for matters that have been determined to be the authority of the central government (Rudy et al., 2017).

The implementation of the broadest autonomy provides the flexibility of authority to local governments, including the authority to regulate and carry out potential resources to finance the implementation of regional autonomy. In this case, it includes the authority related to the Regional Original Income of the regional authority to collect local taxes and levies. Through this Regional Original Income, local governments are expected to be able to fund the implementation of local government and regional development, which in turn can realise equitable distribution of the welfare of local communities. Thus, it means that regions are always required to be better able to improve their PAD in order to carry out their autonomy, as well as regulate and manage their households in order to achieve the goal of equitable distribution of community welfare as expected (Fauzan, 2019).

Law 1/2022, which is the basis for collecting local taxes and regional levies, has a general regulatory nature and regulates the limits of local government authority. For enforcement for each region, Law 1/20 22 mandates that a Regional Regulation must stipulate it. This is understandable because local taxes and regional levies are just a means of regional revenue. It is the regional authority which type of regional tax and levy and the amount of the budget will be determined as a supplier of the Regional Revenue and Expenditure Budget on the basis of potential and in the context of thinking that regional tax and levies should not be counterproductive because of regional competition factors in attracting investors to their regions (Yakubova, 2013).

One of the norms in Law 1/2022, which is general and open, is the source of the discretionary authority of local governments in regulating and collecting taxes in the regions. One form of discretionary authority related to regional tax facilities is reflected in the use of the phrase "can" in the provisions of Articles 96 and 101 of Law 1/2022 related to tax facilities, which are further regulated using regional head regulations. In addition, if we look at the legal politics of the formation of a regional head regulation in the implementation of regional autonomy, it arises because of two things, namely the order for the formation of regional head regulations for higher regulations and other regional regulations, or because of the authority arising from regional autonomy owned by regional governments in organising regional autonomy.

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In providing tax facilities, it is subject to the discretionary authority of local governments. However, in the use of discretion by government officials, there is still a principle of responsibility in it. According to HR Ridwan, conceptionally, there are two fundamental things related to the principle of responsibility and the responsibility of officials about the use of discretion (Ridwan, 2014): First, the principle of the state of law, which states that every act of a governmental organ must be based on authority. This is closely related to the principle of "geen bevoegdheid zonder verantwoordelijkheid" (no authority without accountability) or "zonder bevoegdheid geen verantwoordelijkheid" (no accountability without authority). Second, two entities, namely positions and office holders or officials.

Concerning these two entities, there are known to be two types of norms, namely government norms (*bestuurnorm*) and norms of apparatus behaviour (*gedragsnorm*) (Ridwan, 2021)

The existence of these two entities in the administration of government affairs, of course, cannot be separated, so the two entities result in the responsibility and responsibility of officials (Government) also includes two things, namely personal and position responsibilities and responsibilities. The responsibility and responsibility of the office in the use of discretion may occur under the circumstances as long as the actions taken by government officials (*ambtshandeling*) are carried out within the formal environment of their authority or are carried out to exercise the authority of the office. All consequences that arise will be the responsibility of the position.

In Law Number 30 of 2014 on Government Administration (Law 20/2014), Article 1 number 9 of the Law provides the definition of Discretion as a Decree and/or Action determined and/or issued by Government Officials to overcome concrete problems faced in the administration of government in terms of laws and regulations that provide choices, do not regulate, are incomplete or unclear, and/or the stagnation of government. Furthermore, the content of discretionary issues in the AP Law is regulated in Chapter VI, Articles 22-32 (10 Articles), including content material consisting of a general part of discretion (Article 22), scope of discretion (Article 23), discretionary requirements (Articles 24-25), procedures for the use of discretion (Articles 26-29), legal consequences of discretion (Articles 30-32) (Mustamu, 2014).

The use of discretion itself has the purpose of (a) smoothing the administration of government, (b) filling a legal void, (c) providing legal certainty, and (d) filling the stagnation of government in certain circumstances for the benefit and public interest. The use of discretion may only be exercised by authorised Government Officials.

Article 23 of Law 30/2014 provides a scope of discretion that includes (a) decision-making and/or actions based on the provisions of laws and regulations that provide a choice of decisions and/or actions; (b) decision-making and/or action because the laws and regulations do not regulate; (c) decision-making and/or action due to incomplete or unclear laws and regulations; (d) decision-making and/or action due to government stagnation in the broader interest.

Against Article 23 of Law 30/2014 mentioned above, Tatiek Sri Djatmiati explained that the meaning of decision-making must be carefully interpreted because the laws and regulations are incomplete or unclear (Endang, 2018) Incompleteness relates to the formation of incomplete norms. The vague notion relates to a rule or norm called a *vage norm* or a *vague meaning*. The *vague meaning* cannot be defined. For example, the public interest is in a compelling crunch in certain circumstances. The use of discretion by government officials in Law 30/2014 also determines the terms and procedures. The conditions include (1) in accordance with discretionary purposes; (2) is not contrary to the rules of the Act; (3) in accordance with the AUPB; (4) the reasons are objective; (5) does not create a conflict of interest; (6) done in good faith. In addition, S.F. Marbun stated that freedom of action on the basis of discretion exercised by government administrative bodies/officials is not unlimited. This freedom is limited by the General Principles of Good Governance (AUPB Principles), so it is hoped that there will be no abuse of authority. However, if there is a legal deviation from the discretionary decision that causes harm to the community, then the discretionary decision must still be accounted for. This is in accordance with the principle of "*geen bevoegdheid zonder verantwoordelijkheid*" i.e. there is no authority without responsibility (Ridwan, 2009).

Although the use of discretion is possible by local governments in providing tax facilities with some limitations in Law 30/2014 above, according to the author, so that there is no potential abuse of authority by local governments and for a uniform policy to occur, at least it needs to be regulated regarding the criteria for when and how local governments can carry out the provision of tax facilities.

Referring to open norms and vague norms (vagenorm) related to tax facilities in Law 1/2022, various independent authorities of local governments appear in providing tax facilities, including:

1. The form of Regional Head Regulation (Whether or not a Regional Head Regulation regulate tax facility for each type of tax or local tax facility in general for all type of tax);
2. The content material of Regional Head Regulation (Object, the form of facilities in general, and related to ease of investment); and
3. Technical provision of facilities (issuance or non-issuance of administrative decision on the taxpayer application for tax facilities and the implementation of the provision of tax facilities due to position).

With the promulgation of Law 11/2020 and Law 1/2022, the dynamics of authority do not only occur at the local government level, but this law also gives attribution authority to the central government to conduct reviews. First, the central government can review and evaluate regional legal products that regulate the provision of incentives for tax facilities in the regions. This has implications even though the regional legal product is formed on the basis of autonomy and discretionary authority owned by local governments. However, in its implementation, there is the potential for the central government to interfere with policies made by local governments, including the potential cancellation of these legal products by the central government through the Supreme Court. This is what the author thinks can affect the authority possessed by local governments in providing tax facilities.

Second, in Law 1/2022, there is also a dynamic of authority in the government tax facilities. There is an order from Law 1/2022 that all policies related to regional finances must be synchronised with national strategic policies made by the central government. This can have implications for the limited financial autonomy of the region, and the discretionary authority possessed by local governments must be held hostage to the conformity of policies made by the central government. Neither Law 11/2020 nor Law 1/2022 should limit the wiggle room of local governments in carrying out regional autonomy, including regional financial matters.

Third, related to tax facilities provided by local governments after Law 1/2022, it must be emphasised whether the provision of tax facilities in the regions can be given only for those related to investment activities and ease of doing business in the regions, or can they be given on the basis of discretionary authority and autonomy of local governments? If you read some of the provisions above, then local governments can provide tax facilities for two reasons: to support investment activities and ease of doing business in the regions and other autonomous policies.

CONCLUSION

Based on the above explanation, it can be concluded that:

1. Dynamics of Regional Tax Facilities in the Era of Ease of Investment, namely: first, the redundancy of regional tax facility norms regulated in 2 (two) different articles, namely Article 96 and Article 101 of Law 1/2022, Inconsistencies in norms are found in Article 96 and Article 101 of Law 1/2022, namely there are inconsistencies in the types of facilities that regional heads can provide. Second, there is an absence of a juridical definition of local tax facilities. Third, it is unclear what kind of local taxes can be provided. Thus, the formulation of regional tax facility norms in Law 1/2022 is not in accordance with the principle of clarity of norms in the formation of laws and regulations and the principle of certainty in the field of taxation.
2. The vagueness of the norms of Law 1/2022 gives rise to the dynamics of the authority of local governments in the provision of tax facilities in the era of ease of investment. The dynamics of this authority include, First, the authority of local governments to provide tax facilities that regional head regulations must regulate. The implications of this policy give delegates authority that local governments can exercise but still open discretionary space. Second, synchronisation of regional finances with national strategic

policies made by the central government. Third, local governments can provide tax facilities for two reasons: to support investment activities and ease of doing business in the regions and other autonomous policies.

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CONFLICTS OVER ECOLOGICAL SUSTAINABILITY, FUTURES, AND NATURE RELATIONS IN SOCIAL CONFLICTS

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ABSTRACT

The research examines conflicts from differing views on ecological sustainability, prospects, and nature relations. It explores how conflicts over natural resources, conservation, and development strategies impact societies. The study highlights the importance of understanding the underlying values, beliefs, and interests that drive these conflicts. It underlines the need for effective communication, collaboration, and inclusive decision-making processes to address these conflicts and achieve sustainable solutions. The research emphasises the complex dynamics and interconnectedness between society, nature, and sustainable development.

The paper explores the importance of ecological sustainability and its relationship to social conflicts. It reveals that conflicts related to ecological sustainability arise due to differing perspectives on the future of our environment. These conflicts often revolve around climate change, resource depletion, and biodiversity loss. The study suggests that future solutions should promote dialogue and understanding between stakeholders, integrate ecological values into decision-making processes, and foster a deeper connection between society and nature. These solutions can help bridge the gap between conflicting groups and create a more sustainable future.

Keywords: Conflicts; prospects; ecological sustainability; nature relations.

INTRODUCTION

The research explores the social conflicts surrounding ecological sustainability and how individuals imagine and envision the potential future to deal with crises, catastrophes, and various societal relationships between humans and nature. The study examines the intersections between these themes and aims to provide insight into ways to address sustainability challenges more equitably and inclusively. Overview of the research problem and its significance: Purpose of the study: The research aims to analyse and understand social conflicts that arise in the pursuit of ecological sustainability, explore different images of the future to confront crises catastrophes, and examine the varying societal relationships between people and nature. As for Research objectives, the objectives of academic research are to investigate and analyse:

- i. -The social conflicts that arise in pursuing ecological sustainability, particularly in resource use, land use, and environmental policy implementation.
- ii. How different communities and stakeholders imagine and envision the future of confronting ecological crises and catastrophes on the one hand, and how these imagined futures shape their actions and decisions on the other hand.
- iii. The different social relations between humans and nature and how these relations impact ecological sustainability, including environmental degradation, biodiversity loss, and climate change. 4-The potential for transformative and innovative solutions to address the social and ecological challenges faced by communities and societies worldwide, focusing on building more just, democratic, and sustainable futures for all. Problem statement: to explore the complex interplay between ecological sustainability, future

aspirations, and relations with nature in social conflicts. The research aims to understand the underlying causes of ecological and sustainability conflicts and offer insights into resolving these disputes. The research also attempts to identify ways to promote more sustainable and harmonious relationships between humans and nature.

LITERATURE REVIEW

The author critiques the researchers' methodology, arguing that the sample size is insufficient for valid conclusions, the accuracy and legitimacy of the information are slanted, and a specific viewpoint influences the bias in the studies. They also note that generalizability is difficult, as the studies focus on one specific example and need more practical application. They also note that the research is theoretical and offers no concrete recommendations for social conflict stakeholders. They also acknowledge critical gaps in the logic and weak points in the assertions, such as insufficient evidence or glossing over potential objections. Additionally, the author acknowledges that previous studies ignored crucial facets of the conflicts under discussion and should have considered important social, economic, or political variables, limiting our knowledge and resolution options.

Overview of the literature on social conflicts around ecological sustainability: Social conflicts around ecological sustainability are ubiquitous in contemporary society (S Testa, KR Nielsen, S Vallentin, F Ciccullo -, 2022). The literature suggests that these conflicts often occur between groups with competing interests, such as environmentalists, resource-extraction industries, and local communities. Environmentalists argue for conserving and protecting natural resources, while initiatives seek to exploit these resources for economic gain. Local communities may hold unique perspectives, ranging from the full support of resource extraction to resistance against environmental degradation (Gravaas, P, 2023). These conflicts can lead to protests, lawsuits, and even violent confrontations.

In many cases, the root causes of social conflicts around ecological sustainability are tied to issues of power, control, and access to resources. Researchers have proposed various approaches to address these conflicts, ranging from community-based resource management to multi-stakeholder negotiations. There is also increasing recognition of the importance of integrating social, economic, and environmental sustainability in policies and development strategies to minimise tensions and promote co-existence (A Rarai, M Parsons, M Nursey-Bray, 2022). A conceptual framework for understanding imagined-shaped future to confront crises and catastrophes: The article proposes a conceptual framework for understanding how people imagine possible futures confronting crises and catastrophes. It sheds light on the significance of considering individual and collective imaginaries, the role of emotions and affective responses, the influence of social and cultural factors, and the impact of the crisis or catastrophe on shaping future imaginations (M Ojala, 2022). The framework aims to understand better how people make sense of and respond to uncertain and complex situations.

RESEARCH DESIGN

The research design commonly involves case studies, literature reviews, surveys, interviews, and participant observations. The approach involves analysing ecological sustainability's social and political dimensions, including the conflicting interests and values that shape environmental policies and decision-making processes. The research investigates how different groups, such as indigenous communities, environmental activists, and industry stakeholders, perceive and negotiate sustainability challenges. Moreover, the study examines how people imagine and construct future scenarios to deal with environmental crises and catastrophes. Researchers analyse how narratives, ideologies, and cultural norms create differing expectations and actions related to sustainability. Finally, the approach explores humans' diverse social relations with nature. The study investigates how cultural, religious, economic, and political factors shape these relations. By understanding these social dimensions, researchers hope to create more effective strategies for promoting

ecological sustainability and mitigating the harmful effects of environmental crises and catastrophes.

DATA COLLECTION METHODS AND INSTRUMENTS

The common methods and instruments utilised in this type of research include:

- i. Surveys or questionnaires: These may be administered to a large sample of participants to gather quantitative data on attitudes, beliefs, and behaviours related to ecological sustainability, catastrophes, and social relations with nature.
- ii. Interviews: Researchers may conduct face-to-face or phone interviews with individuals or groups to gather more detailed qualitative data on their experiences, perspectives, and attitudes.
- iii. Focus groups involve bringing together a small group of individuals with similar experiences or perspectives to discuss specific topics related to ecological sustainability, crises, and social relations with nature.
- iv. Document analysis: Researchers may analyse policy documents, news articles, social media posts, and other relevant texts to understand the broader context of social conflicts surrounding ecological sustainability and crises.
- v. Overall, the specific data collection methods and instruments will depend on the research questions being explored and the research design chosen by the researcher.

SAMPLING TECHNIQUE

Various sampling techniques can be used to research social conflicts over ecological sustainability, imagined futures facing crises and catastrophes, and diverse social relationships with nature. These include:

- i. Stratified sampling (H Caggiano, LF Landau, LK Campbell..., 2022): As a result, this requires dividing the population into various strata factors such as age, gender, income, and geographical location, then randomly selecting individuals from each stratum to ensure representation.
- ii. Cluster sampling: This requires separating the population into clusters or groups based on geographic location and randomly selecting the clusters for a survey or an interview.
- iii. Convenient sample method: It involves selecting individuals who are easily accessible or want to participate in the study, like the students or members of a particular organisation.
- iv. The snowball sample involves selecting participants through referrals from other participants with similar characteristics or experiences relevant to the research topic.
- 5- Purposive sampling technique: This involves selecting participants according to specific criteria such as age, gender, occupation, and level of involvement in a particular issue related to the research topic. The sampling technique chosen will depend on the research objectives, the population being studied, and the resources available for data collection.

6.0. DATA ANALYSIS PLAN

- i. Identify data sources: The data sources for this research could include books, academic articles, policy documents, online forums, social media platforms, interviews with experts, and case studies.
- ii. Gather and categorise data: All the data collected should be categorised based on themes such as social conflicts, ecological sustainability, imagined futures, crises and catastrophes, and social relations with nature.
- iii. Analyze data: The data should be analysed using qualitative and quantitative methodologies. Quantitative data can also be analysed using statistical tools such as regression analysis, while qualitative data can be analysed using thematic analysis.
- iv. Interpret data: After analysing the data, the findings should be interpreted and

conclusions drawn. The interpretations can be supported with visualisations such as graphs and charts. 5- Draw implications: The implications of the research findings should be drawn, and recommendations should be made based on these. These recommendations should resolve social conflicts, promote ecological sustainability, and foster better social relations with nature. 6 - Communicate findings: The final step is to communicate research findings to stakeholders, policymakers, and the public through scholarly articles, presentations, and reports.

RESULTS AND DISCUSSION

There is much tension between various groups about ecological sustainability, according to research into social conflicts over the environment, envisioned futures in the face of crises and disasters, and various social relationships with nature (C Riedy, S Waddock, 2022). This tension often arises from a clash between different values, beliefs, and interests and can result in conflict over resource management decisions. Furthermore, the study suggests that individuals' imagination of the future is shaped by their experiences and beliefs about environmental issues. Those who have negative experiences with environmental crises tend to imagine a bleak future. In contrast, those with more positive beliefs about sustainability tend to be more optimistic about the future (R Hoffmann, R Muttarak, J Peisker, P Stanig, 2022). Finally, the study found that individuals' social relations with nature are complex and multifaceted. Some individuals view nature as a commodity to be exploited, while others see nature as a sacred entity that deserves respect and protection. These different attitudes towards nature can contribute to conflict over resource management decisions.

DESCRIPTION OF THE FINDINGS

The research explores the social conflicts of ecological sustainability, how people imagine possible futures when facing ecological crises and catastrophes, and the various societal relationships between humans and nature. Findings suggest that these issues are highly complex and interconnected, involving competing interests and values, diverse cultural perspectives, and various social and political factors. The research highlights the importance of understanding these issues to promote effective strategies for ecological sustainability and resilience (Djurayeva, D. , 2023).

INTERPRETATION AND ANALYSIS OF THE RESULTS

The research regarding the social conflicts over ecological sustainability and imagined futures through confronting crises and disasters and diverse social relations with nature reveals that these issues are interrelated and have significant implications for society's future. The study suggests that ecological sustainability is not just an environmental problem but also a social and economic one shaped by power relations, social inequalities, and political structures. The research highlights the need for transformative change in societies to mitigate the negative impacts of ecological unsustainability. Diverse social, cultural, and political discourses that reflect people's concerns, goals, and dreams build imagined futures for coping with crises and disasters. Analysing social relations with nature shows that different societies have diverse cultural and spiritual values and practices that influence their attitudes towards and interactions with nature. Overall, the research underscores the importance of interdisciplinary and transdisciplinary approaches to addressing the complex social-environmental problems of our time.

METHODOLOGY

The project involves a multi-faceted approach that includes both quantitative and qualitative methods. Firstly, a literature review will be conducted to identify relevant concepts and theories in this field. Next, surveys or interviews could be conducted to gather data

on people's beliefs, attitudes, and behaviours related to ecological sustainability and their imagined futures. Additionally, case studies of social conflicts related to ecological sustainability could be analysed to identify patterns and underlying social dynamics. Lastly, a discourse analysis could analyse how social groups construct ideas about nature and ecological sustainability. Combining these methods would provide a comprehensive understanding of social conflicts surrounding ecological sustainability and people's diverse social relations with nature.

CONCLUSIONS

The research sheds light on the complex social dynamics that shape ecological sustainability (Z Weimin, M Sibte-e-Ali, M Tariq, V Dagar, 2022). It highlights the importance of addressing social conflicts in promoting sustainable practices. The interconnectedness of societal disputes over ecological sustainability, envisioned futures in the face of crises and disasters, and various social relationships with nature have been demonstrated via research. The struggle for ecological sustainability is often embroiled in social conflicts, such as the tension between economic development and environmental protection. How individuals and groups imagine future scenarios in the face of ecological crises and catastrophes can also influence how they respond to these events, either by taking proactive action or adopting a more passive approach. Finally, social relations with nature can vary widely across cultures and societies, with some viewing the natural world as a resource to be exploited. In contrast, others may see it as a sacred entity that must be cared for and protected. This research highlights the need for a more holistic and integrated approach to addressing environmental issues. On the other hand, it considers social, cultural, and economic factors in addition to ecological considerations.

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EFFORTS TO STRENGTHEN THE HEALTH OF THE SHARIA CAPITAL MARKET IN INDONESIA

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ABSTRACT

Islamic capital market activities are developed based on muamalah Fiqh in Indonesia. There is a rule of muamalah Fiqh, which states that all forms of muamalah are permissible unless evidence forbids it (does not allow it). This concept is the basic principle of the Islamic capital market in Indonesia. The development of the Islamic Capital Market reached a new milestone with the passing of Law Number 19 of 2008 concerning State Sharia Securities (SBSN) on May 7, 2008. This regulation is required as a legal basis for issuing state Sharia securities or state Sukuk. On August 26, 2008, the Indonesian Government issued SBSN series IFR0001 and IFR0002 for the first time. Efforts to strengthen the health of the Sharia-based Islamic capital market in Indonesia are carried out in three practical steps: Active supervision of the directors and the Sharia board; monitoring and controlling the risk of using Information Technology; and an integrated internal control system at each stage.

Keywords: Risk Management, Islamic Capital Market, Based on Muamalah Fiqh

INTRODUCTION

The capital market is a source of long-term funds, investment alternatives, a vehicle for restructuring corporate capital, and a medium for divestment (Ali, 2021). The benefits of the capital market for investors are many, including providing opportunities or rights for the public to have healthy companies with good prospects in the future and alternative investments that offer potential profits with calculated risks (Albab & Zuhri, 2019). Meanwhile, the benefits of the capital market for the business world are fostering a climate of openness for the business world, providing access to social control for companies in running their business, encouraging the use of professional management in managing companies, a vehicle for investing in the short term (liquidity) and long time (growth) and is a source of long-term financing for the company (Rasbin et al., 2015).

Dividends and capital gains are the two main goals investors want to achieve when investing in the capital market. These two goals must be greater than or at least equal to the expected level of income (Pratiwi, 2020). For the prices of shares listed on the capital market to show their actual value, efficient capital market conditions are needed (Sujana, 2017). However, risk will always exist in every investment because investors must project how much cash flow or income they will receive over the life of the investment. The expected revenue estimation is not necessarily the same as the reality because certain factors influence it (Ramadhan, 2020). A risk is a risk if certain elements can be predicted in advance. However, uncertainty is called uncertainty if the circumstances cannot be expected in advance (Silalahi, 2015).

A careful calculation is essential, especially in analysing the investment risks that will occur more deeply. In some cases, the investment losses mostly come from risk analysis, which sometimes misses the study or does not take risks well enough (Ekaningsih, 2015). Conceptually, the greater the investment value invested, the greater the chance that will

occur, or vice versa; the smaller the investment value, the smaller the risk that will be accepted. Other studies imply that the size of the risk of an investment is not significantly related to the amount of investment value but is related to how seriously investors analyse or manage risk, known as investment risk management (Rizal & Mustapita, 2022). For this reason, the author aims to discuss reputation risk management in the Islamic capital market.

METHODOLOGY

The discussion method in this paper follows the background of the problems that have been presented; the authors use a literature analysis study with qualitative methods. Qualitative research is used to investigate, find, describe, and explain the qualities or features of social conditions that cannot be defined, measured or described through a quantitative approach (Yusanto, 2020). It can be concluded that the qualitative research method is a research method based on post-positivism philosophy, used to research natural object conditions (as opposed to experiments) where the researcher is the key instrument, data sources are collected purposively, data analysis is inductive/qualitative, and the results of qualitative research emphasise meaning rather than generalisation.

The data analysis technique in this research uses descriptive analysis. Descriptive analysis is data collected in the form of words, not in the form of numbers or statistical procedures. Content Analysis (content analysis) is a research technique for making data inferences that are replicable and valid by considering the context related to the content of communication (Firmansyah & Dede, 2022). In qualitative research, content analysis emphasises how the researcher sees the validity of the content of communication qualitatively and interprets the scope of interaction communication from the research object (Wijaya, 2018).

The content analysis steps taken are as follows: (a) Determining the problem, (b) Developing a framework for thinking, (c) Developing methodological tools, and (d) Data analysis. (e) Checked for correctness and interpreted so that it becomes meaningful information. Next, after the data is collected and analysed according to the steps in data analysis, it is made in the form of a summary or conclusion (Sugiono, 2013)

LITERATURE REVIEW

Risk management

Specifically, investment risk management is divided into two: investment in financial assets and investment in tangible assets. Investments in financial assets are carried out on the money market, for example, in the form of certificates of deposit, commercial paper, money market securities (SBPU), and others. Investments can also be made in the capital market, for example, in the form of shares, bonds, warrants and others. Meanwhile, tangible assets can be invested by purchasing productive assets, setting up factories, opening mines, plantations, and others (Fadilah, 2019). Regarding investment, risk is often defined as Risk Uncertainty; this risk is defined as a risk with an uncertain value. Risk is the dispersion of actual from the expected result; this risk means the distribution or expansion of actual results from the desired or expected results. Risk is the possibility of loss; this risk means that there is likely to be a possibility of experiencing a loss. Risk is the probability of any outcome different from the one expected, which means the likelihood or probability of a product that is different from the product that is always expected (Dick et al., 2013).

Risk management strategies to manage the above risks are taken by transferring risks to other parties, avoiding or preventing risks, and accommodating the consequences of risks. Actual events can sometimes deviate from expectations. This means there is the possibility of either profitable or detrimental deviations. If both options exist, then the risk is speculative. On the other hand, the opposite of theoretical risk is net or pure chance; this risk only has the possibility of experiencing a loss and no possibility of making a profit (Humaira, 2018)

The risk manager will generally deal with pure risk and not focus on speculative risk unless the theoretical risk immediately forces him to face pure risk. Some of the main risks that must be considered in investing in general are interest rate risk (Farida & Darmawan, 2017), market risk (Tehresia et al., 2021), inflation risk (Farida & Darmawan, 2017), business risk (Nursiam & Aprillia, 2021), financial risk (Felsiana et al., 2022), liquidity risk, currency exchange rate (forex) risk and reinvestment risk (Saripudin, 2019).

In general, there are six risk management objectives in a company or business entity, including protecting the company, helping to create a framework, encouraging management to be proactive, and warning to be careful. As it develops, risk management is divided into several things: operational risk, hazard risk, financial risk and strategic risk (Selsabila & Rini Lestari, 2022). There are several components and processes in risk management; according to COSO (Committee of Sponsoring Organizations of the Treadway Commission), these components are Internal Environment Target Determination (Objective Setting), Event Identification (Event Identification), Risk Assessment (Risk Assessment); Risk Response (Risk Response); Control Activities (Control Activities); Information and Communication (Information and Communication); Monitoring (Fajar & Rusmana, 2018).

Sharia Capital Market

The history of the Sharia Capital Market in Indonesia began with the issuance of Sharia Mutual Funds by P.T. Danareksa Investment Management on July 3 1997. Furthermore, the Indonesian Stock Exchange (formerly the Jakarta Stock Exchange) collaborated with P.T. Danareksa Investment Management. It launched the Jakarta Islamic Index on July 3, 2000, which aims to guide investors who wish to invest their funds in a sharia manner. With the presence of this index, investors have been provided with stocks that can be used to support following Sharia principles (Lubis, 2008).

On April 18, 2001, for the first time, the National Sharia Council of the Indonesian Ulema Council (DSN-MUI) issued a fatwa directly related to the capital market, namely Fatwa Number 20/DSN-MUI/IV/2001 concerning Investment Implementation Guidelines for Sharia Mutual Funds. Furthermore, Sharia investment instruments in the capital market continued to grow with the presence of P.T. Indosat Tbk in early September 2002 (Yuwono, 2022) behavioral and demographic variables. Examination of the various utility-maximization and behavioral variables underlying individual investor behavior provides a more comprehensive understanding of the investment decision process. This research will examine the seven factors that considered investors' decisions to invest, and investor behavior in taking the decision to invest. The data used are primary data that obtained by sending questionnaires through via email at Danareksa investors domiciled in Salatiga and Semarang. The analysis method used is tabulation frequencies and cross tabulation (Crosstab. This instrument is the first Sharia Bond, and the contract used is the mudharabah contract. The history of the Sharia Capital Market can also be traced from the institutional developments involved in regulating the Sharia Capital Market.

This development began with an MoU between Bapepam and DSN-MUI on March 14, 2003. The MoU indicates an agreement between Bapepam and DSN-MUI to develop a Sharia-based capital market in Indonesia. From the institutional side of Bapepam-LK, the development of the Islamic Capital Market was marked by the formation of the Islamic Capital Market Development Team in 2003. Furthermore, in 2004, the growth of the Islamic Capital Market was included in the organisational structure of Bapepam and L.K. It was carried out by echelon IV level units that specifically have the duty and function of developing the Islamic capital market (Nurhalimah, 2017).

In line with industrial developments in 2006, the existing echelon IV units were upgraded to echelon III level units. On November 23 2006, Bapepam-LK issued a package of Bapepam and L.K. regulations related to the Sharia Capital Market. The rules package is Bapepam and L.K. Regulation Number IX.A13 concerning Sharia Securities Issuance and Number IX.A.14 concerning Contracts used in issuing Islamic Securities in the Capital Market. Subsequently, on August 31 2007, Bapepam-LK issued Bapepam and L.K. Regulation Number II.K.1

concerning Criteria and Issuance of Sharia Securities Lists and was followed by the launch of the Sharia Securities List for the first time by Bapepam and L.K. on September 12 2007.

The development of the Sharia Capital Market reached a new milestone with the enactment of Law Number 19 of 2008 concerning State Sharia Securities (SBSN) on May 7 2008. This law is needed as a legal basis for issuing state sharia securities or Sukuk. On August 26 2008, for the first time, the Indonesian Government issued SBSN series IFR0001 and IFR0002. On June 30 2009, Bapepam-LK made improvements to Bapepam-LK Regulation Number IX.A.13 concerning Sharia Securities Issuance and II.K.1 concerning Criteria and Issuance of Sharia Securities List (Nurbiyanto & Pribadi, 2020).

The capital market is one of the essential elements and a benchmark for a country's economic progress. One of the characteristics of advanced industrial countries and newly industrialised countries is the existence of a well-developed and growing capital market. The announcement of a bond issuance is exciting information for investors (good news) because it is perceived that the company's prospects are good. The distribution of bonds indicates that the company will expand, which will improve the company's performance.

Investors will respond to information regarding the announcement of the issuance of sharia bonds. If investors utilise this information in making investment decisions, the notification will impact changes in share prices and trading volume activity. This is proven by the large influence of Sharia bond issuance on the capital market reaction, namely 11.8%, while the other 88.2% is influenced by other factors not measured in the research (Savitri, 2015).

The capital market is a market for various long-term financial instruments that can be traded in debt and equity. The financial instruments traded on the capital market include stocks, bonds, warrants, rights, convertible bonds and various derivative products such as options (put or call) (Jayengsari et al., 2021) Seriousness, dan Growth (USG). The existence of the capital market is a reality and a recent phenomenon during the life of Muslims in this modern era. From a Sharia perspective, the capital market is a means or product of muamalah. According to Sharia law principles, transactions in the capital market are not prohibited as long as no transactions conflict with the provisions outlined by Sharia (Fauzan & Suhendro, 2018), including transactions containing interest and usury.

Sharia also prohibits transactions in which there is speculation and contains fraud or ambiguity, namely transactions in which fraud is possible (Najamuddin, 2014). Sharia products in the capital market include securities or securities. Based on Law Number 8 of 1995 concerning Capital Markets (UUPM), Securities are securities, namely debt recognition letters, commercial securities, shares, bonds, proof of debt, Participation Units in collective investment contracts, futures contracts on Securities, and any derivatives of Securities (Basya, 2020). In line with this definition, sharia products in the form of securities must not conflict with sharia principles. Therefore, these securities are said to be Sharia Securities.

Bapepam and L.K. Regulation Number IX.A.13 concerning Issuance of Sharia Securities states that Sharia Securities are Securities referred to in capital market regulations and their implementing regulations whose contracts, methods and business activities as the basis for their implementation do not conflict with Sharia principles in the Market. Capital. Until now, Sharia Securities issued on the Indonesian capital market include Sharia Shares, Sukuk and Participation Units from Islamic Mutual Funds.

Fiqh Muamalah

The public often understands Fiqh as Islamic law; with such an understanding, it is not blamed, but it can be broadly explained because not all Islamic law concerns Fiqh alone. Fiqh only informs that Islamic law can be obtained from the process of ijtihad. In contrast, Islamic law is obtained from obvious and definite instructions (qath'i) called Sharia from the Koran or Hadith. The following explanation is given according to language and terms for a broader understanding of Fiqh.

The word Fiqh means al-fahm or understanding. Thus, Jurisprudence, according to the notion of language, involves understanding obtained through a deep thought process, not just knowing or understanding. Not all thinking processes are understanding because understanding is a higher level of thinking than just learning. So Fiqh is the result of deep reflection and reasoning. Thus, it can be concluded that Fiqh is amaliyah through ijihad from the detailed arguments of the Al-Quran and Sunnah (Fadholi, 2020).

Jurisprudence is Zanni in nature, prejudice based on argumentation. Another term related to Fiqh is Sharia terms or conditions. The term sharia has various meanings: a. The teachings brought by the Prophet Muhammad SAW (Sharia in the broadest sense). b. All laws originating from the Al-Quran and Sunnah are both qath'i and dzanni, which regulate the final actions of humans. c. Islamic law is obtained from the proposition of qath'i or (Sharia in the narrow sense). In discussing the relationship between Fiqh and Sharia, the third definition of Sharia is usually used. However, in daily use, the second meaning of Shari'a is often used in society (Rusdan, 2022).

Muamalah comes from the Arabic word al-aml, a general word for all the actions the mukallaf wants. This word describes an activity carried out by someone with someone or several people to meet their respective needs (Zaki, 2021). Meanwhile, Muamalah Fiqh is terminologically defined as laws relating to human legal actions worldwide, for example, in individuals buying and selling debts and receivables, trade cooperation, associations, land cultivation cooperation, and leasing (Iskandar & Aqbar, 2019) analyze the epistemological problems that appear from the existence of Islamic economics between the effect of the economics and fikih muamalah, and give solutions of its epistemological problems especially in higher education institution environment. This research use descriptive-qualitative approach method with content analysis dan library research technique. The results show that : (1. Muamalah is a relationship between humans to obtain physical necessities in the best way possible following religious teachings and guidance (Jamaluddin, 2017).

Islam provides norms and ethics that are reasonable in seeking wealth to provide opportunities for the development of human life in the field of muamalah in the future. Islam also guides so that this development does not cause limitations for one party and unnecessary freedom for the other party (Jamaluddin, 2017). Meanwhile, muamalah law is the law that regulates rights and obligations in society to achieve Islamic law, including accounts payable, leasing, buying and selling and others. In other words, this muamalah problem is managed as well as possible so that humans can meet their needs without causing harm (loss) to others.

Contract in muamalah, one essential thing in running a business is the contract (agreement) issue. Akad is a way to obtain wealth in Islamic law and is widely used daily. Akad is a method that pleases Allah, and its contents must be upheld. Q.S. Al-Maidah (5) verse 1 states: "O you who believe, fulfil the contracts". The word contract comes from the Arabic al-aqdu in the plural called al-uquud, which means a tie or rope knot (Rahayu & Hasbi, 2022).

According to fiqh scholars, the word contract is defined as a relationship between consent and acceptance following the will of the Shari'a, which determines the existence of legal influences (consequences) in the object of the agreement. The formulation of the contract above indicates that the agreement must be between both parties to bind themselves regarding the actions to be carried out in a specific matter (Nur Khusna et al., 2021). This contract is realised first in Ijab and Kabul. Second, by the wishes of the Shari'a. Third, there are legal consequences for the object of the engagement. Contracts (bonds, decisions, or reinforcements), agreements, and transactions can be interpreted as partnerships framed by Sharia values.

In terms of Fiqh, in general, a contract means something that is a person's Determination or goal to carry out, whether it arises from one party, such as endowments, talak, oaths, or arises from two parties, such as buying and selling, wakalah, and pawning. Specifically, a contract means equality between Ijab (statement of offer or transfer of ownership) and Kabul (notification of acceptance of request) within the scope of what is prescribed and affects something (Zuhdi, 2017).

According to the Compilation of Sharia Economic Law, a contract is an agreement between two or more parties to carry out or not carry out specific legal acts. The first source of Muamalah Fiqh law is the Al-Quran. Al-Quran is a form of masdar Qur'an, which means reading. In terms of meaning, the term Qur'an means the term maf'ul from the verb to read. The position of the Al-Quran as a source of law is the word of Allah (revelation) conveyed by the Prophet Muhammad through the angel Gabriel in Mutawatir, and for those who read, study and practice the Al-Quran, it is part of worship. Many verses in the Koran explain muamalah (sharia business), such as buying and selling (Q.S. al-Baqarah: 282), commerce and commerce (Q.S. Quraaisy: 2).

The second source of Muamalah Fiqh law is the Hadith. Hadith, namely everything narrated from the Prophet Muhammad in words, deeds and provisions after he was appointed as a Prophet. Some scholars use the Sunnah as a source of Islamic law. In terminology, Sunnah is everything that comes from the Messenger of Allah, whether in words, deeds, decrees, human nature, morals or his life's journey, whether this happened when he was not yet an Apostle or after he became an Apostle. Hadith is a source of law because what the Prophet SAW did followed the guidance of revelation, not lust (Q.S. al-Ahqaf 46).

Prohibition of buying and selling gharar, namely the Hadith of Muslim History from Abu Hurairah: The Messenger of Allah, prohibited the sale and purchase of pebbles and the sale and purchase of gharar (Najamuddin, 2014). The third source of Muamalah Fiqh is ijhtihad. Ijhtihad means directing all abilities to the maximum, both in implementing Sharia law and in implementing it. To obtain actual muamalah legal provisions in line with the progress of the times and the needs of society, new thinking is needed, which often meets the community's needs, called ijhtihad. This ijhtihad plays a vital role in developing Islamic Fiqh, especially in the field of muamalah.

According to the definition of ijhtihad above, ijhtihad is divided into two parts, namely ijhtihad ostinati (in the Indonesian context, such as ijhtihad issued by the National Sharia Council, which takes the form of a Fatwa) and ijhtihad tatbhiqi (application of the law), such as the preparation of Islamic law in the form of legislation. And the application of Sharia business law in the form of Sharia Banking and Non-Bank Sharia financial institutions. These two types of ijhtihad are used when the Al-Quran and Hadith do not regulate in detail (detailed).

RESULTS AND DISCUSSION

Strengthening the Health of the Sharia Capital Market

The application of sharia principles in the capital market is based on the Koran as the highest source of law and the Hadith of the Prophet Muhammad SAW. Furthermore, the ulama carries out interpretations called fiqh science from these two sources of law. One of the discussions in jurisprudence is the discussion of muamalah, namely, the relationship between human beings related to commerce. Based on this, Sharia capital market activities were developed based on muamalah Fiqh. There is a rule of muamalah Fiqh, which states that all forms of muamalah are permissible unless an argument forbids it (Fad, 2021). This concept is the principle of the Islamic capital market in Indonesia.

As part of the Indonesian capital market system, activities in the capital market that apply sharia principles also refer to Law Number 8 of 1995 concerning Capital Markets and their implementing regulations (Bapepam-LK Regulations, Government Regulations, Stock Exchange Regulations and others). Bapepam-LK, as the capital market regulator in Indonesia, has several specific regulations related to the Islamic capital market, as follows: Regulation Number II.K.1 concerning Criteria and Issuance of Sharia Securities Lists; Regulation Number IX.A.13 concerning Sharia Securities Issuance; Regulation Number IX.A.14 concerning contracts used in Sharia Securities Issuance.

Investors receive income in the form of dividends, which is permissible in Islam. However, many investments on the stock exchange have a fixed interest rate determined in advance, so Islam does not permit such investments. Speculators, the Sharia view regarding the legality of speculator behaviour, namely: speculation that is not legal according to Sharia, namely,

speculators can manipulate stock prices prevailing in the Market, which is rampant in stock exchange operations (Rizki et al., 2022), then engineering changes in the share price is not allowed. Because this condition, in turn, will develop into gambling.

Sharia products in the capital market include securities or securities. Based on Law Number 8 of 1995 concerning Capital Markets (UUPM), Securities are securities: debt acknowledgements, commercial papers, stocks, bonds, proof of debt, Participation Units of collective investment contracts, futures contracts on Securities, and any securities derivatives. Until now, Sharia Securities issued on the Indonesian capital market include Sharia Shares, Sukuk and Participation Units from Islamic Mutual Funds. Sharia shares are conceptually securities as evidence of equity participation in the company. With proof of this participation, the shareholder is entitled to get a share of the proceeds from the company's business (Rosdaniah & Aziz, 2022).

The concept of capital participation with the right to share in business results is a concept that does not conflict with Sharia principles. Sharia principles recognise this concept as *musyarakah* or *syirkah* activities. Based on this analogy, conceptually, shares are securities that do not conflict with Sharia principles (Fajri Ali, 2021). However, not all shares issued by Issuers and Public Companies can be called sharia shares. Sukuk is a new term to replace Islamic bonds (Amertha & Anwar, 2022).

Sukuk in terminology is the plural form of the word "sakk" in Arabic, which means certificate or proof of ownership. Meanwhile, Bapepam and L.K. Regulation Number IX.A.13 provides the following definition of Sukuk: "Sharia securities in the form of certificates or proof of ownership that are of equal value and represent an unspecified portion (*syuyu'*/undivided share) (Cahyono et al., 2022).

As one of the Sharia securities, sukuk has different characteristics from bonds. Sukuk are not debt securities but proof of joint ownership of an asset/project. Every sukuk issued must have an asset used as the basis for the issuance (underlying asset). Ownership claims on sukuk are based on the specific asset/project. The use of Sukuk funds must be used for halal business activities. Rewards for sukuk holders can be in the form of compensation, profit sharing, or margin, according to the type of contract used in the Sukuk issuance (Aminy & Hurriati, 2018).

Types of sukuk based on AAOIFI Sharia Standard No. 17 concerning Investment Sukuk, consisting of Certificates of ownership in leased assets; Certificates of ownership of benefits, which are divided into 4 (four) types: Certificates of ownership of benefits of existing assets, Certificates of ownership of benefits of assets in the future, certificates of ownership of services of certain parties and Certificates of ownership of future services; Greeting certificate; *Istishna* certificate; *Murabaha* certificate; *Musyarakah* certificate; *muzara'a* certificate; *musaqa* certificate; *Mugharasa* certificate (Raksawati et al., 2022).

Bapepam and L.K. Regulation Number IX.A.13 Sharia Mutual Funds are defined as mutual funds as intended in the UUPM and its implementing regulations whose management does not conflict with Sharia Principles in the Capital Market. Sharia Mutual Funds, like mutual funds in general, are an alternative investment for the investing community, especially small investors and investors who do not have much time and expertise to calculate the risks of their investments. Mutual Funds are designed to collect funds from people who have capital and desire to invest but only have limited time and knowledge.

Sharia Mutual Funds were first recognised in Indonesia in 1997 and marked by the Danareksa Shares Sharia Mutual Fund issuance in July 1997. As an investment instrument, Syariah Mutual Funds have different criteria from conventional mutual funds (Sepdiana, 2019). This difference lies in the choice of investment instruments and mechanisms that must not conflict with Sharia principles. Another difference is the overall portfolio management process, screening and cleansing. As with other investment vehicles, besides bringing various profit opportunities, Mutual Funds also contain various risk opportunities, including Risk of Diminishing Participation Unit Value, Liquidity Risk, Default Risk, and Political and economic risks.

The capital market is where companies seek funds to finance their business activities. In addition, the capital market is also an effort to collect public funds directly by investing funds in healthy

and well-managed companies. The main function of the capital market is as a means of capital formation and accumulation of funds for financing a company/emiten (Rizki et al., 2022). The presence of capital market institutions in Indonesia adds to the list of alternatives for people who have excess funds and are interested in investing their funds.

The capital market benefits investors and the business world in general. The capital market is a source of long-term funds, investment alternatives, a vehicle for restructuring corporate capital, and a medium for divestment. The benefit of the capital market for investors is that it provides opportunities or rights for the public to own companies that are healthy, have good prospects in the future, and are alternative investments that provide potential profits with calculated risks. (Rosdaniah & Azis, 2022).

Meanwhile, the benefits of the capital market for the business world are fostering a climate of openness for the business world as well as providing access to social control for companies in running their business, encouraging the use of professional management in managing companies, a vehicle for investing in the short term (liquidity) and long term (growth) and is a source of long-term financing for the company. There are two objectives of investors in investing in the capital market: dividends and capital gains (Cahyono et al., 2022).

Both must be greater or equal to the expected income level. An efficient capital market condition is needed for the prices of shares listed on the capital market to show their true value. However, risk will always exist in every investment because investors must project how much cash flow or income they will receive over the life of the investment. The expected revenue estimation is not necessarily the same as the reality because certain factors influence it.

If certain factors can be predicted in advance, they are considered risky. However, uncertainty is called uncertainty if the conditions cannot be predicted in advance. The Importance of Investment Decisions Before discussing investment decisions, it is necessary to state the meaning of the concept of investment itself (Hadi, 2012). Fatihudin (2005) says that investment is the investment of funds by a company into an asset (assets) with the hope of obtaining income in the future.

Judging from the time, investment is divided into 3 types: short-term, medium-term, and long-term. Meanwhile, looking at the type of asset, investment is divided into investment in real assets and investment in non-real assets (financial assets). Real asset investments include land, buildings, machinery and equipment. Investments in non-real assets include investments in securities (Rahmarisa, 2019).

According to Ardatiya et al. (2022), the investment decision has a long-term time dimension, so the decisions taken must be considered properly because they also have long-term consequences. This investment decision is often referred to as capital budgeting, namely the entire process of planning and making decisions regarding the expenditure of funds whose return period exceeds one year or is long-term. An efficient capital market is a form of Market consisting of many sellers and buyers who interact with each other in it and has a free market character, where it is quite easy for new investors to enter and conduct transactions and vice versa; it is also quite easy. For others to leave the Market at any time.

Several other additional aspects which are the main requirements for forming an efficient capital market are Availability and dissemination of information; Share prices fluctuate freely; There are many investment analysts in the capital market. In the Capital Market, investment risk prediction is quite complex (Sujana, 2017). In principle, the risk of investing in the capital market is solely related to the possibility of price volatility. According to Fadilah and Jalaludin (2019), the risks the investor may face include purchasing power, business risk, interest rate risk, market risk, liquidity and risk.

Efforts to strengthen the health of the Sharia-based Islamic capital market in Indonesia

Risk is unavoidable, and in general, risks arise from three possibilities (Brigham & Houston, 2018) recessively inherited cartilage-hair hypoplasia (CHH, namely: The amount of investment,

Reinvestment from cash flow, Deviations from cash flow and the scope of risk management related to the Bank's obligation to implement risk management effectively (Supriyanto et al., 2022).

Active supervision of directors and sharia board

The Sharia Supervisory Board is a body tasked with supervising the implementation of DSN decisions in Sharia financial institutions. DPS is appointed and dismissed at Sharia financial institutions through the GMS after receiving a recommendation from the DSN. The Sharia Supervisory Board, better known as the DPS, is an existing body in Islamic financial institutions and is tasked with overseeing the implementation of the decisions of the National Sharia Council in Islamic financial institutions. The Sharia Supervisory Board (DPS) is part of the mandatory organisational structure for non-bank financial institutions that use Sharia principles (Wahyu & Anwar, 2020).

There is DSN authority over DPS in 1) Providing or revoking DPS membership recommendations at a Sharia financial institution 2) Issuing fatwas that bind each DPS in each institution and become the basis for legal action by related parties (Darsono, 2022). Supervision by an authorised body is supervision carried out based on a valid statutory regulation, which is based on the existing theory that supervision is carried out by a body that is above it so that there is no contract of authority between two or more supervisory bodies and the body being supervised where the body those who supervise have a higher position than those who are supervised (Anggadini, 2015).

Etymologically, sharia supervision (lughowi) can mean riqabah or guarding, maintenance and monitoring. The Sharia supervisory board is an independent institution or special judge in fiqh muamalat (Fiqh Al-Muamalat). However, DPS can also include members outside of fiqh experts and experts in the field who are obliged to direct, review and supervise the activities of financial institutions so that they can be assured that they comply with the principles of Islamic Sharia. (Wahyu & Anwar, 2020).

This Sharia Supervisory Board is located under the General Meeting of Sharia Supervisors or equal to the Board of Commissioners in the structure of a Sharia Bank or Islamic financial institution. The Sharia Supervisory Board's main task is to oversee Islamic financial institutions' business activities to comply with the provisions and principles of Sharia that the National Sharia Council has issued. The main function of the Sharia Supervisory Board is to act as an adviser and adviser to directors, heads of shari'ah business units and heads of shari'ah branch offices on matters related to shari'ah aspects and as a mediator between Islamic financial institutions and the National Sharia Council in communicating proposals and suggestions for the development of products and services from Islamic financial institutions that require review and fatwas from the National Sharia Council (Prastyaningsih., et al., 2018). For example, Islamic banking or Islamic financial institutions. Sharia supervision carried out by an authorised body or institution has a purpose.

Sharia supervision carried out by an authorised body or institution aims to determine how far the business activities are in the organisation's work unit and to ensure that all financial activities and the Determination of organisational strategies and objectives do not conflict with Sharia principles. Based on the definitions above, it can be concluded that the Sharia Supervisory Board is an independent board of institutions that supervises Sharia principles in the business activities of Islamic banks and non-bank Islamic financial institutions (Desky & Mubarrak, 2022) an analysis effort on community decisions is needed. This study analyzes the factors influencing people's decisions through perceptions, motivation, and learning. This research will use the consumer decision-making process model then replication by entering the knowledge variable as a substitute for learning in the model. This research is a type of survey research using a purposive sampling technique with 160 respondents. For data analysis techniques, the Structural Equation Modeling (SEM).

The existence of a national Sharia board (DSN) and a Sharia supervisory board (DPS) guaranteed by Law No. 10 of 1998 concerning amendments to Law No. 7 of 1992 concerning banking still needs to be completed with implementation instructions (JUKLAK)

and technical instructions (JUKNIS). This is important so that the members of the Sharia supervisory board placed in Islamic financial institutions can work more effectively and efficiently so that the company's running is purely in accordance with Sharia principles.

All Bank Indonesia Regulations (PBI) require that every Sharia Bank must have a Sharia Supervisory Board (DPS). Law No. 21 of 2008 Article 32 (Simal, 2019) mention and explain:

1. A Sharia Supervisory Board must be formed in Sharia Banks and Conventional Commercial Banks that have UUS.
2. The Sharia Supervisory Board, referred to in paragraph (1), is appointed by the General Meeting of Shareholders on the recommendation of the Indonesian Ulema Council.
3. The Sharia Supervisory Board, as referred to in paragraph (1), has the task of providing advice and suggestions to the directors and supervising the Bank's activities so that they comply with Sharia Principles
4. Further provisions regarding the formation of the Sharia Supervisory Board, as referred to in paragraph (1), are regulated by Bank Indonesia Regulations.

In implementing the management of Sharia financial institutions, the Board of Directors, Board of Commissioners and DPS are responsible for the effectiveness of implementing Risk Management in BPRS. For this reason, the Board of Directors, Board of Commissioners and DPS must understand the risks faced by BPRS and provide clear direction, carry out active supervision and mitigation, and develop a Risk Management culture in BPRS. The Board of Directors, Board of Commissioners and DPS must also ensure an adequate organisational structure, determine clear duties and responsibilities for each unit, and ensure adequate quantity and quality of Human Resources (H.R.) to support the effective implementation of Risk Management.

Based on Article 5 POJK MR BPRS, the authority and responsibility of the Board of Directors in the context of supervising the implementation of BPRS risk management includes at least 1) Developing written policies and guidelines for implementing Risk Management; 2) Evaluate and decide on transactions that require approval from the Board of Directors; 3) Developing a Risk Management culture at all levels of the organisation; 4) Ensure increased H.R. competency related to Risk Management; 5) Ensure that the Risk Management function operates independently. In order to carry out authority and responsibility related to supervising the implementation of BPRS Risk Management, the Board of Directors must have an adequate understanding of the risks inherent in all functional activities of the BPRS, including an understanding of Sharia Principles and be able to take the necessary actions following the BPRS Risk profile (Sativa, 2022).

Based on Article 6 POJK MR BPRS, the authority and responsibility of the Board of Commissioners is in the context of supervising the implementation of BPRS risk management (Sukarsih & Nurhayati, 2022), including:

1. Approve and evaluate the Risk Management policy. The Board of Commissioners approves the Risk Management policy prepared by the Board of Directors by considering the Risk Management strategy and framework determined by the level of risk to be taken and the BPRS risk tolerance;
2. Ensure the implementation of Risk Management by the Board of Directors;
3. Evaluate the responsibility of the Board of Directors for implementing Risk Management policies.
4. Evaluate and decide on requests from the Board of Directors relating to transactions that require approval from the Board of Commissioners.

Meanwhile, based on Article 7 POJK MR BPRS, the authority and responsibility of DPS in the context of supervising the implementation of risk management for Sharia financial institutions includes at least 1) Evaluating risk management policies related to compliance with Sharia Principles and 2) Evaluate the responsibility of the Board of Directors for the implementation of risk management policies related to compliance with Sharia Principles, and evaluation of the responsibility of the Board of Directors for the implementation of

Risk Management policies related to compliance with Sharia Principles is carried out by DPS every semester or more. The evaluation results from the Sharia Supervisory Board become input for the Board of Directors in improving the quality of risk management implementation (Simal, 2019).

Monitoring and controlling risks in the use of Information Technology

Information technology is an important element in an Islamic financial institution to survive, compete and gain competitive advantage. Utilisation of information technology provides solutions and benefits for banks in terms of operations, business and financial benefits (Yahya et al., 2020). The use of information technology also helps banks to be able to compete with other banks. However, using information technology, threats or risks can always disrupt a bank's operational performance.

Some of the risks that usually arise when using information technology are virus attacks that can disrupt the performance of information technology. These cracker attacks can disrupt the system and even steal bank confidential data, causing errors and damage to support systems such as broken power lines and so on (Junaedi, 2017). These risks must be managed and anticipated well so they do not cause fatal losses. In dealing with risks or threats, banks hope to find a solution to reduce and overcome risks that often occur to risks that rarely occur in banks.

The use of Information Technology, in addition to increasing the speed and accuracy of transactions and services to customers, also increases risks such as operational, reputational, legal, compliance and strategic risks (Ramadhani, 2021). For this reason, it is expected that the Bank has integrated risk management to identify, measure, monitor and control risks. However, considering that there are differences in market conditions, structure, size and complexity of the Bank's business, there is no one universal risk management system for all Banks, so each Bank must develop a risk management system that follows the risk management function and organisation at the Bank.

Banks are required to have an integrated risk management approach to be able to identify, measure, monitor and control risks effectively. Technology-related risks must be reviewed with other risks that the Bank has to determine the bank's overall risk profile. The risks related to the implementation of Information Technology are the main ones (Kurniati et al., 2021):

- a. **Operational Risk** Operational risk is inherent in every product and service the Bank provides. The use of Information Technology can lead to operational risks caused by, among other things, inadequate/non-conforming design, implementation, maintenance of systems or computers and their equipment, security methods, testing and internal audit standards and the use of other parties' services in the operation of Information Technology.
- b. **Compliance Risk** Compliance risk can arise if the Bank does not have a system that can ensure the Bank's compliance with the provisions that apply to the Bank, such as the confidentiality of customer data. Compliance risk can have a negative impact on the Bank's reputation and image, as well as impact on business opportunities and the possibility of expansion.
- c. **Legal Risk** Banks face legal risks caused by lawsuits, absence of supporting laws and regulations or weaknesses in engagements such as non-compliance with the legal requirements of a contract.
- d. **Reputation Risk** Negative public opinion can arise, among others, due to system failures that support products. These cases exist in Bank products and the Bank's inability to provide customer service support in case of system failure (downtime). This negative opinion can reduce the Bank's ability to maintain customer loyalty and the success of the Bank's products and services.

Strategic Risk This risk arises due to the incompatibility of the Information Technology used by the Bank with the strategic objectives of the Bank and the strategic plans made to

achieve these objectives. This is because the quality of implementation and the resources used by Information Technology are inadequate. These resources include communication channels, operating systems, and delivery networks, as well as the capacity and capability of Information Technology managers. In using technology, Bank management must use a rigorous, thorough, careful and accurate analysis process to identify and quantify risks and implement risk controls. For this reason, the risk assessment carried out by the Bank needs to be carried out continuously with a cycle that includes at least four important steps (Ramadhani, 2021):

- a. Collection of data/documents on activities related to Information Technology that has the potential to create or increase risks from both future and ongoing activities, including but not limited to:
 1. Critical Information Technology Assets in order to identify access points and deviations of confidential customer information;
 2. Results of a review of the business strategic plan, especially a review of potential risk assessments;
 3. Results of due diligence and monitoring of the performance of service providers;
 4. Review results of reports or complaints submitted by customers and/or Information Technology users to the Call Center and/or Help Desk;
 5. Results of Self Assessment carried out by all work units regarding controls carried out related to Information Technology;
 6. Audit findings related to the implementation and use of Information Technology.
- b. Risk analysis relates to the potential impact of each risk, for example, fraud in programming, computer viruses, system failures, natural disasters, errors in selecting the technology used, problems with system development and implementation, and errors in predictions of the Bank's business development.
- c. Determination of control priorities and mitigation measures based on the overall results of the Bank's risk assessment. For this reason, the Bank must create a risk rating based on the probability of an event, the magnitude of the impact that can be caused, and risk mitigation that can be carried out to reduce the risk exposure.
- d. Monitoring control and mitigation activities on risks identified in the previous risk assessment period, including corrective follow-up plans, clarity of accountability and responsibility, reporting systems, and quality control, including compensating control.

Internal control system in Islamic financial institutions

Internal control is a company's procedures and processes to protect assets, process information accurately, and ensure compliance with applicable laws and regulations (Rosdianti, 2019). The Committee on Auditing Procedures of the American Institute of Certified Public Accountants (AICPA) states that internal control includes organisational plans and all methods and actions that have been used within the company to safeguard its assets, check the accuracy and reliability of accounting data, promote operational efficiency, and encourage compliance with policies, which has been set (Jenkins et al., 2020).

Other literature reveals a similar definition, namely, internal control includes the organisational structure and all the methods and regulations the company has established to maintain and secure its assets, check the accuracy and correctness of accounting data, promote work efficiency and encourage compliance—policies set by management (Hartono & Nugroho, 2022). So, internal control can be interpreted as all efforts in the form of a series of regulations/policies carried out by the organisation/company in order to minimise risk by securing all of its assets and ensuring that all lines of the organisation have carried out company operations according to established policies and do not deviate from regulations.

In banking, internal control can be defined as contained in S.E. No. 5/22/DPNP concerning Guidelines for Internal Control System Standards for Commercial Banks. In the circular letter, it is stated that internal control is a supervisory mechanism established by bank management on an ongoing basis in order to safeguard and secure the bank's assets, ensure the availability of more accurate reports, increase compliance with applicable regulations, reduce the financial impact /losses, irregularities including cheating/fraud, and violations

of prudential aspects, as well as increasing organisational effectiveness and increasing cost efficiency (Otoritas Jasa Keuangan, 2017).

In general, the purpose of internal control is to achieve the following things (Japina, 2017): a) Maintaining the security of the company's assets/assets, b) Checking the accuracy and correctness of accounting information, c) Improving the company's operational efficiency, and d) Helping to maintain the established management policies. Meanwhile, internal control carried out by banks has several objectives, including a) Compliance objectives, b) Information purposes, c) Operational objectives, and d) Risk culture objectives.

In order to achieve some of the above objectives, elements that support the implementation of internal control are needed (Ngurawan et al., 2021), among others:

- a. Organizational structure is a framework for the clear separation of responsibilities based on the function and level of the unit being formed. The principle in compiling the organisational structure, namely the separation of each existing function and one function, should not be given full responsibility for carrying out all stages of activities; this aims to create a maximum mutual control mechanism between functions.
- b. Authority system and record-keeping procedures within the organisation. The organisational structure must be equipped with job descriptions that regulate the rights and authorities of each level and its staff. Job descriptions must be supported by procedural instructions in the form of regulations on the implementation of tasks accompanied by an explanation of the parties authorised to authorise activities; then, related to recording must also be accompanied by standard procedures. Standard recording procedures guarantee the accuracy and reliability of data within the company. Transactions occur if an authorised official has authorised them and, each document has valid evidence, there is an initial and signature of an authorised official.
- c. Implementation of work in a healthy manner The procedure for working healthily is an implementation that is made in such a way as to support the achievement of internal control objectives, which are shown in several ways. It is important to maintain the prudent element so that no one handles transactions from start to finish alone, must rotate between employees, carry out various tasks that have been assigned, check for deficiencies in implementation, and prevent fraud.
- d. Quality employees One of the main elements driving an organisation is employees. Employees must be qualified so that the organisation has a quality image. In general, employee quality is determined by three aspects, namely education, experience and morals. Not only quality but the suitability of responsibilities and division of tasks need to be considered. Qualified employees can be determined based on the recruitment process carried out for them, whether on a professional basis or based on charity (closeness of friends).

The internal control structure includes five basic elements of policies and procedures designed and used by management to ensure control objectives can be met reasonably. The five (Hartono & Nugroho, 2022) include a) Control environment; b) The control environment concerns actions; c) policies and procedures that reflect the overall attitude of management; d) board of commissioners, owners; and e) other parties regarding the importance of internal control for the entity.

The factors that make up the control environment (Jenkins et al., 2020) include:

- a. Integrity and ethical values. It is a product of the entity's ethical and behavioural standards and how they are communicated and implemented in practice.
- b. Commitment to competence. It is the knowledge, expertise, and skills used to complete the work assigned to individuals.
- c. Participation of the board of commissioners and audit committee. An effective board of commissioners is independent of management, and its members actively assess management activities.

In the internal control system, there is someone whose job is to oversee the running of the internal control system. Namely, what is said by Internal Audit is someone who oversees the

internal analysis of a bank so that internal control can run well and according to regulations. It is impossible for the leader of a bank to carry out all operational activities, so he cannot do it alone in supervising employees and their assets. So, an internal auditor must supervise the operation so that it runs effectively.

Bank Indonesia, through Bank Indonesia Regulation No. 1/6/PBI/1999 concerning the assignment of the Director of Compliance (Compliance Director) and the application of Standards for Implementation of Internal Audit Functions for Commercial Banks, states that in order to safeguard and secure bank business activities, it is necessary to implement an effective bank internal audit function. The Standard for Implementing the Bank's Internal Audit Function (SPFAIB) is used in internal audits. Based on the SPFAIB, banks are required to draw up an Internal Audit Charter, form an Internal Audit Work Unit (SKAI) and develop internal audit guidelines, SKAI's duties and responsibilities (Harjanti & Mona, 2020) are:

- a. Assist the main director and board of commissioners in carrying out supervision by explaining operationally the planning, implementation and monitoring of audit results;
- b. Assisting with analysis and assessment in the fields of finance, accounting, operations and other activities through direct inspection and direct supervision;
- c. Identify all possibilities to improve and increase the efficiency of the use of resources and funds;
- d. Provide suggestions for improvement and objective information about the activities examined at all levels of management.

CONCLUSION

Based on the previous explanation, it can be concluded from this study as follows:

1. In the framework of strengthening the health of the Sharia capital market, it is closely related to efforts to address the risks that will occur in the Sharia capital market. The risks that occur in the capital market are quite complex. In principle, investment risk in the capital market is solely related to the possibility of price volatility and the risks that investors may face, including purchasing power risk, business risk (business risk), interest rate risk, market risk (market risk); Liquidity risk (liquidity risk).
2. Efforts to strengthen the health of the Sharia-based Sharia capital market in Indonesia are carried out through three practical steps: active supervision of Sharia directors and boards, monitoring and controlling the risk of using Information Technology, and an integrated internal control system at each stage.

Recommendations and suggestions

1. We recommend that the Financial Services Authority (OJK) publish the ranking of each indicator on the risk approach factor and the procedure for obtaining a composite rating of the soundness level of a bank after obtaining a rating for each risk approach factor.
2. Researchers suggest rating agencies that give awards to banks include risk indicators and good corporate governance as variables for determining banks' ratings, especially Islamic banking.

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AN ANALYSIS OF THE CASES OF SOVEREIGNTY OVER PULAU LIGITAN AND PULAU SIPADAN (BETWEEN INDONESIA AND MALAYSIA) AND PEDRA BRANCA (BETWEEN MALAYSIA AND SINGAPORE): WHY MALAYSIA SUCCEED IN CLAIMING PULAU LIGITAN AND PULAU SIPADAN BUT FAILED IN PEDRA BRANCA?

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ABSTRACT

This study addresses the Pulau Ligitan and Pulau Sipadan disputes between Malaysia and Indonesia and the debate over Pedra Branca (Pulau Batu Puteh) between Malaysia and Singapore. In both confrontations, diplomatic and negotiating efforts to settle fell short. Both parties submitted The cases to the International Court of Justice (ICJ). The International Court of Justice ruled in 2002 that Pulau Ligitan, Pulau Sipadan, and Pedra Branca belonged to Malaysia and Singapore, respectively. This paper aims to explain why Pulau Ligitan and Pulau Sipadan belong to Malaysia, whereas Pedra Branca is a part of Singapore. What is the primary problem that the ICJ ruling affected and took into account? This study used secondary sources such as books, journals, and ICJ Reports. This study concludes that "effective occupation" was significant in the ICJ's ruling. The ICJ ruling was influenced by Malaysia's effective occupancy of Pulau Ligitan and Pulau Sipadan, even though Indonesia and the Netherlands claimed both islands following the 1891 Convention. Similar to Pedra Branca, which is near Malaysia and was historically a part of Malaysia (Sultanate of Johore), Pedra Branca is also greatly influenced by Singapore's "effective occupation" of the islet.

Keywords: Pulau Sipadan, Pulau Ligitan, Pedra Branca, International Court of Justice, effective occupation,

INTRODUCTION

A peaceful way was used to resolve the disputes between Indonesia and Malaysia over Pulau Sipadan and Pulau Ligitan and the conflict between Malaysia and Singapore over Pulau Batu Puteh/Pedra Branca. Malaysia-Indonesia and Malaysia-Singapore's dispute resolution procedures are by Article 1 (1), Article 2(3), Article 33(1), Article 33(2), and Article 34 of the United Nations Charter.

Article 1(1) of the Charter of the United Nations states that;

"To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace and the suppression of acts of aggression or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace."¹

¹ Article 1 (1) stated clearly the purpose and principles of the United Nations Organisation.

In Article 2(3), the Charter stated that,
 "All members shall settle their international disputes by peaceful means so that international peace and security, and justice, are not endangered."²

The obligation is fortified by Article 33 (1), which regulates the pacific settlement of international disputes and compels members to settle disputes in the following terms: Article 33(1) stated that,

"The parties to any dispute, the continuance of which is likely to endanger the maintenance of international peace and security, shall, first of all, seek a solution by negotiation,³ enquiry,⁴ mediation,⁵ conciliation,⁶ arbitration,⁷ judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice."⁸

Article 34 of the Charter states that,

"The Security Council may investigate any dispute or any situation which might lead to international friction or give rise to a dispute to determine whether the continuance of the dispute or situation is likely to endanger the maintenance of international peace and security."⁹

As stated in Article 33 (1), Indonesia, Malaysia, and Singapore committed to take their problems before the International Court of Justice (ICJ) in The Hague, the Netherlands, if negotiations and diplomatic means were unsuccessful in resolving them.

This article is divided into five sections: an introduction, a background of the dispute and the negotiation settlement stage before the ICJ; a principal discussion of the cases involving Pulau Sipadan and Pulau Ligitan (Indonesia v. Malaysia) and Pulau Batu Puteh/Pedra Branca (Malaysia v. Singapore); and a discussion of the reasons why Pulau Sipadan and Pulau Ligitan belong to Malaysia and Pulau Batu Puteh/Pedra Branca belong to Singapore with emphasised to the influential occupation factors and; finally a conclusion.

2.0 Objective of Study

This study has three main objectives: -

1. The first objective of this study is to examine the disputes between Malaysia, Singapore, Indonesia, and Malaysia over Pedra Branca and the islands of Pulau Sipadan and Pulau Ligitan.
2. To investigate why Pedra Branca (2008) belongs to Singapore and Pulau Sipadan Pulau Ligitan (2002) belongs to Malaysia.
3. To evaluate the significance of a practical occupation in an ICJ judgement.

² Article 2(3) of the Charter of the United Nations Organisation.

³ Negotiations are discussion held directly between the contending parties with a view to finding a solution through dialogue without requiring reference to third parties. Political considerations, rather than legal arguments, permeate such discussions, but legal arguments are often adduced to support the negotiating of the parties.

⁴ Contending states may, on occasion, agree to appoint an impartial body to carry out an investigation or enquiry into the facts surrounding a matter. The object of such a factual report is to facilitate a negotiated settlement. *The Hague Conventions on the Pacific Settlement of Disputes 1899 and 1907* both contain provisions which expedite the setting up of commission of enquiry. This procedure does not involve the making of specific recommendations for the settlement of the problem.

⁵ Mediation involves a greater degree of third-party participation than good office, but essentially is an attempt to bring the parties together and to suggest and, subsequently communicate, alternative proposals for the solution of the dispute and to attempt to reconcile the positions of the parties. Suggestions of mediators do not have a binding effect.

⁶ Conciliation involves the participation of impartial or neutral third parties in the formulation of proposal for the resolution of international disputes. This procedure often requires an attempt to reconcile the views of the contending parties although again the proposals of conciliators have no binding effect in law. *The Hague Conventions for the Pacific Settlement of International Disputes 1899 and 1907* contain mechanisms and rules for the creation of conciliation commissions.

⁷ Arbitration has been defined by The International Law Commission as 'a procedure for the settlement of disputes between states by a binding award on the basis of law and as a result of an undertaking voluntarily accepted.'

⁸ Article 33 (1) of the Charter of the United Nations.

⁹ Article 34 is related with the Article 33 (2) stated that "The Security Council shall, when it deems necessary, call upon the parties to settle their dispute by such means." Chapter VI (Pacific Settlement of Disputes) from Article 33 to Article 38 generally mentioned directly and indirectly about peaceful settlement of disputes.

3.0 Background of the Disputes and Negotiation Stage.

3.1 Background of the Disputes and Negotiation Stage between Indonesia and Malaysia:

Two small islands, Pulau Ligitan and Pulau Sipadan, can be found off Sabah, Malaysia, in the Celebes Sea (Laut Sulawesi). Since the late 1960s¹⁰, Indonesia and Malaysia have argued over who has sovereignty over the islands of Pulau Sipadan and Pulau Ligitan. This issue grew more heated in the early 1990s¹¹ after Indonesia learned that Malaysia had developed several tourist attractions and conducted tourism-related operations on Pulau Sipadan. According to Indonesia, Malaysia verbally agreed to explore the issue of island sovereignty in 1969. However, Malaysia refuted the claim that they had an agreement, claiming that Pulau Sipadan and Pulau Ligitan have always been a part of Sabah (Malaysia).

President Suharto¹² and Dr. Mahathir Mohamad¹³ let the conversation on Pulau Sipadan and Pulau Ligitan continue at the ministerial level in September 1994. Official-level discussions and negotiations came to a standstill. Dr Mahathir Mohamad appointed Anwar Ibrahim, and Moerdiono.¹⁴ was chosen by President Suharto for the Indonesian side.

The negotiations were in full swing from the middle of 1995 to the centre of 1996. Moerdiono and Anwar Ibrahim had four meetings. Initial meetings took place in Jakarta, Indonesia, in July 1995, Kuala Lumpur, Malaysia, in September 1995, Jakarta, Indonesia, in October 1995, and Kuala Lumpur, Malaysia, in June 1996. Indonesia's minister and Malaysia's deputy prime minister met at the ministerial level, but no agreement was reached.

In October 1996, President Suharto of Indonesia and Prime Minister Dr Mahathir Mohamad of Malaysia met in Kuala Lumpur. Both leaders agreed that the ICJ should be consulted over the sovereignty of Pulau Ligitan and Pulau Sipadan and Signed a special agreement on Pulau Ligitan and Pulau Sipadan to be referred to the ICJ on May 31, 1997.

3.2 Background of the Dispute and Negotiation Stage between Malaysia and Singapore:

Pulau Batu Puteh, a small island (islet) 25 nautical miles (=46 kilometres) east of Singapore and 7.7 nautical miles (=14.3 kilometres) south of Johore, Malaysia, is known in Portuguese as Pedra Branca, which translates to "White Rock." Middle Rock (Batuan Tengah in Malay), which is 0.6 nautical miles (1.1 kilometres) south of Pulau Batu Puteh, and South Ledge (Tubir Selatan in Malay), which is 2.2 nautical miles (4.1 kilometres) southwest of the Pulau Batu Puteh.¹⁵, are two maritime features close to the Pulau Batu Puteh/Pedra Branca. South Ledge is only visible during low tide.

The Malaysian government produced a map on December 21, 1979, designating Pulau Batu Puteh as Malaysian territory and its waters as Malaysia's territorial sea. The government of Singapore protested the inclusion of Pulau Batu Puteh on the 1979 map in February 1980. Malaysia objects to all of Singapore's construction on Pulau Batu Puteh. From 1980 to 1994, talks of Pulau Batu Puteh were in progress. Hussein Onn¹⁶, Prime Minister of Malaysia, met with Lee Kuan Yew¹⁷, prime minister of Singapore. Dr. Mahathir Mohamad

¹⁰ The regional political situation in the Southeast Asia in the 1960s influenced Malaysia and Indonesia not to raise the delimitation and maritime issues because both countries facing common enemy (communist ideology in Indo-China). Indonesian domestic politics under "new order" (President Suharto) did not so stable after Indonesian Coup 1965. Suharto have had to consolidate his power.

¹¹ Regional and international politics had changed dramatically after the end of the Cold War in 1989. The changes of international political structure from bipolarity structure to unipolarity structure influenced the Southeast Asian regional politics.

¹² The second President of Indonesia, served from 1967 until 1998.

¹³ The fourth prime minister of Malaysia, in office from 1981 until 2003.

¹⁴ Moerdiono, Minister/State Secretary of Indonesia.

¹⁵ The map and geographical location of Pulau Batu Puteh, Middle Rocks and South Ledge (and position of Johore/Malaysia and the Republic of Singapore), see Sketch -map no.2, page 3, International Court of Justice, Sovereignty over Pedra Branca/Pulau Batu Puteh, Middle Rocks and South Ledge (Malaysia/Singapore), Summary of the Judgement of 23 May 2008, p. 3

¹⁶ Hussein Onn was third prime minister of Malaysia, served from 1976 until July 1981.

¹⁷ Lee Kuan Yew was the first prime minister of Singapore.

and Goh Chock Tong.¹⁸ They attended four eye meetings after Hussein Onn. There was no agreement reached during the bargaining process. Ultimately, both parties decided to submit their differences on Pulau Batu Puteh to the ICJ.

4.0 Discussion

4.1 The case of sovereignty over Pulau Ligitan & Pulau Sipadan (Indonesia/Malaysia)

By sixteen votes to one, the International Court of Justice (ICJ) ruled in the matter of sovereignty over Pulau Ligitan and Pulau Sipadan that Malaysia is the rightful sovereignty of the two small islands (Pulau Sipadan and Pulau Ligitan) in the Celebes Sea off the northeastern coast of Borneo.

The 1891 Convention between Great Britain and the Netherlands established the 4 10' North parallel of latitude as the dividing line between the British and the Dutch possessions in the area (Pulau Ligitan & Pulau Sipadan are situated to the south of that parallel), was rejected by the Court after referring to the complex historical background of the dispute between Malaysia and Indonesia. Therefore, under the 1891 Convention, the title to those islands vested in the Netherlands is now granted in Indonesia.

The Court, after referring to the complex historical background of the dispute between Malaysia and Indonesia, rejected Indonesia's claim that her sovereignty over Pulau Ligitan and Pulau Sipadan was based primarily on the 1891 Convention between Great Britain and the Netherlands- that established the 4 10' North parallel of latitude as the dividing line the British and the Dutch possessions in the area (Pulau Ligitan & Pulau Sipadan are situated to the south of that parallel). It follows that under the 1891 Convention title to those islands vested in the Netherlands, it now vests in Indonesia.

The 1891 Convention was examined by the ICJ, which determined that it does not form a title on which Indonesia can base her claim to Pulau Ligitan and Pulau Sipadan when read in context and light of its object and purpose. The ICJ then had to decide whether Indonesia or Malaysia could claim ownership of the disputed islands based on the effectivities they had cited.

After examining the 1891 Convention, the ICJ found that the 1891 Convention, when read in context and light of its object and purpose, does not constitute a title on which Indonesia can find her claim to Pulau Ligitan and Pulau Sipadan. The ICJ then had to consider whether Indonesia or Malaysia could hold title to the disputed islands by the effectiveness they cited.

Regarding this, the Court decided whether the parties' claims to sovereignty were supported by actions demonstrating a genuine, ongoing exercise of activity over the islands, i.e., the intention and will to act as sovereign.

- i. Indonesia emphasised the continuous presence of the Indonesian and Dutch navies in Pulau Ligitan and Pulau Sipadan in this regard.
- ii. She went on to say that Indonesian fishermen had long exploited the surrounding waterways to fish.

Indonesian Arguments

- i. The court held that, about the first arguments, "it cannot be deduced (from the facts) that the Naval authorities concerned considered Pulau Ligitan and Pulau Sipadan and the surrounding waters to be under the sovereign of the Netherlands or Indonesia."
- ii. In response to the second argument, the Court found that "activities by private persons cannot be seen as effective if they do not occur based on official regulations or under government authority.

¹⁸ Goh Chock Tong was second prime minister of Singapore.

Malaysian Arguments

After rejecting Indonesia's claims based on such effectivities, the Court considered Malaysia's effectivity.

Malaysia touted the actions taken by the North Borneo authorities to monitor and control the harvesting of turtle eggs on Pulau Ligitan and Pulau Sipadan—an activity that at the time had significant economic significance in that region—as evidence of her efficient administration of the islands. The Turtle Preservation Ordinance of 1917 was cited by Malaysia, which claimed that it “was applied until the 1950s at least” in the region of the two contested islands (Pulau Ligitan & Pulau Sipadan).¹⁹

It also referred to the fact that in 1962 and 1963, the North Borneo colony's government built lighthouses on Pulau Sipadan and Pulau Ligitan in 1963. Such lighthouses are still in operation and have been looked after by Malaysian officials since independence. The Court recognised that although Malaysia's operations were few, they varied in kind and included legislative, administrative, and quasi-judicial actions. They span a sizable amount of time and exhibit a pattern that indicates a desire to exercise State functions about the two islands as part of the administration of more islands.

The Court stated that “when these activities were carried out, neither Indonesia nor her predecessor, the Netherlands, ever expressed her disagreement or protest.”

Based on the effectivities, the Court concluded that “Sovereignty over Pulau Ligitan and Pulau Sipadan belongs to Malaysia.”²⁰

4.2 The case of dispute/sovereignty over Pedra Branca/Pulau Batu Puteh.

Singapore asserted that the island/islet was terra nullius in the mid-1800s when the United Kingdom (its predecessor) took legal possession of the islet to build a lighthouse (The Horsburgh Lighthouse). In contrast, Malaysia claimed that it has an original title to Pedra Branca/Pulau Batu Puteh (dating back to its predecessor, the Sultanate of Johore) and continues to hold this title.

The Court reasoned that in a letter sent on June 12th, 1953, to the British Advisor to the Sultan of Johore, the Colonial Secretary of Singapore requested information regarding the “colony territorial waters.” The Acting State Secretary of Johore responded in a letter dated September 21, 1953, stating that the “Johore government did not claim ownership” of the island.²¹

The Court considers that this correspondence and its interpretation are of central importance “for determining the developing understanding of the two parties about sovereignty over Pedra Branca—and finds that the Acting State Secretary of Johore's reply shows that as of 1953 Johore understood that it did not have authority over Pedra Branca.

The Court also considered that Singapore's claim could be supported by the actions of the parties, such as Malaysia's lack of response to the flying of the Singapore ensign on the island, Singapore's installation of military communication equipment on the Pedra Branca in 1977, and Singapore's proposed reclamation plans to expand the island. The Court concluded that sovereignty over Pedra Branca belongs to Singapore.²²

¹⁹ International Court of Justice, ‘Case concerning Sovereignty over Pulau Ligitan and Pulau Sipadan (Indonesia/Malaysia), 17 December 2002, General List No. 102, pp.56-58. See also Mohammad Naqib Ishan Jan, 2011, Principles of Public International Law; A Modern Approach, Gombak: IIUM Press, p.106.

²⁰ International Court of Justice, ‘Case concerning Sovereignty over Pulau Ligitan and Pulau Sipadan (Indonesia/Malaysia), 17 December 2002, General List No. 102, p.59.

²¹ International Court of Justice, Sovereignty over Pedra Branca/Pulau Batu Puteh, Middle Rocks and South Ledge (Malaysia/Singapore), Summary of the Judgement of 23 May 2008, p. 9 and also see Mohd. Noor Yazid, 2017, “Hujah Rebut Pedra Branca,” Berita Harian, 8 April 2017, p. 10.

²² International Court of Justice, Sovereignty over Pedra Branca/Pulau Batu Puteh, Middle Rocks and South Ledge (Malaysia/Singapore), Summary of the Judgement of 23 May 2008, pp. 11 & 12

4.3 Analysis/Related Cases with Pulau Sipadan & Pulau Ligitan and the Pulau Batu Puteh/Pedra Branca.

The Court decision over the dispute island between Indonesia-Malaysia (Pulau Sipadan and Pulau Ligitan) and the dispute island/islet between Malaysia-Singapura are similar to the conclusion of the following cases: -

- i. Island of Palmas Arbitration Case (Netherland v. United States of America).
- ii. Clipperton Island Case (France v. Mexico)
- iii. Eastern Greenland Case (Norway v. Denmark)
- iv. Minquiers and Eecrehos Case (France v. United Kingdom)

i. Island of Palmas Arbitration Case (The Netherlands v. United States of America)

In this case, a dispute arose in 1906 between the United States of America and the Netherlands concerning sovereignty over the island of Palmas (an island that lies about 50 miles southeast of Mindanao). The United States contended that she had acquired the island from Spain under the Treaty of Peace between the United States and Spain in 1898 (Treaty of Paris).

The Netherlands, however, considered the island as forming part of the territory of their possessions in the East Indies by contending that the island was never under the occupation of Spain (and as such, Spain had no authority to transfer it to any other state).

The arbitration court decided the dispute in favour of the Netherlands.

The Court said that an effective occupation is necessary for acquiring sovereignty over a particular territory. There should be occupation, and contacts with the territory's inhabitants should be established. As the arbitrators pointed out, work involves two elements: a will to exercise sovereignty and an exhibition of actual authority.

The arbitrators said that "if Spain discovered the island, there was nothing on record to prove that the Spaniards ever went to the island, occupied it and established contacts with the inhabitants of the island." There was also no evidence that the Spaniards had established some administration on the island. On the other hand, the Netherlands had not only based contacts with the island's people but also exercised sovereignty over it since 1700.

Therefore, the Court of Arbitration held that the island of Palmas was a part of the Netherlands, which she had incorporated into her territory through occupation.

CONCLUSION

Effective occupation is one of the significant considerations in determining the Court's decision, according to the discussion above. The international court does not consider the colonial era's historical context and customs. Malaysia is the rightful owner of Pulau Ligitan and Pulau Sipadan due to Malaysia's effective occupation of both islands. Based on the same factor, Singapore's effective and continuous occupation of the Pedra Branca—also belongs to Singapore.

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REGULATING FLEXIBLE WORKING ARRANGEMENTS (FWAS) IN MALAYSIAN PRIVATE SECTOR: HALF A LOAF IS BETTER THAN NONE

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ABSTRACT

Flexible Working Arrangements (FWAs) are common in developed countries, unlike Malaysia. Before the FWAs legislation embedded in the Employment Act 1955, FWAs were not warmly received by the private sector. However, the COVID-19 pandemic proved to employers, employees, and policymakers that FWAs are viable, particularly those working from home (WFH). The government of Malaysia has formally recognised FWAs by adding Part XIIC to the Employment Act 1955 via the Employment (Amendment) Act 2022 (the Amendment Act), which came into effect on 1 January 2023. Therefore, this paper aims to analyse the newly introduced FWA legislation. The question arises as to how comprehensive the new legislation is. Doctrinal legal methodology is deployed in this study. Upon analysing Part XIIC of the Employment Act 1955, it is submitted that the legislation is very brief, which creates lacunae in the law. Thus, this finding advances insight into Malaysia's newly introduced FWAs legislation. It is recommended that Malaysian legislators compare the FWAs legislation practised in other countries, such as the United Kingdom and Australia. In conclusion, it is better to be regulated regardless of how simple the regulations are rather than not having any at all.

Keywords: Flexible Working Arrangements (FWAs), Right to Request, Employment Act 1955, Doctrinal Study.

INTRODUCTION

The rapid development of technology and societal demands has changed the nature of employment. Flexible work arrangements (FWAs) that allow for flexibility in where and when people work are becoming more prevalent in today's workplace. According to Maxwell et al. (2007), FWA is any formal or informal policies and practices that allow individuals to choose the time and location of their employment. FWAs are alternatives to traditional working arrangements, which tend to be more fixed and rigid, such as the traditional "9-to-5" workday, workweek, or workspace. Part-time, term-time, job-sharing, flexitime, compressed hours, annual hours, working remotely frequently, career breaks, commissioned outcomes, zero-hours contracts, and remote work or teleworking are just a few examples of FWAs (Shaari & Amirul, 2020; Hajal, 2022). Even though FWAs are nothing new in the United Kingdom (UK), Europe, the United States, Australia, and New Zealand, they are uncommon in the Malaysian private sector (Tumin, 2020). The government of Malaysia introduced an initiative to encourage FWAs in the private sector in 2014-2015. However, the initiative was met with lukewarm reception (Shaari & Amirul, 2023a). Multinational firms (MNCs) with operations in Malaysia, including Intel, HSBC, Bosch, and Shell, to mention a few, were seen as being more receptive to FWAs. Only a few large homegrown companies, such as Maybank, Sunway Group, and TM Group, welcomed the initiative.

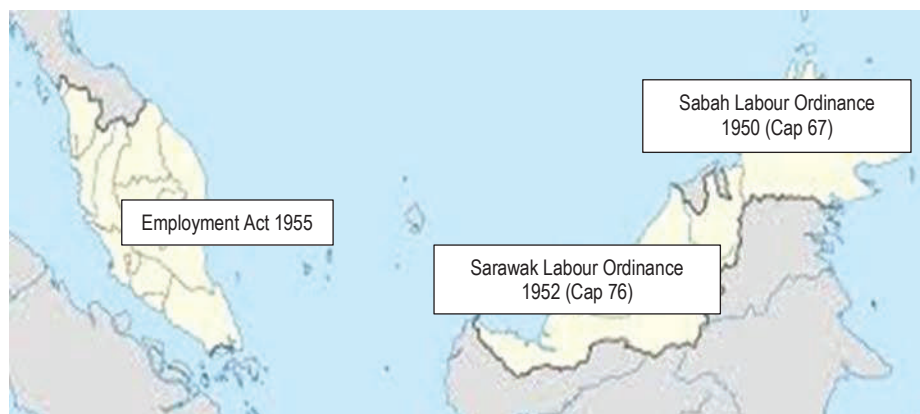
The COVID-19 outbreak has shown the Malaysian government, businesses, and employees that working conditions must be modified to adapt. To contain the widespread COVID-19, the Prevention and Control of Infectious Diseases (Declaration of Infected Local Areas) Order 2020 (PCID Order), known as the Movement Control Order (MCO), was issued on 16 March 2020 by Tan Sri Muhyiddin Yassin, the then-prime minister of Malaysia, following

the Prevention and Control of Infectious Diseases Act 1988 (PCID Act 1988). The first MCO was proclaimed in Government Gazette PU (A) 87 on 17 March 2020, effective 18 March 2020. The MCOs prohibited the opening of workplaces except for manufacturers, suppliers, retailers, and food outlets (Tay et al., 2021). The employers had to resort to working from home (WFH) for the business's survival and to lessen the possibility of layoffs. The Covid-19 pandemic has been an eye-opener to employers, employees, and policymakers. The state of the pandemic crisis has further accelerated the development phase of FWAs in Malaysia, particularly WFH. It has paved the way for incorporating new provisions about FWAs in the recently amended Employment Act 1955 (EA, 1955).

Therefore, this article aims to appraise the newly introduced provisions of the FWAs critically. Before discussing the recently added clauses on FWAs, it is crucial to comprehend Malaysia's employment legislation underpinning terms and conditions of employment. There are three different statutes governing the terms and conditions of employment in Malaysia. First, the EA 1955 applies to employees employed in Peninsular Malaysia. The Sabah Labour Ordinance and Sarawak Labour Ordinance are applicable respectively to the employees who fall under its First Schedule (Shaari & Amirul, 2020).

Figure 1

Employment Law Statutes in Malaysia



The paper is structured in the following manner. First, the concept of FWAs is explored by briefly presenting the definition and the background of FWAs in Malaysia. The next section reviews the literature concerning FWAs, followed by an outline of the methodology employed. Next, the recently introduced legal provisions on FWAs will be analysed. The paper subsequently provides some recommendations to benefit policymakers, employers, and employees, and the final part wraps up a conclusion.

LITERATURE REVIEW

Researchers from various fields have looked at FWAs from diverse angles, such as human resources, management, psychology, health, etc. Chung (2018) considered that employers and employees have heavily relied on FWAs despite the different goals. Employees use FWAs to manage their work schedules, locations, and workloads. On the other hand, employers see the FWAs as a tool to boost organisational productivity, retain employees, and gauge employee engagement, contentment, and motivation. Hajal (2022) submitted that the COVID-19 pandemic has expedited current trends toward greater acceptance of FWAs. Baumann and Marcum (2023) acknowledged the benefits of remote working as part of FWAs. However, they cautioned the workplace decision-makers to know the factors that make remote work advantageous for individuals and employers and fair and complying with laws.

Despite the abundance of FWAs advantages, a recent seminal study by Amirul et al. (2020) pointed out that the flexible working approach for enhancing its advantages has yet to be

adequately documented in the literature of FWA studies, particularly in Malaysia. Amirul and Shaari (2021) performed a systematic scanning and clustering review (SSCR) to examine the literature on FWAs available in Pro-Quest from 2000 until 2020. SSCR is a quick method for finding specific information in a broad and extensive literature collection and then clustering the information based on inherent similarity. There is a downside because the authors did not consider the high-impact peer-reviewed journals published in Web of Science and Scopus. Many Malaysian scholars treat FWAs as part of Work-Life-Balance (WLB) and Work-Family-Balance (WFB). It is noted that there needs to be more research on FWA rules and policies in Malaysia. The policies and rules about WLB in Malaysia were deliberated by Noor and Mahudin (2015), but they did not factor in Sabah and Sarawak's employment legislation. A-Qudsi (2018) focused on the work-family balance (WFB); however, legislation of WFB for the private sector needed to be more clearly articulated.

According to Shaari and Amirul (2020), the employment laws needed to keep pace with the development of contemporary working arrangements due to fixed working hours and locations. The authors in the said article called for the government to consider adopting the law as practised in the United Kingdom and Australia. A similar observation was made by Wahab et al. (2022) that Malaysian labour legislation still needs to be updated to reflect the rise of the new-norm work to protect the rights of both employers and employees. Wahab et al. (2022) did not reference the employees in Sabah and Sarawak, unlike the study by Shaari and Amirul (2020).

Many governments are currently introducing or updating existing regulations to accommodate FWAs. The government of Malaysia introduced the FWAs regulations to the EA 1955 via the Employment (Amendment) Act 2022 (the Amendment Act 2022), which came into effect on 1 January 2023. However, the Sabah and Sarawak Labour Ordinances have yet to receive a comparable modification. The new FWAs in the EA 1955 are less detailed than many would anticipate. Shaari & Amirul (2023b) do not dwell on the newly regulated FWAs in detail, as the article focused on the right to disconnect (RTD), first regulated in 2017 by the French government. The authors submitted that the Malaysian policymakers had missed the opportunity to enhance the employees' WLB by not incorporating the RTD when they amended the EA 1955 to embed the FWAs regulations.

There is a dearth of research on the FWAs policies and legislation in Malaysia except for a very small number of studies (Noor & Mahudin, 2015; A-Qudsi, 2018; Shaari & Amirul, 2020; Amirul & Shaari, 2021; Wahab et al., 2022; Shaari and Amirul, 2023a, and Shaari and Amirul, 2023b). When writing this paper, no scholarly literature scrutinises the effect of the new FWAs regulations embedded in the EA 1955. Hence, this paper will be able to close any gaps in the existing literature.

METHODOLOGY

This study deploys the methodology commonly used in a legal study known as traditional legal research or doctrinal research. According to Langbroek et al. (2017), legal researchers typically attempt to resolve the issue by systematically analysing the legal concepts, rules, theories, doctrines, decided cases, issues, or a combination of any or all of them. It is typically necessary to cite academic writings, expert opinions, legal precedents, relevant statutes, and research from related fields. Legal researchers frequently conclude from the legal analysis, including recommendations to improve the law. In this study, the authors critically appraise the newly introduced FWAs regulations in the EA 1955.

DISCUSSION

The COVID-19 outbreak has demonstrated to the Malaysian government, businesses, and employees that working arrangements must be adjusted to cope with the pandemic. Many employees had to work from home (WFH) during the MCOs. Covid-19 was an eye-opener to all stakeholders on the viability of FWAs, especially WFH. Realising the

importance of FWAs and keeping abreast with the employment law practised in developed countries, FWAs must be regulated. Parliament of Malaysia recognised flexible working arrangements through the Employment (Amendment) Act 2022 (the Amendment Act 2022), which amended the EA 1955 by adding Part XIIC: Flexible Working Arrangement, which comprised of the following two sections setting out the general substantive and procedural requirements for flexible working:

Section 60P— Statutory right to request contract variation and

Section 60Q— Employer's duties about the application under section 60P.

However, both authors submit that the long-awaited FWA provisions turned out to be different from what was expected. The FWAs legal provisions are very brief, unlike the regulations in the UK or Australia, hence creating lacunae in the law. The new provisions are as shown below:

Section 60P: Flexible Working Arrangement

1. Subject to Part XII or anything contained in the service contract, an employee may apply to an employer for a flexible working arrangement to vary the work hours, days of work or place of work about his employment.
2. Where there is a collective agreement, any application made by the employee under subsection (1) shall be consistent with the terms and conditions in the collective agreement.

Section 60Q: Application for Flexible Working Arrangement

1. The employee shall apply for a flexible working arrangement under section 60P in writing and in the form and manner determined by the Director General.
2. Upon the application made under subsection (1), an employer shall, within sixty days from the date such application is received, approve or refuse the application.
3. The employer shall inform the employee in writing of the employer's approval or refusal of the application under subsection (1), and in the case of a refusal, the employer shall state the grounds for such refusal.

Based on section 60P (1), an employee may request the employer to modify his work hours, days of work or even his place of work. Section 60P (2) provides that the employee's application for FWAs shall be congruent with the collective agreement which applies to the workplace, if any. However, section 60P (1) does not specify the eligibility requirement relating to who may apply for FWAs. The authors raise two issues here. Firstly, does it mean that all employees may request for FWAs? The UK Parliament created the right to request and the duty to consider flexible working arrangements through the Employment Act of 2002, which amended the Employment Rights Act 1996 (ERA, 1996) by adding Part 8A: Flexible Working. It came into effect on 6 April 2003. It was initially catered for parents having children under the age of six. In 2009, the right to request flexible working hours was extended to parents of all children under the age of 17 from 2009 (or 18 in the case of disabled children) and carers of disabled children or adults (Dancaster, 2006).

Meanwhile, the right to request FWAs is one of the 11 minimum standards of employment established in the National Employment Standards (NES) set out in the Fair Work Act 2009 (Cth), which must be provided to all national workplace system employees in Australia. It came into effect on 1 January 2010. The NES allows employees to make formal requests for FWAs if they are the parent of a pre-school-aged child or a child with a disability under 18. It was further expanded in July 2013 (Cooper & Baird, 2015). It could be seen that the policymakers in both countries targeted the FWAs for parents having school-aged children and carers of disabled children or adults. Nevertheless, Part XIIC of the EA 1955 is silent on this issue.

Secondly, does it imply that an employee in Peninsular Malaysia can apply for FWAs from day one of joining the company? In the UK, section 3 of the Flexible Working Regulations 2014, which took effect on 30 June 2014, provides that an employee must be continuously employed at least 26 weeks before requesting FWAs (Cook et al., 2021).

In Australia, an employee must work with the employer for at least 12 months before making the request (Cooper & Baird, 2015). Is it the policymakers' intention to allow each company to establish the eligibility requirement under its FWAs policy? If the latter is the cause, then new concerns are raised. The first concern is that the eligibility requirement may vary from one company to another. The second concern is whether businesses, particularly micro, small, and medium-sized enterprises (MSMEs), comprehend their new obligations to establish the FWAs policy at their workplaces. The third concern is whether self-regulation is viable in MSMEs. Croucher & Kelliher (2005) found that large companies in the UK have gone above and beyond the requirements of the law to position themselves as "preferred employers". Do MSMEs in Malaysia have sufficient financial and professional support to operationalise FWAs at their workplaces?

The authors argue that Section 60Q creates further lacunae in the law. The DG has yet to issue the guidelines as form and manner of the FWAs application as stated in section 60Q(1) at the time of writing this article. Section 60Q (2) provides that the employer shall respond within 60 days of the application's receipt, be it approval or rejection, similar to the legal requirement in Australia's Fair Work Council 2009 (Cth). The newly amended law in the UK concerning FWAs, the Employment Relations (Flexible Working) Bill, received Royal Assent on 20 July 2023, which provides that the employers must respond within two months (previously three months) upon receiving the employee's request. What is the legal recourse for Malaysian employees if the employer does not respond within the time frame?

Section 60Q(3) provides that the employer shall inform the employee in writing of approval, and in the event of refusal, the employer shall state the grounds of refusal. There is no further explanation as to the grounds for such refusal. The UK law provides that the employers are required to prove that their refusal complies with one or more of the mentioned reasons stated in section 80G(b) of ERA 1996, known as eight business grounds, among other things, the weight of higher costs; a negative impact on the ability to satisfy customer demand; an inability to rearrange work among current employees.

The newly added regulations on Malaysian FWAs do not stipulate any legal recourse for an employee whose request for FWAs is rejected without justifiable grounds, unlike its counterpart in the UK. If the UK employer does not handle requests reasonably, the employee can take them to the employment tribunal. A question arises whether the aggrieved employee can claim that the employer's rejection of the request for FWAs amounts to discrimination in employment as stated in the newly added section 69F of the EA 1955. Disputes involving employment discrimination between an employer and an employee may now be investigated and decided by the Director General. However, section 69F of the EA 1955 needs more clarity and identifies what amounts to discrimination in employment.

On another premise, is it possible for an employee whose application is refused to treat herself to be constructively dismissed? In a constructive dismissal, the employee must fulfil all the prerequisites. Namely, the breach is fundamental and goes right to the root of the contract; the employee must inform the employer that he treats himself to be constructively dismissed and leaves his employment without delay. He must file his representation under s.20(1) Industrial Relations Act 1967 within 60 days from leaving the employment.

The newly added provisions on FWAs in the Employment Act 1955 only apply to the employees working in the private sector having a workplace in Peninsular Malaysia. The employees working in the private sector in Sabah and Sarawak are left at their employer's discretion when requesting FWAs, as both the Sabah Labour Ordinance 1950 and Sarawak Labour Ordinance 1952 have yet to be amended. The newly introduced provisions of FWAs had only been in force for a brief time when this paper was written. Thus, it will be interesting for future research to observe how the FWAs legislation is implemented and operationalised over time.

CONCLUSION AND RECOMMENDATIONS

The state of the pandemic crisis has further accelerated the development phase of FWAs, particularly WFH, in Malaysia. Regulating FWAs will enhance working conditions and safeguard employees' rights. Though lightly regulated, it demonstrates that the government understands the need to adapt to the new working arrangements practised in developed countries. However, the authors think new legislation is disappointing as issues still need to be answered. It is recommended that Malaysian policymakers compare the FWAs legislation practised in other countries such as the United Kingdom and Australia. Research could be done to determine how FWAs legislation is operationalised. At the point of this study, the FWAs legislation was recently implemented. Hence, this study has its limitation on the unavailability of the court cases concerning FWAs in Malaysia. The findings can be summed up that the newly added FWAs legal provisions are very brief, which creates lacunae in the law. Nevertheless, it is better to be regulated regardless of how simple the regulations are rather than not having any at all.

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Paper Contribution to Related Field of Study

This study advances three significant new insights. First, it is an addendum to the body of knowledge. Second, this research sheds light on the variations in employment law across Peninsular Malaysia, Sabah, and Sarawak. Third, this paper offers insight into Malaysia's newly introduced FWAs legislation.

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THE RELATIONSHIP BETWEEN FIRM CHARACTERISTIC AND BOARD OF DIRECTORS CHARACTERISTICS ON FIRM'S FINANCIAL PERFORMANCE OF MALAYSIAN PUBLIC LISTED COMPANIES

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ABSTRACT

The relationship between ownership structures, board gender diversity, and the Chief Executive Officer's financial expertise towards the firm's financial performance of Malaysian public-listed companies has been a prolonged issue raised and debated by stakeholders, including policymakers or government, shareholders, investors, academicians, researchers, analysts, and other interested parties. Therefore, this study examines the relationship between ownership structures (government ownership, family ownership and foreign ownership), board gender diversity and the CEO's financial expertise towards the firm's financial performance of Malaysian public-listed companies. Previous researchers prove that all these factors impact a firm's financial performance. A total of 259 companies listed in Bursa Malaysia were reviewed over 11 years from 2009 until 2019. Statistical tests, for instance, descriptive, correlation, and regression analyses, were conducted. Tobin's Q and accounting rate of return are used to measure a firm's financial performance. This study's result shows a significant relationship between government ownership, foreign ownership and a firm's financial performance based on accounting profitability measurement using ROA. In addition, using Tobin's Q as a performance measurement, foreign ownership and board gender diversity show a significant relationship with a firm's financial performance. In conclusion, the findings of this study provide a further understanding of the ownership structures, board characteristics and CEO characteristics and their impacts towards a firm's financial performance.

Keywords: board gender diversity, ownership structure, financial performance, CEO characteristics and financial expertise.

INTRODUCTION

In the Malaysian corporate environment and landscape, the business environment is dominated by family-controlled (FAM) and government-owned companies (GOV) (Ibrahim et al., 2011). In this research, evidence was gathered to investigate whether different ownership structures will affect the FFP in the context of the Malaysian capital market. MPLCs can achieve high FFP if they can meet short as well as long-term obligations and manage their liquidity effectively and efficiently. However, the global economic downturn of recent years had a bad impact on FFP in many countries, including Malaysia (Jalila & Devi, (2012).

The problem has been overlooked when many firms have fallen and collapsed over time, while some have been standing strong (Javeed & Lefen, 2019). To support this statement, 21 MPLCs were reported under Practice Note (PN17) as of September 30, 2021, with various issues, including corporate governance issues.

An organisation's Strategic decisions are influenced by top-echelon features such as demographics, educational background, functional track, and other work-related experiences, in addition to CEO incentives to keep their position for years (Seongjae et al., 2020).

The MCCG 2012 contains a mere suggestion for organisations to create gender diversity guidelines and policies. Companies must declare their plans to appoint more women to their boards, including identifying targets and measures to accomplish those targets, according to the MCCG 2017. Moreover, large corporations are expected to hire a minimum of 30 per cent women into their boards. (The New Straits Times, 2017).

Board gender diversity could improve board interaction and oversight processes (Joy, 2008). Qian et al. (2019) discovered that having female directors can alleviate the downsides of having independent directors. Female directors are more likely than independent directors to take part in independent thinking and diligence in governance (Adams & Ferreira, 2009).

For decades, the issue of organisational structure and FFP have become a topic of heated discussion in corporate governance (Srivastava, 2016; Siti Suziyati, 2016). In addition, in many countries, including Malaysia, different ownership structures will always cause problems of “separation of ownership from control” (Siti et al., 2021).

Large companies’ downfall due to scandals in the corporate world, such as WorldCom, Parmalat and Enron, are linked to the companies’ poor corporate governance practices (Costa, 2017). It resulted from the management’s misleading and misinterpreting information and lack of transparency in the board’s decision-making processes (Zandi et al., 2020).

Malaysia also suffered the same issues as Italy, the United Kingdom, and the United States. For instance, in 2007, the Transmile Group fell into bankruptcy, resulting in a loss of 1.2 billion in market capitalisation; Megan Media sustained 1.27 billion and a negative cash flow of 897 million (Hamid et al., 2013). This was followed by the Port Klang Free Zone (“PKFZ”) and the Federal Land Development Authority (“FELDA”) cases. (Hamid, Shafie, Othman, Hussin, & Fadzil, 2013)

As cited in a Malaysian newspaper dated 15 November 2019, FELDA was involved in a recent corporate scandal in which RM1 billion was transferred unlawfully in 2015. On 15 November 2019, FELDA and its subsidiaries sued two (2) former chairmans, Tan Sri Isa Samad and Shahrir Samad, and 20 others in conspiracy to defraud the government agency (Bernama, 2019).

The news on Malaysia’s most controversial government-linked investment firm, the 1 Malaysia Development Berhad (“1MDB”), where RM4.5 billion worth of money was laundered through a series of complex transactions and fraudulent shell companies with bank accounts in Switzerland, Luxembourg, the United States, and Singapore, shook the economics and financial journalists (Bernama, 2019).

In addition, aside from the management team, the BODs are amongst the most frequently targeted targets of shareholder criticism from the shareholders for any poor FFP. Furthermore, the shareholders’ wealth relates to FFP. If the shareholders’ wealth is declining, something abnormal occurs that needs to be investigated (Zandi et al., 2019).

In conclusion, all of Malaysia’s fraud cases, such as 1MDB, FELDA, PKFZ, Transmile, Megan Media and others, have motivated a new study on the link between ownership structures, board gender diversity, and CEO’s financial expertise and a firm’s financial performance of Malaysian public-listed companies. The BODs and CEO characteristics are being added to the study as they are the key persons in the organisation, and they make decision-making (Zandi et al., 2019). Even though firms can improve and increase their financial performance in many ways, including investment, proper cost monitoring and others, the corporate governance elements cannot be put aside. Ownership structures, board, and CEO characteristics must be reviewed occasionally. It ensures that the company’s management follows the policy and procedures.

Hence, the ultimate objective of this study is to examine the relationship between corporate governance and the FFP. The five (5) specific research objectives to be achieved in completing this study are RO1: To investigate the relationship between government

ownership and a firm's financial performance of the listed public companies. RO2: To investigate the relationship between family ownership and the firm's financial performance of the listed public companies in Malaysia. RO3: To investigate the relationship between foreign ownership and the firm's financial performance of the listed public companies in Malaysia. RO4: To investigate the relationship between board gender diversity and the firm's financial performance of the listed public companies in Malaysia. RO5: To investigate the relationship between the CEO's financial expertise and the firm's financial performance of the listed public companies in Malaysia.

METHODOLOGY

Population and Sample Selection

For this research, the unit or components of analysis used are firm, company or organisation. The population is from the main market, Bursa Malaysia, which consists of Malaysian companies listed as of 31 December 2019. The total initial observation or number of MPLCs is 806 companies for the sample size. After details were reviewed based on criteria set earlier, only 259 companies were selected. The data gathered for each company is from 2009 until 2019 (11 years).

The sample size excludes firms not providing full information in their annual report and non-financial companies and financial institutions. The industries selected are construction, health care, hotels, properties, utilities, plantations, consumer products, industrial products, technology, trading and services and mining.

The sampling method used is a simple random sampling where all 806 companies listed in Bursa Malaysia have an equal chance of being selected in the first stage or process. Then, the stratified sampling is used when the Companies are selected based on the non-financial companies or non-financial institutions and selected based on industry.

Non-probability sampling was also used when the researcher selected samples based on the subjective judgment of the researcher rather than random selection. It is a less stringent method. Only firms with available data in the annual report are being considered, and firms with full information of the 30 largest shareholders listed in its annual reports.

The period from 2009 to 2019 was chosen to illustrate a period of relative economic stability in Malaysia. This is after the Asian and global financial crises (IMF, 2008; Fidrmuc & Korhonen, 2010).

The process of selecting the listed public companies is summarised as follows: 1. The company have issued 11 years of financial statement from 2009 until 2019. The main reason is to measure the long-term performance. 2. Exclusion of financial institutions and insurance related companies. 3. Exclusion of firms not providing full information in their annual report, as shown in Table 1.

Table 1

Calculation of Sample Selection of Sample Firms

Full companies listed in Bursa Malaysia as of 31 December 2019	806
Less: Finance, insurance, and real estate investment trust	33
Less: Company without filling information in the annual report	514
Total selected companies	259

Dependent Variable

FFP is the chosen DV that will indicate the outcome of the changes made by IV. The DV represents the main topic to discuss in this research and is relevant to the researcher since it measures the effect of all five (5) independent variables selected. The measurement of the DV is based on the market-based performance approach and accounting-based performance.

For ABP, return on assets is used using the net income formula divided by total assets. The data are gathered from annual reports. The ROA measures a firm's asset utilisation based on the profitability of its total assets. The ROA is best utilised when comparing a firm to its prior performance.

The measurement of MBP is using Tobin's Q. The formula for Tobin's Q is market capitalisation plus total debt divided by total assets (Pang & Nik, 2016). Tobin's Q was widely used to explore the connection between firm performance and corporate governance (Christensen et al., 2010; Ibrahim et al., 2011; Osazefua, 2019; Osazefual Mhanzenobe, 2020).

Tobin's Q as a market-based indicator and approach of company success is consistent with the successful business hypothesis in which a firm's market value evaluates the usage of current assets and the potential for future growth (Christensen et al., 2010).

Independent Variables (IV)

IVs are the ones who influence the selected DV. GOV, FAM, FOR, BGD and CFE are the chosen IVs utilised to find the connection between them to get the ultimate result and conclude which factors hugely impact the FFP in Malaysia.

The findings will help the researcher understand more about Malaysia's FFP trend. For IVs, the percentage of ordinary shares held by each owner in the firm is used to measure GOV, FAM, and FOR (Pang & Nik, 2016). The indicators are as depicted in Table 2.

Table 2

Research Indicators

Scope	Variable Label	Indicators	Prevailing Literature
Government ownership	GOV	Percentage (%) of shareholding listed in the top 30 major shareholders listed in an annual report	(Al-Matari, 2019)
Family ownership	FAM	Percentage (%) of shareholding listed in the top 30 major shareholders listed in an annual report	(Wang & Shailer, 2017)
Foreign ownership	FOR	Percentage (%) of shareholding listed in the top 30 major shareholders listed in an annual report	(Abdullah, Ismail, & Nachum, 2016)
Board gender diversify	BGD	Female in board - 1 No female on board - 0	(Bear, Rahman, & Post, 2010)
CEO's financial expertise	CFE	Yes - 1 (having financial expertise) No - 0 (no financial expertise)	(Hambrick & Mason, 1984)
Return on assets	ROA	Net income / total assets	(Abdul, 2002)
Tobin's Q.	TOBINQ	(Market capitalisation + total debt)/ total assets	(Ahmad Saiful Azlin, Zubaidah, Malcolm, & Anuar, 2019)

Data. Collection. Method

Data collection comprises collating and gathering data and information from primary or secondary data. To fulfil the purpose of this research, secondary data is used and gathered from the annual reports published by Malaysian PLCs. The secondary data will

assist the researcher in defining the problem, formulating and designing the research, and interpreting the results.

This research focuses on secondary data from several acceptable sources, including the company's website. Reliability and accuracy are crucial, and the secondary data is gathered from the DataStream and annual reports. Collation time is also saved as the researcher only used the above sources. The SPSS was used to analyse the data.

According to the systematic random sampling method, the researcher collected data from annual reports, audited financial statements and corporate governance reports of 806 non-financial firms listed on Bursa Malaysia. The data gathered covers 11 years, from 2009 until 2019. After collecting enough data on 806 listed firms, companies that did not have sufficient data continuously for 11 years were eliminated.

Procedure Of Data Analysis

The data was analysed by the researcher using SPSS version 27. This software is used to analyse the data gathered and collected from the annual reports. The software can analyse data using various methods and tests in graphical and statistical data analysis. Statistical data analysis, which encompasses descriptive analysis, correlation, multivariate analysis, factor analysis, analysis of variance and other functions, is one of its features.

SPSS can also offer a means of analysing the regression model's adequacy, including checking regression assumptions. The SPSS software aided the researcher by running the secondary data that had previously been collected.

Multiple Linear Regression Model

In order to evaluate the hypothesis of this study, the researcher applied the Multiple Linear Regression Model ("MLRM"). In economics and business, this regression technique often examines the relationship between the dependent and independent variables. A correlation analysis is required to determine the correlation between the two variables. Multiple Regression is a statistical tool to identify the relationship between two or more variables. The link is described by a mathematical equation that provides the foundation for estimating a dependent variable's values using an independent variable's values. The model derived from the Multiple Regression Model analysis is as follows:

$$Y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \varepsilon$$

Where: FFP	Dependent Variable
β_0	Constant
β_1	Coefficient describes how changes in government ownership affect the Firm's financial performance.
β_2	Coefficient describes how changes in family ownership affect the FFP.
β_3	Coefficient describes how changes in foreign ownership affect the FFP.
β_4	Coefficient describes how changes in board gender diversity affect the FFP.
β_5	Coefficient describes how changes in the CEO's financial expertise affect the FFP.
ε	Random error term
x_1	Government ownership
x_2	Family ownership
x_3	Foreign ownership
x_4	Board gender diversity
x_5	CEO's financial expertise

LITERATURE REVIEW

Firm's Financial Performance (FFP)

FFP is usually measured by using accounting profits. However, different techniques can be used to measure accounting profits, and the results can differ. For instance, there are different methods to evaluate tangible and intangible capital. Likewise, there are different ways of calculating depreciation. Discretionary accruals and discretionary expenses are also tools by which accounting profits can be manipulated (Zandi et al., 2019); (Sadiq & Othman, 2017).

Previous researchers used several measurements in analysing the FFP, usually divided into two (2) categories or bases. The normal evaluation method used is the accounting profitability method or accounting profitability-based performance and market performance method or market-based performance (Fauzi & Musallam, 2019).

For MBP, previous researchers used Tobin's Q firm performance measure (Phung & Hoang, 2013), accounting profit rate (Gholamreza et al., 2020), ROA (Abdul, 2002), ROE (Xu & Chen, 2019), PE (Almajali, 2012), PTBV (Al-Thuneibat, (2018).

The FFP can also be analysed regarding profitability, dividend growth, sales turnover, asset-based and capital employed (Almajali, 2012). Al-Ahdal et al. (2020) measured FFP by ROA and ROE. Besides ROA and ROE, Awais et al. (2018) also used net profit margin ("NPM") as a performance measure.

Tobin's Q, which is measured as the market capitalisation ratio plus the total debt divided by the company's total assets, is a standard MBP commonly used as a proxy for firm success in the analysis of the relationship between corporate success and corporate governance (Dybvig & Warachka, 2015).

Underpinning Theory

The agency theory is used in this study as the study is related to the relationship between the principal and the agent. Jensen and Meckling (1976) define that agency relationship occurs when an agent or a manager acts as a decision-maker in the firm on behalf of the principal, the owner or the shareholders. The agent's contribution is to expand the shareholders' wealth through the growth of market stock price and firm profitability (Shleifer & Vishny, 2008).

Ownership structures refer to "the relative amount of ownership claims held by insiders (managers) and outsiders" (investors with no direct relationship with the management of the firm). Ownership structures are the key to determining the nature of agency theory, whether the dominant conflict is between managers and shareholders or between majority and minority shareholders. It is suggested that better overlap between ownership and management should be guided to minimise conflicts of interest between them, resulting in higher firm performance (Holderness, 2019).

According to agency theory, shareholders appoint CEOs who align the firm's goals with maximising shareholders' wealth. Therefore, CEOs are supposed to make strategic decisions to maximise shareholders' wealth and have a strong incentive to maximise FFP to maintain their position. In addition to CEOs' incentives to secure their position, a firm's strategic decisions are driven by upper echelon characteristics such as functional track, demographics, educational background, and other career-related experiences (Hambrick & Mason, 1984).

Government Ownership and Firm's Financial Performance

Several factors, including ownership structures, can contribute to a high firm's financial performance in Malaysia. There are some common ownership structures or shareholders

in Malaysia. Previous researchers discovered that government ownership is among the most common shareholders in Malaysian's listed public companies (Abdul, 2002; Nazrul Hisyam, 2014).

When the government has a controlling ownership of certain firms, the government will have an opportunity to control and monitor the firm's management and operations closely and effectively, thus decreasing the business's expenses and directly improving the firm's competitiveness (Villalonga, 2019).

In this study, it is believed that there is a positive significant relationship between GOV and FFP. This hypothesis is proposed in line with Anderson and Reeb (2013), which stated that experienced institutional investors like GOV are able to manage distress risks better than their inexperienced counterparts.

This proposed hypothesis is also agreed by Le and Buck (2011), who studied the relationship between GLCs and FFP. They reported that there is a positive relationship between GOV and FFP. The study further revealed that GLCs normally has good reputation and performance and suffer less from financial difficulties and distress. Therefore, the following hypothesis is concluded:

H1a: There is a significant relationship between government ownership and a firm's financial performance (ROA) of the listed public companies in Malaysia.

H1b: There is a significant relationship between government ownership and a firm's financial performance (Tobin's Q) of the listed public companies in Malaysia.

Family Ownership and Firm's Financial Performance

Aljifri and Moustafa (2009) stated that the trust between family members has created a conducive and favourable working environment. This can happen if the family members have several shares that exceed a certain threshold and indirectly gain control over a firm member (Anderson & Reeb, (2013), (Villalonga, (2019).

The literature has found a positive association between family-controlled firms (FAM) and FFP (Wang & Shailer, 2017). In addition, Umrani et al. (2017) found that family-controlled firms successively produce more new products to sustain long-term. As a result, such product innovation enables firms to seize chances quickly and decisively, thereby increasing operational efficiency and firm financial performance.

The proposed hypothesis stated that there is a positive significant relationship between FAM and FFP (Fama & Jensen, (2003). Furthermore, Jensen and Meckling (1976) agreed that there is a positive impact on family-controlled firms. The family members can easily monitor the firm's financial performance and reduce the agency's costs. Therefore, the following hypothesis is proposed:

H2a: There is a significant relationship between family ownership and the firm's financial performance (ROA) of the listed public companies in Malaysia.

H2b: There is a significant relationship between family ownership and the firm's financial performance (Tobin's Q) of the listed public companies in Malaysia.

Foreign Ownership and Firm's Financial Performance by Che-haat et al. (2008) indicates that FOR has a strong predictive power in the FFP of public-listed companies in Malaysia. FOR investors prefer to invest in a country with strong investor protection by the government. It can be a win-win situation if the investor can invest more money in the country.

The proposed hypothesis suggested a positive significant relationship between FOR and FFP. Boyer and Zheng (2009) and Douma et al. (2006) reported a positive relationship between the FOR and FFP. The higher the FOR shares, the better the FFP will lead to lower bankruptcy risks. Therefore, the following hypothesis is proposed:

H3a: There is a significant relationship between foreign ownership and the firm's financial performance (ROA) of the listed public companies in Malaysia.

H3b: There is a significant relationship between foreign ownership and the firm's financial performance (Tobin's Q) of the listed public companies in Malaysia.

Board Gender Diversify and Firm's Financial Performance

Lie et al. (2014) reported that female directors exert a stronger positive effect on a firm's financial performance, especially those controlled by legal entities because female directors in controlling firms devote much effort to monitoring and improving their firms' operations and financial performance.

Compared with their male counterparts, female directors show more concern for the sensitivity of their stakeholders and make better decisions (Bear et al., 2005; Huse, 2005; Hillman, 2007; Milliken & Martins, 1996), which can contribute to high-firm performance (Canyon & He, 2017). Board gender diversity can also improve corporate governance (Gur et al., 2011).

The proposed hypothesis suggested that there is a positive significance. Relationship between board gender diversity and firm's financial performance. Erhardt et al., 2003 and Finegold et al. (2007) found a positive relationship between female directors and firm performance amongst US companies as measured by Tobin's Q. Therefore, the following hypothesis is proposed:

H4a: There is a significant relationship between board gender diversity and the firm's financial performance (ROA) of the public companies listed in Malaysia.

H4b: There is a significant relationship between board gender diversity and the firm's financial performance (Tobin's Q) of the public companies listed in Malaysia.

CEO's Financial Expertise and Firm's Financial Performance

CEOs play important roles in the firms such as decision-maker policy, influencers, risk managers and strategy direction planners (Zahra & Pearce, 2009). In other words, a CEO with financial expertise is the key driver in FFP (Ren et al., 2020). A CEO with a high education in finance can monitor unscrupulous activities (Ren et al., 2020).

In addition, the CEO's financial expertise and controlling family ownership may influence each other to affect the firm financial performance. In other words, insights could be obtained by observing how they interact, for instance, whether higher CEO education can moderate the effects of FAM on firm financial performance activities (Ren et al., 2020).

The proposed hypothesis suggested that there is a positive significant relationship between CFE and FFP. The CEO's financial expertise contributes to firm financial performance and success (Rosman et al., 2018). Therefore, the following hypotheses are proposed:

H5a: There is a significant relationship between the CEO's financial expertise and the firm's financial performance (ROA) of the public companies listed in Malaysia.

H5b: There is a significant relationship between the CEO's financial expertise and the firm's financial performance (Tobin's Q) of the public companies listed in Malaysia.

Conceptual Framework

The main objective of this research is to examine the relationship and connection between several categories of ownership structures, corporate board gender diversity and the CEO's financial expertise towards the firm's financial performance of the public companies listed in Malaysia. The measurement of the DV is based on accounting-based performance ("ABP") and market-based performance ("MBP"). For ABP, return on assets ("ROA") is used using the net income formula divided by total assets. IVs are the ones who influence the selected DV. Government ownership ("GOV"), family ownership ("FAM") and foreign

ownership ("FOR") are the IVs chosen that are used to find the relationship in order to get the ultimate result and finally to conclude which factors give huge impacts on the FFP in Malaysia.

RESULTS AND DISCUSSION

Descriptive Analysis

Table 3 shows the descriptive analysis of the independent variables ("IV") and dependent variable ("DV") of the firm's financial performance ("FFP"). The sample of this study is drawn primarily from the audited financial statements and annual reports of 259 MPLCs in Bursa Malaysia covering an 11-year period from 2009 until 2019. The observation period of 2009 to 2019 was chosen. This time is before the global financial crisis but after the Asian financial crisis (IMF, 2008; Fidrmuc & Korhonen, 2010). Summary statistics of all variables as proxies of FFP, ownership structures, BGD and CFE are shown in Table 3. FFP indicators are presented by ROA and Tobin Q, while the rest of the data is the statistics for the independent variables.

Table 3

Descriptive Statistics

Variable	Mean	St. Dev	Median	Min	Max
ROA	0.1175	0.2494	0.1021	-2.7425	5.9076
TOBINQ	3.9468	7.3296	3.6099	-37.1425	43.8667
GOV	11.1087	15.6272	5.0900	0.0000	95.3800
FAM	14.8078	20.27816	1.9900	0.0000	84.7000
FOR	8.2425	13.3820	3.0200	0.0000	75.3200
BGD	0.5900	0.4920	1.0000	0.0000	1.0000
CFE	0.4000	0.4900	0.0000	0.0000	1.0000

Note: ROA: Net income / total assets; TOBINQ; (market capitalisation + total debts)/ total assets; GOV: the percentage (%) of government shareholdings listed in top 30 major shareholders in annual report; FAM: the percentage (%) of family shareholdings listed in top 30 major shareholders in annual report; FOR: the percentage (%) of family shareholdings listed in top 30 major shareholders in annual report; BGD: women in board;1. No women in board;0; CFE; CEO with financial expertise:1 without financial expertise;0.

Return of Assets (ROA)

FFP indicators for this study are divided into two (2) different measurements. The measurement of the DV is based on accounting-based performance and market-based performance. For ABP, return on assets is used using the formula of net income divided by total assets, where a higher value indicates that the level of performance is high and vice-versa.

Table 4 shows a comprehensive descriptive statistic for ROA. This study shows that the minimum ROA ratio for 259 Malaysian listed public companies is -2.7425, while the maximum is 5.9076. The mean value of ROA is 0.1175, indicating that the firms are profitable at around 11.8% of their total assets and invested capital. We noted that each company has having different ROA, as the ROA is derived from the company's performance and financial position.

Tobin's Q (TOBINQ)

Another measurement of the DV is using the MBP, where Tobin's Q is used. The average values of Tobin Q represented market performance is 3.9468. Figures in Table 4 also show

that the value of Tobin's Q varies from -37.1425 to 43.86667. This implies that there was a significant gap in the firm's financial performance among MPLCs during this period.

Government ownership (GOV)

Table 4 above shows a comprehensive descriptive statistic for government ownership in Malaysia. The reported mean score for GOV is 11.11%, with a huge range between 0.00% and 95.38%. The percentage was based on the top 30 shareholders listed in each company's annual report. Based on the mean score of 11.11%, GOV is one of the most common largest shareholders in MPLCs in Bursa Malaysia (Abdul, 2002). The findings are like the research done by Fauzias (2010), which stated that GOV is among the largest shareholders in Malaysia besides FAM.

Family Ownership (FAM)

When discussing the Malaysian corporate environment and landscape, FAM and GOV dominate the market with a mean score of 14.81% and 11.11%. The range of ownership for families is between 0.00% and 84.70%. The range is huge, and we can see that some companies are dominated by family members, with the highest percentage of ownership of 84.70%.

Foreign Ownership (FOR)

If we compare the ownership between GOV, FAM and FOR, FOR is in the lowest rank with a mean score of 8.24% with the ownership range between 0.00% and 75.32%. Ahmad et al. (2019) agreed that FOR is also one of the leading owners in Malaysia.

This further analysis suggests that family shareholders controlled most MPLCs (around 40% of the sample) between 2009 and 2019. Government shareholders and foreign shareholders were found to be the second (2nd) and third (3rd) categories of shareholders that controlled most MPLCs (30% and 20%, respectively, of firms in the sample).

Family shareholders were higher in MPLCs after the financial crisis due to family shareholders having more incentive to control firms and attempting to increase their cash-flow rights in the firms. Additionally, because these family shareholders controlled an average of more than 50% of the firm's shares, they retained considerable control authority over the firm's management.

Board Gender Diversity (BGD)

In Malaysia, the mean score for BGD is 0.59, indicating that 59% of the MPLCs have at least 1 female director on the board. This is a good sign of the involvement of women in Malaysia's business world. It is hoped that the percentage will increase from time to time.

CEO's Financial Expertise (CFE)

The mean score for CFE is 0.40, indicating that 40% of the CEOs have a financial background based on educational certificates. This percentage needs to be improved in the future as financial expertise is important in the decision-making process. Seongjae (2020) also agreed that CFE affects a company's corporate strategy and performance.

Multiple Linear Regression Analysis

There are five (5) independent variables ("IV"), namely GOV, FAM, FOR, BGD and CFE, with one dependent variable ("DV"), which is FFP. Regression analysis was used in this study to test the contribution of five (5) IVs in predicting DV. Furthermore, regression was used to explain the impact of IV changes on DV.

Model 1: Accounting Based Performance Using Return On Assets (ROA)**Table 4***Coefficient (ROA) Unstandardised Coefficient*

	B	Standardised Coefficient	
		Std. Error	Beta
Constant	0.085	0.010	-
GOV	0.001	0.000	0.044
FAM	0.000	0.000	0.019
FOR	0.001	0.000	0.078
BGD	0.012	0.010	0.023
CFE	0.006	0.010	0.011

Table 5*Model Summary of Regression (ROA)*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.090	0.008	0.006	0.2485837

a. Dependent Variable: ROA

b. Predictor (Constant), CFE, FOR, BGD, GOV, FAM

Table 5 shows the model 1 summary of regression analysis for the study. Based on the result in Table 6, the R square is 0.008. This indicates that the variation in GOV, FAM, FOR, BGD and CFE can explain .6% of the variation in FFP. The percentage is quite low, indicating that other factors can influence FFP in MPLCs.

Table 6*ANOVA Model*

	Sum of Squares	df	Mean Square	F-value	Sig.
Regression	1.441	5	0.288	4.663	0.000
Residual	175.309		2837	0.62	
Total		176.750		2842	

a. Dependent Variable: ROA

b. Predictor (Constant), CFE, FOR, BGD, GOV, FAM

An F-test was conducted to determine whether there is a linear relationship between all the IVs considered together with the DV. The null hypothesis shows no linear relationship, and the alternate hypothesis shows at least one independent variable affecting the dependent variable. Table 4.7 shows the ANOVA result. Based on Table 4.7, shows that the significant value (p-value) is less than .05. The result indicates that the overall model is significant ($F_{5,2837} = 4.663$, p-value = .001). Hence, the null hypothesis is rejected. Therefore, there is evidence suggesting that at least one independent variable has a significant linear relationship.

Table 7

Coefficient (ROA) Unstandardised Coefficient

	B	Std. Error	Standardised Coefficient		
			Beta	t	sig.
Constant	0.085	0.010	-	8.309	0.000
GOV	0.001	0.000	0.044	2.248	0.025
FAM	0.000	0.000	0.019	0.936	0.349
FOR	0.001	0.000	0.078	4.105	0.000
BGD	0.012	0.010	0.023	1.233	0.218
CFE	0.006	0.010	0.011	0.582	0.561

The result tabulated in Table 4.8 above on the regression coefficient reveals that FOR and GOV have a significant positive relationship with FFP. Therefore, the first (1st) and third (3rd) hypothesis is accepted. Whereas there is no significant effect between FAM, BGD and CFE towards FFP.

CONCLUSION

Government Ownership and Firm's Financial Performance

The study's first (1st) objective is to investigate the relationship between governance ownership and the financial performance of Malaysian listed public companies. The result of the data analysis shows that there is a positive significant relationship between GOV and FFP based on an accounting-based measurement that uses return on assets as the dependent variable, but there is no significant relationship based on a market-based measurement that uses the Tobin Q as DV.

Previous studies have shown that there is a negative and positive relationship between GOV and FFP using different measurements. For MBP, previous researchers used Tobin's Q firm performance measure (Phung & Hoang, 2013). In contrast, for Accounting-Based Performance (ABP), various indicators have been utilized, including accounting profit rate (Gholamreza et al., 2020), return on assets (Abdul, 2002), return on equity (Xu & Chen, 2019), price-to-earnings ratio (Almajali, 2012), and price-to-book value ratio (Al-Thuneibat, 2018).

The result from the previous researchers stated that the FFP is positive and significantly related to GOV. These results imply that the GOV does not lead to a firm's value destruction and, in fact, it could lead to better monitoring of FFP (Fauzias, (2010). In addition, the government can monitor the firm's business and operation activities directly and indirectly and align them towards attaining higher profitability for a better FFP (Lau, 2008); Aljifri & Moustafa, (2009).

Besides that, Villalonga (2019) also agreed that if the government controls the ownership of certain firms, the government will have an opportunity to closely and effectively control and monitor the firm's management and operations, which could decrease the expenses of the business and firm and directly improves the competitiveness of the firm. In contrast, Taufil-Mohd (2013) found that there is a negative relationship between GOV and FFP. GOV normally lacks adequate entrepreneurial motivation and appears more politically driven than economically, resulting in poor FFP. In addition, Mak and Li (2001) agreed that the relationship of GOV states that the government appears to be less involved in tracking their investment.

Family Ownership and Firm's Financial Performance

The study's second (2nd) objective is to investigate the relationship between family ownership and the financial performance of Malaysian-listed public companies. The result of the data analysis shows that there is no significant relationship between FAM and FFP based on both ABM and MBM. Ghazali, (2020) found that the negative relationship might also be observed because the FAM might lead to unclear or undefined roles and responsibilities between FAM and family members, and it might seek to extract private benefits from the firm. In addition, FAM may also take actions that benefit their members at the expense of FFP because of substantial control rights and may lead to wealth expropriation in the presence of less-than-transparent financial markets. Besides Ghazali (2020), Sun (2013) also agreed that FFP is negatively and significantly related to FAM. This result indicates that higher FAM leads to weak corporate governance.

Foreign Ownership and Firm's Financial Performance

The study's third (3rd) objective is to investigate the relationship between foreign ownership and FFP of MPLCs. The data analysis results show a positive significant relationship between FAM and FFP based on both ABM and MBM. Previous researchers, including Halkos and Tzeremes (2010), Ghahroudi (2011) and Uwuigbe and Olunsanmi (2012), also found that FOR has a positive impact on FFP in Turkey, Japan, and Nigeria. The positive impact was due to managerial efficiency, technical skills, and the state of technology foreign owners brought into the working environment.

According to Oxelheim and Randoy (2013), the impact of FOR is positive and significant on firm performance. The results indicate that FOR monitors the managerial behaviours and thus maximising the firm value. In addition, Musallam (2015) stated that FOR has a strong monitoring of managers and can reduce agency costs, providing a wealth of experience in dealing with managerial opportunism.

Board Gender Diversity and Firm's Financial Performance

The fourth (4th) objective of the study is to investigate the relationship between board gender diversity (BGD) and the firm's financial performance (FFP) of Malaysian public-listed companies. The data analysis results show no significant relationship between GOV and FFP based on accounting-based measurement that uses Return on Assets as the dependent variable. However, a significant relationship is based on a market-based measurement that uses Tobin's Q as DV. This result is supported by Low et al. (2015), who investigated Asian firms in Malaysia, South Korea, Hong Kong, and Singapore. It is found that the appointment of female directors can positively affect the return on investments of the firms by using Tobin's Q as DV.

In contrast, Rose (2007) showed that board gender diversity did not influence the performance of listed Danish firms from 1998 to 2001 as measured by ROA. Similarly, Carter et al. (2010) reported an insignificant relationship between female directors and firm performance for S&P 500 index firms from 1998 until 2002arte

CEO's Financial Expertise and Firm's Financial Performance

The fifth (5th) objective of the study is to investigate the relationship between the CEO's financial expertise (FAM) and the firm's financial performance (FFP) of Malaysian public-listed companies. The result of the data analysis shows that there is no significant relationship between FAM and FFP based on both ABM and MBM. It can be concluded that CEOs with and without professional certification have equal opportunity to make better FFP (Ahmed Haji, 2015). Evidence from the FFP of the lowest of the sample companies is achieved by companies that do not have CEOs with advanced education. However, the highest-performing firm is also performed by companies without CEOs with superior knowledge (Baatwah et al., 2015).

Limitations and future research

Limitations of the study

Malaysia faced economic uncertainty during the period of research. Some companies' performance is unstable and sometimes gain and sometimes in a loss position. The researcher must find the most accurate data, as this paper uses secondary data. This data is derived from the Annual Report. A collection of data requires high time consumption. More time was consumed to manually collect the financial statements and annual reports data. Thus, the sample size is small due to the limited time to complete this study within 4 months.

Future Research

Despite the limitations, this study could bring further opportunities for future research. The first suggestion is that future research should add more ownership structure categories as independent variables, including managerial ownership, management ownership, cross-ownership, director ownership, insider ownership, institutional ownership, concentrated ownership, group ownership, and state ownership. Thus, better trends or patterns of ownership structures could be observed over the period.

In this study, only three variables are examined. Other factors that have not been considered in this study could influence FFP. Therefore, future studies can extend this study by including other factors influencing FFP. In previous research, some corporate governance components were analysed together with the ownership structures.

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ANTECEDENTS OF EXPORT PERFORMANCE DURING POST-COVID19: RESEARCH PROPOSITIONS FROM CHINESE SMALL AND MEDIUM-SIZED ENTERPRISES

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ABSTRACT

Post-COVID-19 has brought many challenges for small and medium enterprises (SMEs) in this specific situation. This paper considered the innovation capability and technical capability of SMEs in China. Furthermore, the previous research does not highlight factors contributing to improving export performance. We found that most SMEs have been affected economically by the lockdown and movement restrictions, especially COVID-19. To survive or improve the SME's export performance to emerge after COVID-19, it is important to build up innovation and technical capability after the turbulent period. Therefore, this article explores the antecedent factors affecting export performance in small and medium enterprises to achieve better performance. Drawing on relevant references and literature, this study employs dynamic capability theory to provide a valuable account of the factors and propositions contributing to improved export performance. In conclusion, this study offers guidelines for managing export activities in small and medium enterprises as they navigate global challenges.

Keywords: Export performance, small and medium-sized enterprises, innovation capability, technical capability

INTRODUCTION

Small and medium-sized firms (SMEs) are crucial contributors to the national economy, as they play a pivotal role in enhancing labour productivity, fostering job growth, reducing income disparities, and fostering market competitiveness (Agyapong, 2010; Gherghina et al., 2020; Xiarewana & Civelek, 2020). In the 1980s and 1990s, China developed the idea of "grasping the big and letting go of the small". As a result, small and medium-sized enterprises benefited from the rapid development of marketisation and globalisation dividends. However, the ongoing COVID-19 epidemic is a significant crisis for small businesses. Small and medium-sized enterprises are facing unprecedented operating pressures, which has triggered the closure of the SME markets, manufacturers, suppliers and customer service unable to interact directly. Moreover, some SMEs cannot resist risks, such as information barriers, inadequate funding, insufficient resources, complex distribution processes and lack of necessary market positioning in foreign markets (Gupta & Singh, 2022; Samiee & Chirapanda, 2019), which led to subpar export performance (Nakos et al., 2019), even close down in the short term (Parilla et al., 2020). Therefore, from the perspective of long-term development and strategy, the improvement of the innovation capacity and technological capacity of SMEs can help promote structural change in developing countries and support the international competitiveness of SMEs has been effectively confirmed (Etuk et al., 2014; Wu & Parkvithee, 2017).

SMEs in China significantly impact the country's economic growth and global trade (Kaftan et al., 2023). Their ability to adapt, seize opportunities, and remain resilient has been crucial in navigating the post-pandemic landscape. However, the aftermath of the pandemic has brought about changes in the business environment, highlighting the need to reassess the factors that affect export performance. Government policies also play an essential role in enterprises' development and positively impact the national economy. These policies are essential for SMEs because they have resource constraints, especially when competing with larger, more experienced companies in international markets (Jasra et al., 2011). Despite facing numerous constraints in resources, skills, and a lack of international experience, it is not uncommon for SMEs to venture into international markets (Ayob & Freixanet, 2014). In such cases, government support becomes crucial for these SMEs to overcome their limitations and effectively compete in international markets. As an illustration, since 2018, the state has prioritised the growth of SMEs by offering innovation incentives, tax incentives, and financial support to private SMEs (Durst & Gerstlberger, 2020; Hong et al., 2016; Xiang et al., 2021). China is the largest economy in Asia, and small and medium-sized enterprises have played an important role in promoting the development of RCEP regional trade. By 2022, China's imports and exports, with the other 14 RCEP members, are projected to reach 12.95 trillion yuan, reflecting a 7.5% increase. This accounts for 30.8% of China's total foreign trade import and export value. The simplified customs procedures, improved trade facilitation offered by RCEP, and reduced tariffs on goods trade within the region have enabled Malaysian companies to access a wider market and enhance their participation in regional and global value chains. Consequently, RCEP has become a catalyst for the steady growth of foreign trade, bringing about new growth opportunities (Ministry of Commerce People's Public of China).

Many studies show that innovation capability positively impacts SMEs' export performance (Guan & Ma, 2003; Oura et al., 2016; Hong et al., 2016). Caballero-Morales (2021) states that using Six Sigma and Integrated Methodology can recover strategy for SMEs in emerging economies during the COVID-19 pandemic. Based on the concept of dynamic capabilities, innovation capability is considered a key driver of business growth (Teece et al., 2012, 2014). Additionally, technical capability can provide superior strengthened knowledge, allocate resources, and set barriers to entry for building competitive advantages (Hou et al., 2020; Lawson et al., 2015).

The field of export performance has drawn increasing attention from scholars and managers. Numerous studies have been published on companies' export performance over the past four decades (Guan & Ma, 2003; Kim & Hemmert, 2016; Krammer et al., 2018; Oura et al., 2016; Vicente et al., 2015; Zehir et al., 2015). However, despite these research efforts, studies on the relationship between export performance antecedent variables and export performance outcomes are still fragmented and incomplete (Baierle et al., 2020; Chen et al., 2016; Leonidou et al., 2014). Furthermore, the importance of SMEs' dynamic, innovation, and technical capability in the post-pandemic context has been overlooked. Few studies have addressed the relationship between innovation capability, technical capability and export performance (Krammer et al., 2018; Moreira et al., 2022). If firms need institutional support to improve their competitiveness in foreign markets, SMEs lack the appropriate resources that often rely on institutional support to improve their competitiveness in foreign markets (Krammer et al., 2018).

Additionally, with the advent of the post-pandemic era and the increasing globalisation of trade, 80% of the companies surveyed had not resumed operations at the time of the survey on February 10, 2020, and 40% could not determine a timetable for resuming operations, 20% of the companies surveyed were unable to survive more than a month on a cash-flow basis, presenting SMEs going lockdown in an extended pandemic scenario (Dai et al., 2020). Furthermore, the barriers to business operations vary across the supply chain, with upstream firms mainly affected by labour shortages while downstream firms face more stern challenges related to the supply chain (Ma et al., 2021). Hence, it is urgent to study how to enable SMEs to survive and maintain competitiveness in the particular period after the epidemic.

By addressing these issues, this study makes three main contributions. First, unlike previous studies focusing on the development or existence of dynamic capabilities, we provide a clearer understanding of utilising processes based on coordinating capabilities. Specifically, our conceptual model of the impact of innovation and technical capabilities is based on dynamic capabilities. We integrate the perspective of enterprises' dynamic capabilities and maintain SMEs' export performance after the pandemic by improving innovation and technical capabilities. Second, we outline how SMEs can maintain export performance in the post-pandemic era, as assessed by innovative and technical capabilities. Our theory holds that in the changing environment, the innovation behaviour of enterprises and the improvement of R&D technology provide a favourable basis for ensuring the survival of enterprises. Third, we provide specific practical insights on the impact of dynamic capabilities and their role in integrating marketing and technology capabilities. Dynamic capabilities and their effects are difficult to measure (Easterby-Smith et al., 2009). Our findings provide new insights into the export performance of Chinese SMEs. Specifically, firms benefit most from using dynamic capabilities and focusing on export performance in a post-pandemic environment.

In the next section, we describe the theoretical background and previous research on export performance. Then, in presenting our research approach, we present previous empirical research and provide a proposition. At last, we summarise the conclusions and review the implications for future research.

THEORETICAL BACKGROUND

Dynamic Capabilities Theory

Dynamic capability is the ability of an enterprise to integrate, construct, and re-allocate internal and external resources to respond to a rapidly changing environment (Teece, 2007). Dynamic capabilities can provide enterprises with the ability to respond in a timely and effective manner to environmental changes and significantly impact the level of internationalisation and performance of enterprises (Li, 2015; Prange & Verdier, 2011). In addition, powerful dynamic capabilities can enable enterprises to gain strong competitiveness at any time (Teece, 2012). A large and growing body of scholars focuses on the relationship between dynamic capabilities and enterprise performance. However, it is worth noting that scholars have not formed a unified view on whether dynamic capabilities can improve performance (El et al., 2020; Schilke et al., 2018).

In this paper, we pointed out that dynamic capabilities apply innovation and technical capability to improve export performance. Innovation capability directly affects whether an enterprise's international production and sales can successfully match the differentiated demand preferences of the target market. SMEs with stronger innovation capability can become an exporter by improving their productivity level and breaking through the fixed cost of exporting, thereby promoting export performance (Wang & Ahmed, 2007).

LITERATURE REVIEW

The pandemic and SMEs

The impact of the COVID-19 pandemic on small and medium-sized enterprises (SMEs) has been extensively studied in the literature. In China, SMEs faced numerous challenges due to the pandemic, including lockdowns, movement restrictions, and disruptions in supply chains (Alam et al., 2021; Zahoor et al., 2022). Ma et al. (2021) conducted a study that sheds light on the difficult circumstances experienced by Chinese SMEs. Their findings reveal a concerning reality: In 2020, 80% of the surveyed companies had not yet resumed operations, with 40% uncertain about when they would be able to do so. Furthermore, 20% of the companies were on the brink of viability, relying on limited cash-flow reserves that would only sustain them for a month. This paints a bleak picture for SMEs facing the possibility of prolonged lockdowns (Assefa, 2023; Klein & Todesco, 2021).

In response to the seismic upheaval, small and medium-sized enterprises (SMEs) have shown remarkable resilience by devising strategies to survive and maintain competitiveness. Noteworthy among these strategic adaptations is the use of online platforms, with Tmall as a prime exemplar. These platforms have emerged as pivotal enablers, offering SMEs a mechanism to mitigate certain risks by optimising their supply chains and the deployment of intelligent machines to expedite production while concurrently minimising labour costs (Jantunen, 2005). This strategic dexterity underscores SMEs' adaptability in embracing digital solutions as essential tools for surmounting the formidable challenges wrought by the pandemic.

However, beyond this operational pivot lies a profound evolution in the relationship between manufacturers and consumers, catalysed by the pandemic. Within the intricate framework of the supply chain, a symbiotic interplay is becoming increasingly pronounced. Manufacturers, keen to align with evolving market demands and enhance their products, draw invaluable insights from the consumer experience. Simultaneously, consumers, their preferences swayed by the technological prowess and innovation capabilities of manufacturers, contribute to a dynamic feedback loop that invigorates the R&D potential of manufacturers, creating a mutually beneficial cycle (Aw, Chung, & Roberts, 2012).

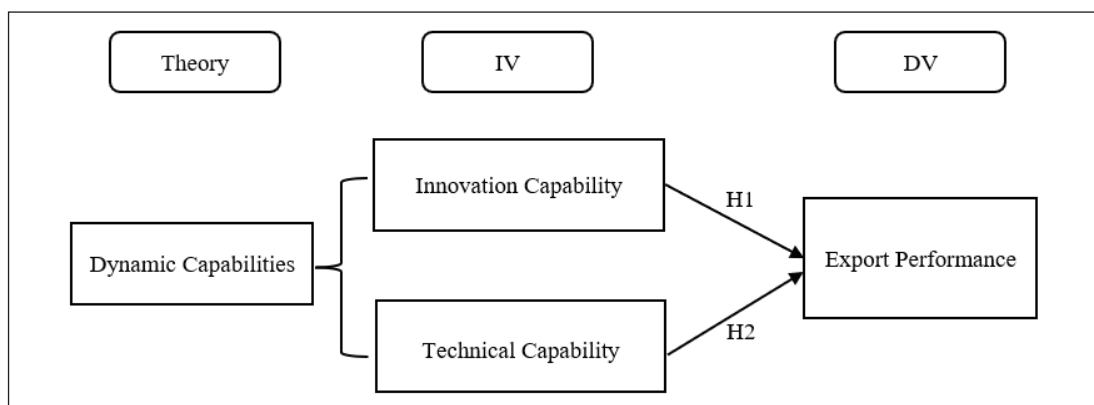
Export performance

Export performance is the outcome of firms' export activities, which are increasingly important as companies worldwide strive to serve international markets to their fullest extent. For some SMEs, exporting is a means to reduce risk and expedite entry into international markets (Poturak & Duman, 2014). Extensive literature demonstrates a correlation between export performance. However, measuring export performance is complex, as it can be conceptualised and manipulated in various ways. Commonly used indicators to measure export performance include export sales, profits, and satisfaction with performance (Poturak & Duman, 2014).

Despite existing research on export performance, there is still scope and fragmentation for theoretical and practical significance. Global trade and commerce depend on the export of services and the expansion of international markets, and export issues have always been important (Zhang & Jedin, 2022, 2023).

Figure 1

Conceptual Model of the Study of Export Performance



Export performance is a sign of a company's success and is one of the indicators of economic growth to ensure the company's sustainable development (Zehir et al., 2015). According to Zhang et al. (2009), the export performance of a company is affected by product innovation. Products must meet the needs of the local market to achieve better performance. Accordingly, Kolbe et al. (2021) indicate that innovation capability and reactive market orientation are drivers of export performance in Latin American SMEs. Therefore, innovative products must be innovated to gratify market needs and shorten product cycles.

When companies conduct international marketing, they will run into unavoidable problems. For instance, consumption habits, technical standards, cultural customs, and product patents in foreign markets differ from those in China. In addition, innovation determines the technological advantage of an enterprise and, therefore, affects the export performance of this enterprise. Technical capabilities have effectively enhanced product quality, improved product performance, and reduced production costs. According to Aw et al. (2012), it is found that compared with China's local market, some companies with stronger competitiveness tend to choose export markets with more opportunities to survive in fierce market competition. Therefore, the technical capabilities of such export companies are also stronger.

Guan and Ma (2003) pointed out that the company's technological capabilities should penetrate the overall capability integration except for innovation capabilities. At the same time, the company will also obtain sustainable international competitiveness. The technological capacity input can reduce the dependence on imports. On the other hand, insufficient technology will lead to a decline in product advantages, product competitiveness, and, ultimately, a decline in export rates (Bessant & Buckingham, 1993; Guan & Yu, 1998; Guan & Ma, 2003).

Lefebvre et al. (1998) research results show that the R&D intensity of a company has no significant impact on export performance; however, regarding technical capabilities, such as the proportion of employees with a scientific and technological background, R&D collaboration with external partners, and the importance attached to the company's technical capabilities and external laboratory. Surprisingly, research on export performance, especially in the post-pandemic context, is limited research on innovative marketing models for post-covid-19. Thus, we took a specific perspective on export performance.

The antecedents affecting export performance and propositions

This study explores the relationship between antecedents and export performance and finds the most influential factors in Chinese export SMEs. Hence, we follow Martins and Terblanche (2003) and Hong and Hartley (2011) in this study. We propose two main antecedents for export performance: namely, innovation capability and technical capability.

Innovation Capability

Jantunen (2005) proposes that innovation capability is the ability of an enterprise to create new ideas to develop its products, services and processes. As a result, the enterprise will effectively transform its element resources in the market, thereby improving its internal quality and driving it to obtain more differentiated capabilities from competing enterprises. This diversity is ultimately reflected in the competitive advantage enterprises gain in the market (Ologbo & Nor, 2015). Moreover, improving innovation capability indicates improving enterprise competitiveness (Uyar & Oralhan, 2017). Therefore, the level of innovation ability is directly related to the competitiveness of an enterprise (Ferreira et al., 2020). Uyar and Oralhan (2017) state that high innovation ability can provide the market with high-performance, latest, high-quality, and lower-cost products than competitors.

Enterprise innovation capability directly determines the level of firm performance that the company takes to create value for the enterprise (Yam et al., 2011). Similarly, the enterprise needs to maintain its competitive advantage in a dynamic and complex market environment (Shan et al., 2019). According to Jaworski and Kohli (1993), highly competitive market conditions require considerable innovativeness to meet international customer needs. Once SMEs overcome the export hurdle, managerial education in the sense of ensuring employee engagement in innovation and export has a positive effect on exporting (Ganotakis & Love, 2012; Love & Roper, 2015). The innovation capability dimension of know-how development has been found to have a positive effect on the financial performance of SMEs (Saunila, 2020). Likewise, Lee et al. (2014) showed that innovativeness positively affects firm performance for emerging-market SMEs. Based on a survey conducted by the Guangdong Association for the Promotion of Small and Medium-Sized Enterprises, it

was found that 52% of small and medium-sized manufacturing enterprises hold the belief that the pandemic during the initial half of the year had a more pronounced influence on their company operations compared to the previous year. However, regardless of the circumstances, they exhibited no signs of laziness. For instance, despite being closed for three months, Poetic Flower Factory remained steadfast in its decision to refrain from outsourcing production, aiming to uphold superior quality standards. Although the physical store incurred damages, the business managed to cultivate new avenues of growth through online platforms. Similarly, in response to the challenges posed by the epidemic, the underwear brand Curiosity Miss proactively enhanced its supply chain optimisation efforts, thereby ensuring stability within the organisation.

Based on the dynamic capability theory, this paper considers innovation capability an antecedent affecting export performance. Therefore, we set the proposition in the context:

P1: The greater the innovation capability, the better the export performance.

Technical Capability

According to Likoum et al. (2020), "technical capability" refers to a resource and how it is turned into a commercial activity that may be utilised as a competitive advantage or exploited for improved corporate performance. Technical competence includes related skills in the process and product technology processing. This study concentrates on new product development from a research perspective. New product development is no longer the individual behaviour of the manufacturer. However, it needs to integrate the advantages of manufacturers, customers and other stakeholders to achieve first-class product development goals.

In recent years, more and more manufacturers have participated in researching and developing new products, making the company consider further improving manufacturers' product design capabilities. Manufacturers play an essential role in assisting companies in achieving new product development goals (Huang et al., 2015). Awan et al. (2022) focused on determining which management capabilities should be used by decision-makers in enterprises to successfully integrate manufacturers into their new product development projects and achieve excellent product innovation. From the perspective of customer use, manufacturers are more familiar with their equipment performance and processing technology at the design stage and can consider various factors that affect efficiency and quality at the design stage. Hence, unnecessary rework is avoided while the result is more conducive to reducing processing costs. Accordingly, Maletič (2016) noted that the stronger the technical capability, the higher the performance. The stronger the manufacturing participation behaviour, the better the performance of new product development, and it will effectively promote the competitiveness of the new product market. Similarly, previous studies have analysed the relationship between technical capabilities and export performance and found positive correlations (Krammer, 2018; Oura et al., 2016). Studies also suggest that technical capability enhances product development and offers competitive advantages (Yan et al., 2017).

Adopting new technologies will assist companies in developing new products, effectively carrying out technology diffusion, and gaining technical leadership and excess profits (Wu & Liu, 2016; Wu et al., 2018). Especially after the epidemic, small and medium-sized enterprises have suffered setbacks. However, with the help of online platforms like Tmall, they can resist some risks. For example, in the past two years, SMEs have established that supply chain optimisation is carried out with the help of external forces. SMEs cooperated with intelligent machines to speed up production and reduce labour costs. Surprisingly, we found that manufacturers and consumers complement each other. The supply chain capabilities accumulated by manufacturers can support the user experience of consumers; the brand potential energy accumulated by consumers will feed back the R&D capabilities of manufacturers and maintain the performance (Ferreira & Coelho, 2020). In other words, technology may be more than merely an organisational resource; it can be a vital and distinctive dynamic capability (Reuber & Fischer, 2011). Previous studies have analysed

the relationship between technical capabilities and export performance and found positive correlations (Athreye & Kapur, 2015; Jer, 2014; Zheng & Zhang, 2018). Therefore, this study continuously learns and creates new items from a technical capability standpoint. In the light of this, the proposition we take as follows:

P2: The higher the efficiency of technical capability, the better export performance.

CONCLUSION

This paper set out to advance our understanding of the antecedents affecting export performance in small and medium-sized enterprises (SMEs) in China, specifically focusing on innovation capability and technical capability in the post-pandemic era. Our findings shed light on the crucial role of these dynamic capabilities in driving SMEs' export performance during and after the COVID-19 pandemic. However, due to their vulnerability, SMEs are more susceptible to external shocks, such as liquidity crises, as seen during the COVID-19 pandemic. To mitigate the negative impact of the epidemic, it is important to enhance innovation and technical capabilities, particularly in high-tech and digital sectors. The paper also highlights the significance of innovation and technical capabilities for the sustainable development of SMEs. The primary objective of this research is to provide insights into the post-COVID-19 export performance and offer recommendations for businesses to enhance their resilience against risks. The economic recovery heavily relies on the healthy growth of small and medium-sized enterprises, a key concern for China's economic development during the epidemic. Therefore, making scientifically informed decisions based on thorough analysis and evaluation of objective facts is paramount.

Based on empirical evidence and conceptual model, the research findings suggest several implications for Chinese SMEs and policymakers. Firstly, it is recommended that SMEs embrace digitalisation and advanced technologies to optimise production processes and enhance product quality. Secondly, governments can play a crucial role by incentivising SMEs to adopt digital technologies and providing training and resources for upskilling. Additionally, incorporating qualitative methods can provide a richer understanding of how SMEs develop and leverage dynamic capabilities in response to post-pandemic challenges. In-depth interviews and case studies can capture insights into SMEs' strategies and decision-making processes. Lastly, SMEs should integrate sustainability and corporate social responsibility (CSR) practices into their business strategies to enhance their reputation and competitiveness in international markets.

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THE MODERATING ROLE OF TECHNOLOGICAL ORIENTATION IN THE RELATIONSHIP BETWEEN ENTREPRENEURIAL ORIENTATIONS AND SMES PERFORMANCE

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ABSTRACT

Although extant empirical research agrees on the role of entrepreneurial orientation in improving SMEs performance, there are limited studies on integrating technological orientation and entrepreneurial orientation in a single model to improve performance. This paper investigates how technological orientation moderates the effect of entrepreneurial orientation dimension (innovativeness, proactiveness and risk-taking) on SMEs performance. The study employed a cross-sectional survey design. A simple random sampling technique was used to select the sample 272 out of the population of 457 SMEs operating within the Kaduna Metropolis. The Statistical Package for Social Science (SPSS) and Partial Least Squares Structural Equation Modeling (PLS-SEM) were used to analyse the data. Findings revealed that innovativeness, proactiveness and risk-taking were positively and significantly related to SMEs performance. It further revealed that technological orientation moderated the effect of proactiveness, risk-taking and SME performance, while innovativeness did not. It is recommended that SMEs should take proactive action and risk in implementing new technology that best improves their business performance.

Keywords: Entrepreneurial orientation, technological orientation, SMEs performance.

INTRODUCTION

Recently, the performance and contributions of Small and Medium Enterprise (SMEs) have created much attention among various researchers and policymakers. This is because it plays a fundamental role in poverty reduction, employment creation and the country's gross domestic product (GDP) (Aminu & Shariff, 2015). For example, SMEs in developing countries like China contribute 80% of the total employment and 60% of the Chinese GDP (Chinese National Bureau of Statistics, 2017), and 80% of employment and 70% of GDP in Ghana (Sa'id et al., 2019). Similarly, SMEs in Nigeria contribute to about 39.5% of employment and 8.89% of GDP (Small and Medium Enterprises Development Association of Nigeria [SMEDAN], (2017). This amount is minimal compared to other developing countries like China and Ghana.

Also, the issue of the small performance of SMEs made the Nigerian government come up with various initiatives and programmes. For example, the creation of SMEDAN in 2003; Microfinance Institutions (MFIs) in 2005; Youth Enterprise with Innovation in Nigeria (YOU-WIN) in 2011; Development Bank of Nigeria (DBN) in 2014; Government Enterprise and Empowerment Programme (GEEP) in 2016; Agric-Business Small and Medium Enterprise Investment Scheme (AGSMEIS) in 2017 and the most recent is Micro Small and Medium Enterprises Survival Fund (MSMESF) in 2020.

Despite the above initiatives and programmes, SMEs performance in Nigeria still needs to grow. Many empirical studies on entrepreneurship acknowledged the importance of Entrepreneurial Orientation (EO) in predicting firms' performance. Some studies examined the direct and interaction effect of EO dimension and SMEs performance. For example, looking at the direct relationship, studies (e.g., Shafer & Ali, 2020; Aminu, 2016) found the relationship to be significant, while others (e.g., Olubiyi, Egwakhe, Amos & Ajayi, 2019; Innocent et al., 2018; Sorayah et al., 2017) found an insignificant link between EO dimension and SMEs performance.

Following the argument provided by Baron and Kenny (1986) on including a moderator to strengthen the inconsistencies in the previous literature, the researcher introduced technological TO with the possibility of enhancing the discrepancies between the EO dimension and SMEs performance. This is in line with the suggestion of Shafer and Ali (2020), who examined EO's effect on SMEs' innovation performance under the mediation of learning orientation and suggested the need for future research to consider TO as a moderating variable on EO and SME performance relationship. This paper aims to investigate the relationship between the dimensions of EO (innovativeness, proactiveness and risk-taking) to address this theoretical gap in SMEs performance and determine TO's moderating effect on the above relationships.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Entrepreneurial Orientation and SMEs Performance

Entrepreneurial orientation (EO) has generated critical conceptual and empirical attention in entrepreneurship literature. According to Miller (1983), EO constitutes three main components (i.e., innovativeness, pro-activeness and risk-taking). They claimed that EO is a strategy that focuses on product market innovation and project risks and has a proclivity to outperform competitors in terms of innovation and excellence. In this regard, some scholars have put effort into defining the concept of EO. For example, Covin and Slevin (1989) defined EO as a concurrent presentation of firm activity based on risk-taking, innovation, and proactiveness. They also document that such EO dimensions identified by Miller (1983) are critical to the firm performance. This, therefore, brings the need to investigate the individual effect of each of the dimensions of EO on firm performance.

Innovativeness and SME Performance

Innovativeness is the first dimension of EO (Miller, 1983). It refers to the ability of a business enterprise to enhance or come up with a new idea, creative processes, and new technology (Lyon et al., 2000). Innovativeness can come in a variety of ways. It may be new to the world or in a given context (Tee, 2016). Some previous studies (Khurram et al., 2017; Aminu, 2016) established a positive and significant influence between innovativeness and SMEs performance. Others found that innovativeness and SME performance have a negative and insignificant relationship (Olubiyi et al., 2019; Innocent et al., 2018). In the light of these, the following null hypothesis is formulated;

H_{01} : Innovativeness does not affect SMEs performance

Proactiveness and SMEs Performance

Proactiveness is another dimension of EO. It refers to the tendency for enterprises to take a positive marketing strategy, proactive action, and leading strategy to introduce new products, processes, technologies, and services to transcend competitors (Zhai et al., 2017). According to Rauch, Wiklund, Lumpkin and Frese (2009), proactiveness measures the firm's entrepreneurship tendency to exploit the market opportunity by initiating new products and services. Past literature (Innocent et al., 2018) posited that proactiveness has a positive and significant effect on SMEs performance. Others, such as (Sorayah et al., 2017), stated that proactiveness has an insignificant effect on SMEs' performance. Based on this, the following null hypothesis is formulated;

H₀₁: Proactiveness does not affect SMEs performance

Risk-taking and SMEs Performance

Risk-taking is the third dimension of EO. It refers to how business firms borrow heavily and invest in opportunities with high returns and high-risk explored markets (Covin & Miller, 2014). More so, entrepreneurs more interested in taking risks, especially in their business activities, will achieve higher performance than their rivals (Miller, 1983). Extant studies documented that risk-taking has a direct, positive and significant link with SMEs performance (Olubiyi et al., 2019; Innocent, Paul & Amaka, 2018; Sorayah et al., 2017). On the other hand, Arisi-Nwugballa et al. (2016) revealed that risk-taking has no link with SMEs performance. Based on the above discussion, the following hypothesis is formulated;

H₀₁: Risk-taking does not affect SMEs performance

Technological Orientation as a Moderator

Technological Orientation (TO) is vital in determining SMEs performance (Naala et al., 2017). According to Gatignon and Xuereb (1997), technological orientation refers to the ability of a business organisation to create a formidable technological structure and use it to develop new products or services. Some scholars (Zhou & Li, 2010) have argued that the higher performance of the firm largely depends on the TO. Aragon and Marin (2005) confirm that technological development and innovation level guide the firm to achieve competitive advantages by creating a set of essential elements for success. In a technology-driven company, innovation and creativity have become the dominant organisational behaviours and principles that guide its operations and initiatives (Li, 2005; Zhou et al., 2005). Therefore, Naala et al. (2017) reported that for small businesses to achieve and sustain competitive advantage, they need TO. Pratono (2016) and Zhou and Li (2010) confirm that TO can improve firm performance. Thus, the present study followed the suggestion of Shaher and Ali (2020) by introducing TO as a moderating variable to strengthen the inconsistencies between EO dimensions and SME performance relationships. In this regard, we formulated the following null hypotheses;

H₀₄: TO does not moderate the effect of innovativeness and SMEs performance

H₀₅: TO does not moderate the effect of proactiveness and SMEs performance

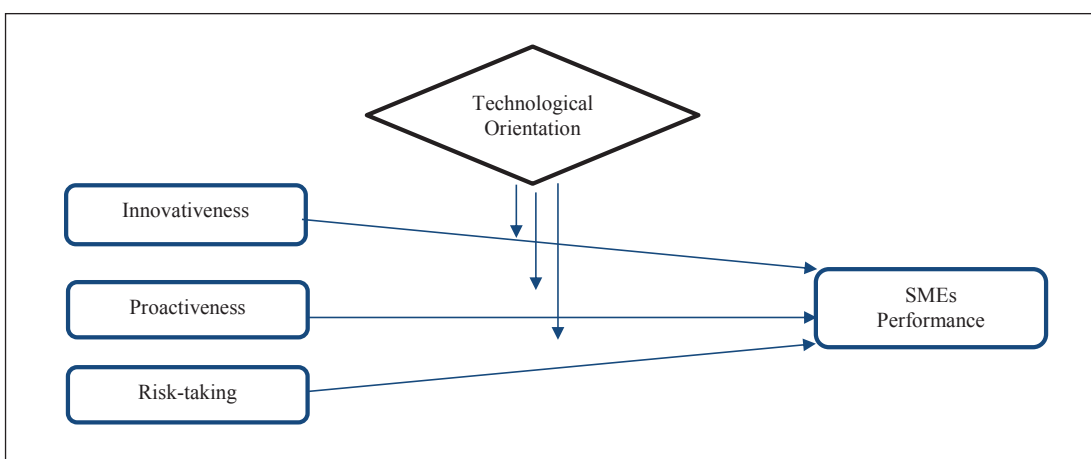
H₀₆: TO does not moderate the effect of risk-taking and SMEs performance

Conceptual and Theoretical Framework

The conceptual framework of this study was developed from a review of the literature specifically to investigate the moderating effect of TO on the effect of EO and SMEs performance. Thus, the framework is expressed below.

Figure 1

Conceptual Framework



The resource-based view (RBV) theory of Barney (1991) was used to explain the relationship in the above framework. The theory assumes that if all firms within an industry have homogeneous resources, they can only sustain a competitive advantage. According to Barney (1991), a firm's principal source of long-term competitive advantage is its heterogeneous and immobile resources that are valued, rare, inimitable, and non-substitutable (VRIN). Therefore, the present study used the RBV theory (Barney, 1991) to explain EO and TO, regarded as intangible resources that are VRIN to improve firms' performance.

METHODOLOGY AND MEASURES

The study employed a positivist research paradigm and quantitative research approach since the objective of this study is hypothesis testing. Also, a cross-sectional survey design was employed to collect data. The study population constitutes four hundred and fifty-seven (457) registered SMEs operating in Kaduna Metropolis (KADCCIMA, 2019). Dillman's (2014) sample size formula was used to get a sample size of 209 from the population. Similarly, 30 per cent of the computed sample size was increased to reduce sample size error and address the non-response problem, as recommended by Israel (2013). Thus, 63 respondents were added to the calculated sample size of 209, and the new sample is 272. MS Excel 2013 (RAND) used a simple random selection procedure to select the sample (Saunders et al., 2009).

The measurement of each construct of this study was rooted in diverse sources. SMEs performance was measured by six (6) items adapted from Suliyanto and Rahab (2012). Similarly, EO was measured by eight (8) items adopted from Covin and Slevin (1989). Finally, TO was measured by ten (10) items adopted from Gatignon and Xuereb (1997). All of the study's variables were assessed using a five-point Likert scale with options ranging from "1" Strongly Agree (SA) to "5" Strongly Disagree (SD)

Data Preparation and Analysis

The owners-managers of SMEs were given 272 questionnaires in this study. Two hundred twenty-four questionnaires were returned out of that total. However, 12 surveys had an unengaged response. Thus, they were all removed, bringing the total number of questionnaires to 212 for analysis. In addition, 30 cases were discovered with fewer than 10% missing values when looking for missing data and were discarded based on Hair, Black, Babin, and Anderson's recommendations (2014). The mean substitution method was utilised to fill in the missing data (Tabachnick & Fidell, 2007; Hair et al., 2014). The researchers employed 212 questionnaires in total for their final study. The study used SmartPLS version 3.0 to calculate the measurement and structural model (Anderson & Gerbing, 1988). Some advantages of employing PLS are as follows: At the same time, it may estimate the links between variables and indicators and their link with other variables. It uses a bootstrapping approach to generate statistically reliable estimates of interaction effects, which may lower the potential relationship while boosting the theory's validity (Allard et al., 2016; Hair et al., 2014).

Measurement Model Results

According to Hair et al. (2019), the measurement model evaluation begins with the size and significance of the loadings, reliabilities, and then convergent and discriminant validity. According to Hair et al. (2017), the average variance extracted is 0.5 and composite reliability is 0.7, while the indicator reliability depends on what improves the AVE or CR. Therefore, figure 2 and Table 1 below present the validity and reliability results.

Figure 2

Measurement Model

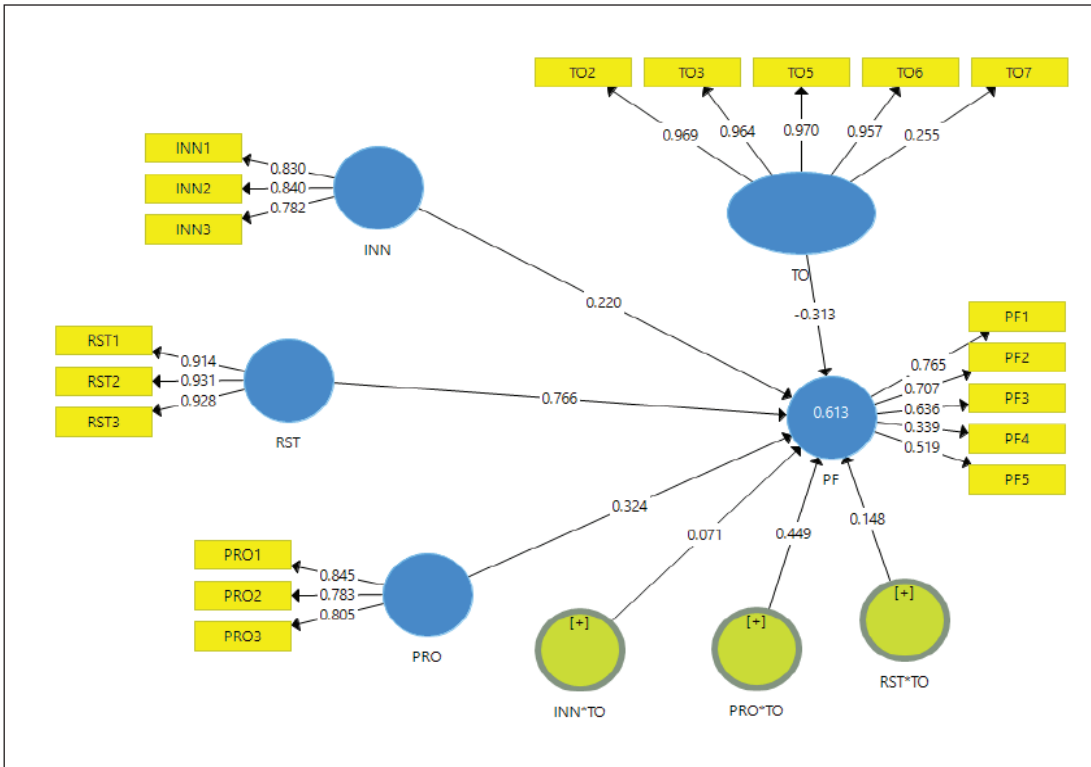


Table 1

Internal Consistency Reliability and Convergent Validity for Reflective Construct

Constructs	Item	Loading	AVE	CR			
Innovativeness	INN1	0.830	0.668	0.858			
	INN2	0.840					
	INN3	0.782					
Proactiveness	PRO1	0.845	0.659	0.853			
	PRO2	0.783					
	PRO3	0.805					
Risk-taking	RST1	0.914	0.854	0.946			
	RST2	0.931					
	RST3	0.928					
Technological Orientation	TO2	0.969	0.758	0.933			
	TO3	0.964					
	TO5	0.970					
	TO6	0.957					
	TO7	0.255					
	Firm Performance	FP1			0.765	0.735	0.738
	FP2	0.707					
FP3	0.636						
FP4	0.339						
FP5	0.519						

Note:INN=Innovativeness, PRO=Proactiveness, RST=Risk-taking, and TO=Technological Orientation

AVE= Average Variance Extracted and CR = Composite Reliability

As revealed in Table 1 above, the indicator reliability was achieved for all the constructs because deleting any item will not increase the AVE or the CR, as suggested by (Hair et al., 2017). Also, the AVE values of all the constructs range from 0.659 to 0.854, with consistent composite reliability values also ranging from 0.738 to 0.946, which interprets that the items employed in the study measure the constructs and show attainment of convergent validity. Therefore, indicator loadings, AVE and CR in this study are achieved as recommended by Hair et al. (2017).

Furthermore, to determine the discriminant validity, Duarte and Amaro (2018) proposed using the Heterotrait-Monotrait Ratio (HTMT) method as the best for evaluating discriminant validity compared to the Fornell-Larcker criterion and cross-loading. Therefore, the recommended thresholds of HTMT value should be 0.85, 0.9 or 1 (Hair et al., 2017; Henseler et al., 2015; Kline, 2011). Thus, the discriminant validity of this study was achieved, as indicated in Table 2, that all the values are below the recommended thresholds.

Table 2

Discriminant Validity (Heterotrait-Monotrait Ratio (HTMT) (n=212)

Constructs	INN	INN*TO	PF	PRO	PRO*TO	RST	RST*TO	TO
INN								
INN*TO	0.102							
PF	0.724	0.376						
PRO	0.581	0.037	0.869					
PRO*TO	0.386	0.528	0.302	0.151				
RST	0.773	0.339	0.576	0.625	0.731			
RST*TO	0.065	0.202	0.270	0.214	0.249	0.125		
TO	0.720	0.452	0.451	0.564	0.792	0.992	0.192	

Note: INN=Innovativeness, PRO=Proactiveness, RST=Risk-taking, and TO=Technological Orientation

Structural Model Results

After successfully validating the instruments in the measurement model, the next is to assess the structural model by applying the bootstrapping technique with 5,000 samples to ascertain the significance levels of the direct and moderating relationships (Hair et al., 2017). These include the hypotheses testing, evaluation of R-square, effect size and predictive relevance.

Figure 3

Bootstrapping for Direct and Moderation

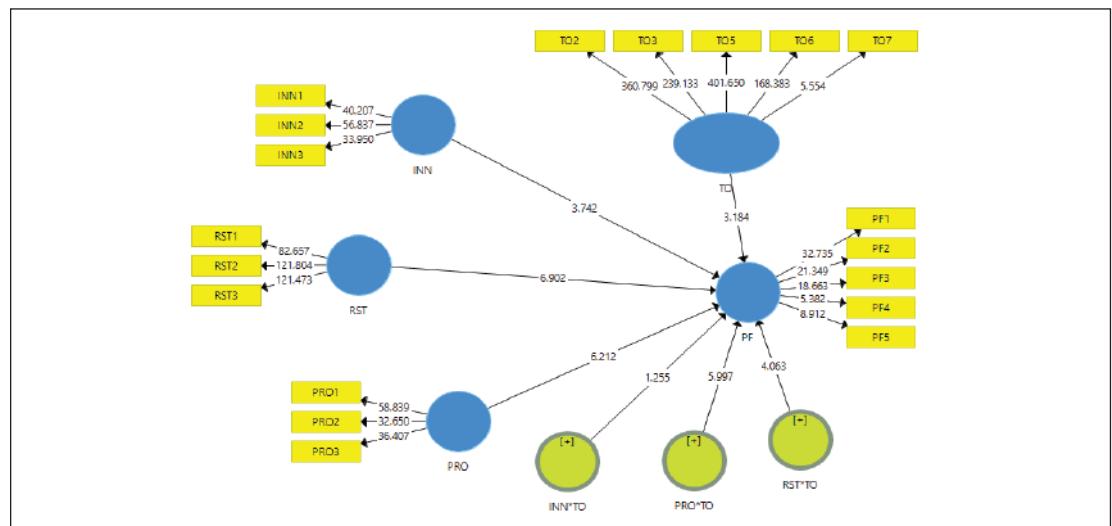


Table 3*Path Coefficient for Direct and Moderation Relationships*

Hypothesis	Relationship	Beta	Standard Deviation	t-value	p-values	Decision	Confidence Interval	
							2.5%	97.5%
H ₀₁	INN -> PF	0.220	0.059	3.742	0.000	Rejected	0.101	0.330
H ₀₂	INN*TO -> PF	0.071	0.056	1.255	0.210	Accepted	-0.040	0.184
H ₀₃	PRO -> PF	0.324	0.052	6.212	0.000	Rejected	0.211	0.424
H ₀₄	PRO*TO -> PF	0.449	0.075	5.997	0.000	Rejected	0.303	0.594
H ₀₅	RST -> PF	0.766	0.111	6.902	0.000	Rejected	0.541	0.975
H ₀₆	RST*TO -> PF	0.148	0.036	4.063	0.000	Rejected	0.076	0.219

Note:INN=Innovativeness, PRO=Proactiveness, RST=Risk-taking, and TO=Technological Orientation

Table 3 above presents the results of the direct and moderation relationships of the study. Specifically, the finding for the direct relationship between INN -> PF, PRO -> PF and RST -> PF revealed a positive and significant with ($\beta = 0.220$ and $P=0.000$), ($\beta = 0.324$ and $P=0.000$) and ($\beta = 0.766$ and $P=0.000$) respectively. This provides the basis for rejecting all the direct relationship null hypotheses (H₀₁, H₀₃ and H₀₅). Equally, the finding of the moderation relationship between PRO*TO -> PF and RST*TO -> PF demonstrated a positive and significant with ($\beta = 0.449$ and $P = 0.000$) and ($\beta = 0.148$ and $P = 0.000$). The result also provides evidence of rejecting the null hypotheses H₀₄ and H₀₆. On the other hand, the moderation relationship between INN*TO -> PF reported a positive and insignificant with ($\beta = 0.071$ and $P = 0.210$), thus producing the basis for accepting the null hypothesis H₀₂.

To further understand whether a path coefficient is significantly different from zero, Hair et al. (2017) stated the importance of reporting bootstrap confidence interval, which provides additional information on the stability of a coefficient estimate at a 2.5% lower level (LL) and 97.5% upper level (UL). As presented in Table 3, there is no zero between the confidence intervals of the significantly rejected null hypotheses except the accepted null hypothesis. To sum up, TO moderates the effect of PRO, RST and SME performance, while INN and SME performance do not.

The coefficient of determination (R²) of endogenous constructs is another criterion for evaluating structural models (Hair et al., 2017). The R² values of 0.19, 0.33, and 0.67 are considered weak, moderate, and substantial (Chin, 1998).

Table 4*Coefficient of Determination (R2) for direct and Moderation Relationships*

Construct	R-Square (R ²)
SMEs Performance	0.613 (61.3%)

As presented in Table 4 above, the cumulative result of the exogenous construct (entrepreneurial orientation) and the moderator (technological orientation) explains 60.1% of the total variance on the endogenous construct (SMEs performance). Following Chin's (1998) recommendations, the R-squared (R²) value explained by these exogenous constructs and the moderator on the endogenous construct (SMEs performance) is moderate.

After determining the coefficient of determination (R²), the next step is determining the effect size (f²). The f² value provides an overview of a particular exogenous variable's potential effect or impact on the endogenous variable. Keny (2016) proposed that 0.005, 0.010 and 0.025 are more realistic thresholds for small, medium, and large effect sizes.

Table 5

Effect Size for Direct and Moderation Relationships: F-Square

Constructs	F ²	Effect Size
INN	0.061	Large
INN*TO	0.005	Small
PRO	0.158	Large
PRO*TO	0.099	Large
RST	0.180	Large
RST*TO	0.037	Large

Note: INN=Innovativeness, PRO=Proactiveness, RST=Risk-taking, and TO=Technological Orientation

Table 5 above shows that INN, PRO and RST have a significant effect size on SMEs performance and the interaction between PRO*TO and RST*TO is found to have an enormous effect on SMEs performance. At the same time, INN*TO exert a small effect on SMEs' performance.

In addition, a blindfolding process was used to assess the results of predictive relevance (Q²). According to Geisser (1974), any model above "0" has predictive relevance; it can predict a relationship and if the value is "0" and below means, the model has no predictive influence.

Table 6

Predictive Relevance for Moderation Relationships: Q-Square

Total	SSO	SSE	1-SSE/SSO
SMEs Performance	2940.000	2573.498	0.125

Note: SSO=Sum of squared observation and SSE=Sum of squared prediction errors

As shown in Table 6, the Q² value for the endogenous latent construct is more than zero (0.125), confirming the model's predictive relevance (Hair et al., 2014; Hayes, 2009; Chin, 1998).

Assessment of the Importance-Performance Matrix Analysis (IPMA)

The Importance-Performance Matrix Analysis (IPMA) compares the overall effects (importance) of the structural model with the average value of the latent variable scores (performance). The goal is to identify antecedents that have a relatively high importance for the target construct but relatively low performance to highlight important areas of improvement that can receive high attention from owner-managers to boost the performance of their SMEs. Therefore, Table 7 presents the result of IPMA.

Table 7*Importance-Performance Matrix Analysis (IPMA)*

Constructs	Importance	Performances
INN	0.154	75.565
PRO	0.269	84.738
RST	0.385	75.026
TO	-0.100	69.949

Note: INN=Innovativeness, PRO=Proactiveness, RST=Risk-taking, and TO=Technological Orientation

As shown in Table 7 above, RST has a higher importance with a value of 0.385, representing 38.5% for the target construct (SMEs performance), but shows a moderate performance with a value of 75.026. Equally, PRO has average importance with a value of 0.269, representing 26.9% for the target construct (SMEs performance), but shows a higher performance with a value of 84.738. Similarly, INN has low importance with a value of 0.154, representing 15.4% for the target construct (SMEs performance), but shows a moderate performance with a value of 75.565. Lastly, TO has a negative and less importance with a value of -0.100, representing -10.0% for the target construct (SMEs performance), but shows a lower performance with a value of 69.949.

DISCUSSION

The study's main goal was to see if TO moderates the link between INN, PRO, RST and SMEs' performance. The study added to the body of knowledge by elucidating how TO interacts with INN, PRO and RST to affect SMEs' performance. The study's findings revealed that INN, PRO and RST positively and significantly affect SMEs' performance. The findings align with extant studies (e.g., Olubiyi et al., 2019; Innocent et al., 2018; Khurram et al., 2017). It also revealed that TO positively and significantly moderated PRO, RST and SMEs' performance, while INN did not. This signifies that the essential prerequisites for driving SMEs' performance depend on the ability of SMEs to take proactive action and risk to implement new technology in their business to achieve higher performance.

THEORETICAL AND PRACTICAL IMPLICATIONS

Theoretically, the study improved our understanding of the interaction of TO with INN, PRO and RST to predict SMEs performance. However, little or no extant study has been found that used TO as a moderating variable for the association of INN, PRO, RST and SMEs' performance. Regarding the practical contributions, the findings of this study will help the management and owners of SMEs, policymakers such as CBN, SMEDAN, and NBS and academic researchers in designing the policies and programs to promote SMEs performance in Nigeria.

LIMITATIONS AND SUGGESTIONS FOR FUTURE STUDY

Several limitations ought to be considered in this study. First, the study adopted a cross-sectional design that captures only responses of data collected over a single period. Therefore, future studies should consider a longitudinal approach that collects data over two or more particular periods. Second, the present study focused on SMEs in Kaduna Metropolis. Future research is expected to cover other part of the state as well as the entire northern region. Finally, TO was used in this study to moderate INN, PRO, RST and SMEs' performance relationship. Therefore, we suggest that future researchers consider other moderators like market or learning orientations in their study.

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CORPORATE SOCIAL RESPONSIBILITY OF MAJOR PUBLIC AND PRIVATE COMPANIES IN ENERGY SECTOR OF INDIA

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ABSTRACT

This research study aims to investigate and evaluate the Corporate Social Responsibility (CSR) initiatives undertaken by major public and private companies operating in the energy sector of India. The energy sector plays a crucial role in India's economic growth and development, but it also faces several environmental and social challenges, making CSR activities essential for sustainable and inclusive growth. India is the first country to make the Corporate Social responsibility compulsory for profitable companies which satisfy the requirement of the Companies Act 2013. The findings of this study contribute to the existing literature on CSR in the energy sector by providing a comprehensive overview of the CSR practices of major public and private energy companies. The research aims to facilitate a better understanding of the role of energy companies in promoting sustainable development and to offer practical recommendations for enhancing their CSR efforts. The paper sheds light on the various CSR initiatives taken up by the energy companies in the financial year 2021-22. An attempt is made to understand the CSR policy and major CSR projects undertaken by these companies by going through their annual reports and official websites.

Keywords: Environmental sustainability, community development, corporate sustainability, social inclusion, corporate social responsibility.

INTRODUCTION

The Idea of Corporate social responsibility is based on the notion that the business houses have the responsibility to give back to society. The business Organizations operate in society and utilize the resources of the society and therefore they should contribute to the social and economic development of the Society and for the environmental sustainability. The Business organizations must satisfy the triple bottom of the economy, the people, profit, and planet. India is the first country to make the Corporate Social responsibility compulsory for profitable companies which satisfy the requirement of the Companies Act 2013. Present study is an attempt to understand the various Corporate social responsibility initiatives of major companies in energy sector to understand the contribution of these companies to the socio – economic development of the country. Our present study focuses on the CSR of major companies in energy sector in India. The study reveals that all the companies pay significant attention in making the planet a better place to live through their various CSR initiatives.

There is evidence to show that the practice of CSR has been in the culture of India much before the contemporary term CSR was evolved by the Western World. The Holly book of Hindus Bhagwat Gita has mentioned the importance of doing goof for the people and Society as 'Dharma' and 'Karma' for no reasons.

"Corporate Social Responsibility' or CSR, is the modern term for a company's responsibility to people, society, and the environment. Large conglomerates learned that in order to achieve sustainability in their businesses, they had to ensure that the welfare of all the participants in the entire business process was of utmost importance.

Mahatma Gandhi trusteeship theory- A Socio economic philosophy: -Mahatma Gandhi through his trusteeship theory recommended not only the contribution of the economic capital but he also stressed on the contribution of the human capital and said that the people hold the wealth as a trust and that it needs to go back to the welfare and prosperity of the people those who need it the most. The trusteeship theory played a significant role and influenced the industry to form trusts and society for the development of schools, colleges and support the livelihood, hunger, health, and gender equality which later became the milestone for compulsory requirement, and all these were incorporated when the companies act 2013 was passed.

“Everything belonged to God and was from God. Therefore, it was for his people as a whole, not for a particular individual. When an individual had more than his proportionate portion, he became a trustee of that portion for God’s people.”

1.1 Applicability

According to Section 135 of the companies Act 2013 below are the certain terms with which companies are to discharge their CSR obligation as provided by law-

- a) Companies with net worth of Rs 500 Crore or more; or
- b) Companies with turnover of 1000 Crore or more;
- c) Companies with net profit of 5 Crore and above.

Moreover, the CSR rules and provisions of CSR do not only apply to Indian Companies, but also applicable to branch and project offices of a foreign companies in India. Expenditure on CSR is not treated as business expenditure.

1.2 CSR Committee and Policy

Every company that qualifies the conditions as prescribed in the companies Act 2013 require to spend minimum 2% of its average net profit (profit after tax) for the immediately preceding 3 financial years on CSR activities in India. Moreover, the law mandates the qualifying companies to form a CSR Committee of the Board of Directors (Board) comprising of 3 or more directors. It is the duty of the CSR Committee to formulate and recommend to the Board, a CSR policy which shall provide the activities to be undertaken, recommend the amount to be spent on CSR activities which it has referred and monitoring the CSR Policy of the company. The Board of Directors shall consider the recommendations made by the CSR Committee and approve the CSR policy of company.

1.3 Definition of the Term CSR

CSR rule define Corporate Social Responsibility which includes but is not limited to -

- Programs or Project relating to activities specified in the schedule vii of the companies Act 2013.
- Programs or project relating to activities prescribed by the Board of Directors in pursuance of recommendations of the CSR Committee as per the specified CSR Policy subject to the condition that such policy covers subjects enumerate in the Schedule.

Companies are provided flexibility by giving them the freedom to choose their preferred CSR engagement which conforms the conditions specified in the CSR policy. The Board of member of the company may decide to carry out its CSR activities, approved by the CSR Committee, through a registered society or trust or section 8 companies with established track record.

1.4 Activities Under CSR

The activities (in areas or subject, specified in Schedule VII) that can be done by the company to achieve its CSR obligations include: Schedule VII of Companies Act 2013

- (i) Eradicating hunger, poverty, and malnutrition, promoting health care including preventive health care and sanitation including contribution to the 'Swachh Bharat Kosh' set up by the Central Government for the promotion of sanitation and making available safe drinking water;
- (ii) Promoting education, including special education and employment enhancing vocation skills specially among children, women, elderly, and the differently abled and livelihood enhancement projects.
- (iii) Promoting gender equality, empowering women, setting up homes and hostels for women and orphans; setting up old age homes, day care centres and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups;
- (iv) Ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water including contribution to the 'Clean Ganga fund' set up by the Central Government for rejuvenation of river Ganga;
- (v) Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries; promotion and development of traditional arts and handicrafts;
- (vi) Measures for the benefit of armed forces veterans, war widows and their dependents;
- (vii) Training to promote rural sports, nationally recognised sports, paralympic sports and Olympic sports;
- (viii) Contribution to the Prime Minister's National Relief Fund or any other fund set up by the Central Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled Tribes, other backward classes, minorities and women;
- (ix) Contributions or funds provided to technology incubators located within academic institutions which are approved by the Central Government;
- (x) Rural development projects;
- (xi) Slum area development.

3. Importance of the Study

The present paper is an attempt to understand the law related to the CSR in India and the commitment of major companies to discharge their social obligation considering the Companies act 2013. For the study, we have considered major companies in energy sector both public and private. Section 135 of the companies act 2013 makes it mandatory for certain type of profitable companies meeting the prescribed threshold to spend 2% of their average net profit over preceding 3 years as CSR.

Ministry of Corporate Affairs has notified the provisions of the Companies (Corporate Social Responsibility Policy) Rules, 2014 (CRS Rules) which has come into effect from 1 April 2014 and certain amendment in May 2016 as well as Section 135 and Schedule VII of the Companies Act.

Review of Literature

Bhargava et al. (2016), in this paper the efforts are made to explore the commitment of the companies to comply with the rule of spending at least 2% of their profit towards CSR activities. The companies are included from automobiles, steel and oil and Gas industry. The analysis reveals that the overall companies are far away from meeting their target of 2 % however the steel industry is outperforming with the positive variance. In addition, the paper examines the historical evolution of CSR, key dimensions of CSR and the benefits of taking up CSR activities by the companies.

Rahman et al. (2019), the paper shed light over the available CSR legislations in India regarding CSR and particularly analyse the Tata Groups commitment towards CSR. The paper includes various CSR campaigns undertaken by the company and describes the role Tata group has played in discharging their social, economic, and environmental responsibility. The finding of the study reveals that the Tata group has been performing

well in complying with the CSR legislations and has created a positive impact on society through their initiatives.

Hooda et al. (2019), The paper studies the CSR expenditures of the Maharatna companies for the period of 2014-15 to 2017-18, percentage of CSR expenditure on various activities and impact of ROA and PBDITA on CSR expenditure. The data collected is based on secondary source such as annual reports of the mahatma Companies. Finding suggests IOCL, NTPC, ONGC are spending more than prescribed percentage on an average while other Mahartna companies are not meeting the target. Companies spend a significant amount to CSR in areas of health and education as compared to other CSR areas. There is a significant positive relationship between PBDITA and CSR expenditure however ROA has negative correlation.

Parvin et al. (2018), this paper presents the drivers of CSR in India and the challenges faced by companies while undertaking and successfully implementing CSR in India. The study is based on selected software companies like Wipro, Tata, Reliance, Infosys. Data is collected through both primary and secondary sources. The findings of the paper suggest that the scale and nature of benefits from taking up CSR depend on the type and nature of business as a result it is difficult to quantify the benefits. Moreover, the motivation behind taking up the CSR initiatives besides compulsory requirement is the correlation between financial performance and social performance.

Yadav et al. (2014), attempted to study how adoption of CSR influence the image of the companies. For the purpose of the study the researcher has collected primary data from the customers as they are one of the ingredients of the stakeholders of the business. The secondary data on financial performance has been collected from secondary source. The finding suggests that there is a correlation between taking CSR initiatives and the positive corporate image of the company. CSR offers benefits to only the business but also to various other stakeholders socially and economically.

YuSheng et al. (2021) analyses the relationship between corporate social relationship and organisational performance listed in Ghana Stock Exchange. A sample of 246 respondents working at junior and senior level in the organisations were collected through survey. The analysis reveals that there is a correlation between CSR and employee satisfaction and employee satisfaction also positively impacts the Organisational performance. The impact of CSR is more if the organisation indulges in internal CSR.

Suma et al. (2022) An attempt has been made to understand the role of Corporate social responsibility in rural development in the state of Karnataka. The data is collected from the official websites of CSR. The amount spent in rural development has decreased in 2019-20 and 2020-21 in Karnataka. Moreover, the companies investing in rural development has also decreased in the state in these years.

Triple Bottom Line for Corporate Sustainability

The Triple Bottom Line (TBL) for corporate sustainability is a framework that evaluates the performance of a company or organization based on three interconnected dimensions: environmental, social, and economic. It expands the traditional focus on financial profits by considering the broader impacts of business activities on people, planet, and profit. Here's a breakdown of the three components within the context of corporate sustainability:

Environmental: This dimension assesses a company's impact on the natural environment and its efforts to minimize negative effects. It includes practices such as resource conservation, waste reduction, pollution prevention, sustainable sourcing, energy efficiency, and carbon footprint reduction. Companies committed to the TBL for corporate sustainability strive to operate in an environmentally responsible manner, mitigating their ecological impact and promoting environmental stewardship.

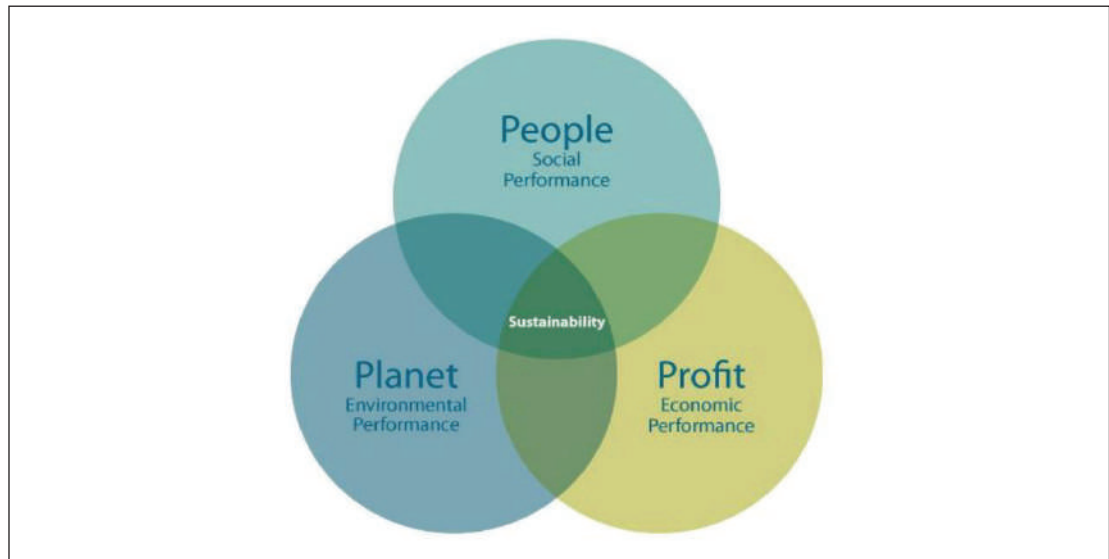
Social: The social dimension focuses on a company's impact on society and the well-being of its stakeholders. It involves considerations such as employee welfare and engagement,

labor practices, diversity and inclusion, human rights, community involvement, and product or service impacts on customers. Adopting the TBL for corporate sustainability requires businesses to prioritize social responsibility, ensuring ethical practices, fair treatment, and positive social contributions throughout their operations.

Economic: While the TBL expands the scope of corporate sustainability, it still recognizes the importance of economic viability. The economic dimension involves financial performance and profitability, as well as long-term sustainable growth. It emphasizes the need for businesses to generate profits in a responsible and ethical manner, considering both short-term financial success and long-term value creation. Economic sustainability entails maintaining profitability while also considering the social and environmental dimensions to ensure the company's long-term viability.

Figure 1

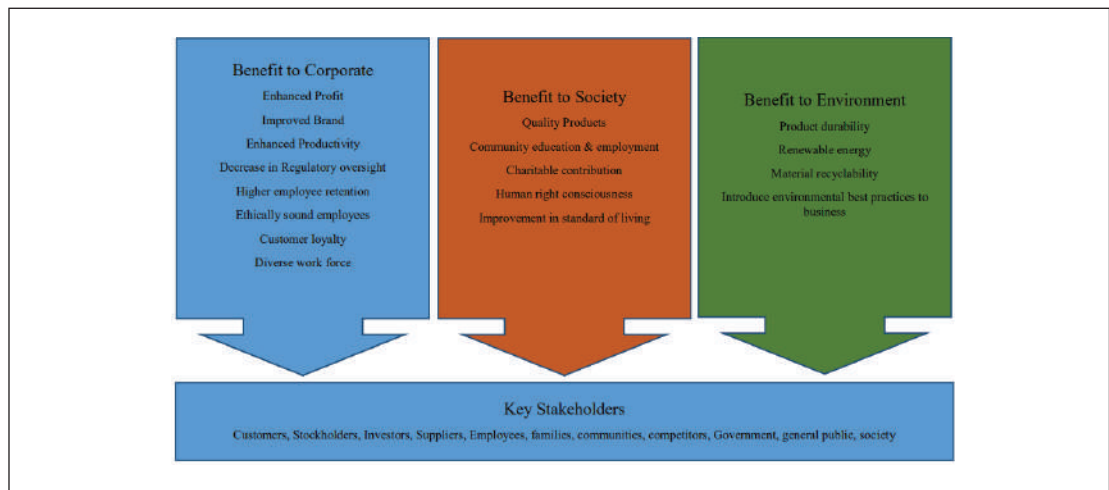
3 Pillars of Corporate Sustainability



By incorporating the Triple Bottom Line framework into their sustainability strategies, companies aim to balance economic success with social and environmental considerations. The TBL for corporate sustainability encourages businesses to take a holistic and integrated approach to decision-making, considering the broader impacts of their actions and striving for long-term sustainable practices that benefit society, the environment, and the bottom line.

Figure 2

Benefits of CSR



Objectives of the Study

- 1) To understand the CSR legislation in India.
- 2) To study the CSR initiatives and policy adopted by the energy sector companies in India.
- 3) To understand the various CSR activities undertaken by the leading companies in energy sector in India.

METHODOLOGY

Research Design: The present study is descriptive in nature and aims to provide an overview of the CSR activities undertaken by the leading companies to compensate the cost of their operating business in India.

Data collection: The paper is based on secondary data. The data for the study were collected through various sources like annual reports and official websites of Companies and government and NGS' s official websites.

Sample: The study includes 11 private and public companies from energy sector.

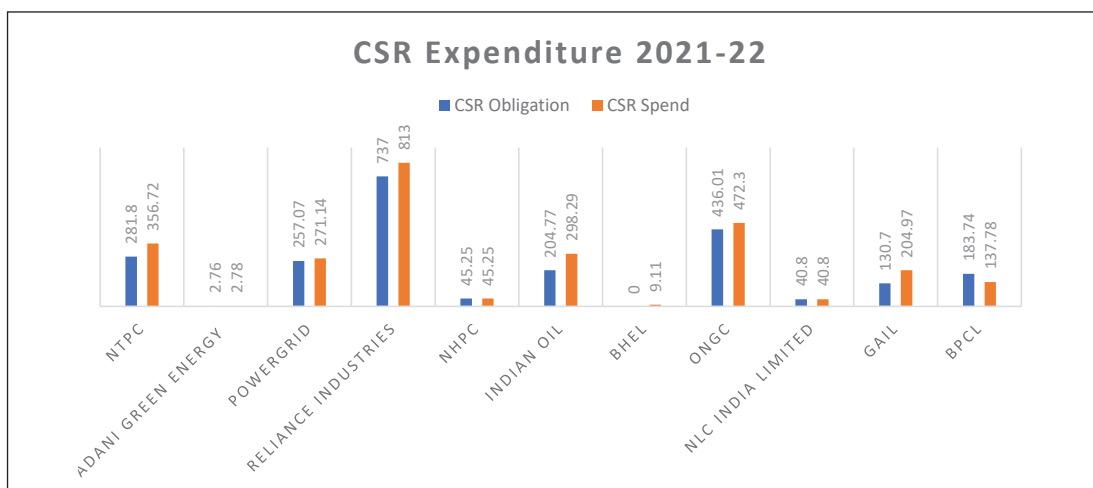
Table 1

Profit After Tax and CRS Spending in Energy Sector

S. No	Company Name	Net profit	2% of Profit	Set off Amount	CSR Obligation	CSR Spend
1	NTPC	14089.8	281.8	NA	281.8	356.72
2	Adani Green Energy	138.16	2.76	NA	2.76	2.78
3	POWERGRID	12853.5	257.07	NA	257.07	271.14
4	RELIANCE INDUSTRIES	36827	737	NA	737	813
5	NHPC	3272.3	65.45	20.2	45.25	45.25
6	Indian Oil	16157.05	323.14	118.37	204.77	298.29
7	BHEL	725.56	14.51	21.26	NA	9.11
8	ONGC	22515.8	450.32	14.3	436.01	472.3
9	NLC INDIA LIMITED	2040.23	40.8	NA	40.8	40.8
10	GAIL	6823.02	136.46	5.76	130.7	204.97
11	BPCL	8336.49	166.73	NA	183.74	137.78

Figure 3

CRS Spending in Energy Sector



National Thermal Power Corporation

NTPC total CSR spend in the year 2021-2022 was 356.72 Crore which was more than its CSR obligations as per section 135 of the companies act 2013. The company has spent an excess amount of 74.92 Crore which it can set off in succeeding financial year CSR budget. Companies CSR policy covers a wide range of activities including provision for implementation of a few key programmes taken through NTPC foundation- A charitable trust established by the company to serve mainly the physically challenged and underprivileged sections of the society and women.

The CSR activities which are undertaken by the company include activities mentioned in schedule VII of the Companies Act 2013 and rules made there under for the benefit of the community at large. Focus area of the company's CSR activities are health, sanitation, safe drinking water and education. However, company also takes up activities in the area of capacity building of the youth, women empowerment, social infrastructure development, livelihood creation through support for implementation of innovative agriculture and livestock development, support to physically challenged persons (PCPs) and for the activity contributing towards Environment sustainability.

The company majorly focuses on addressing needs of the local community but considering inclusive growth and sustainability some of the activities are also taken up in different parts of the country to supplement government efforts. During the year 2021-22 more than 450 villages and more than 400 schools have been benefitted by the companies various CSR initiatives at different locations. The CSR initiatives of the company have touched the lives of around 14 lakh people. These people generally reside in remote areas in various parts of the country in some or other way.

Adani Green Energy Limited

The company has spent a total of 2.78 Crore in CSR activity for the local community. The company had a legal obligation of only 2.76 Crore and has spent 2 lakhs in excess which it can set off in succeeding year. The Adani Group has been actively involved in CSR initiatives across various sectors, including education, healthcare, rural development, and environmental sustainability. Some of their CSR initiatives include:

Education: Adani Vidya Mandir schools have been established to provide quality education to children from underprivileged backgrounds. They also support scholarships and vocational training programs to promote skill development.

Healthcare: Adani Foundation has set up hospitals and healthcare facilities in rural and remote areas to provide medical services to communities that lack access to quality healthcare. They also organize health camps and awareness programs.

Rural Development: The Adani Group focuses on improving the lives of people in rural areas through initiatives like rural electrification, water management projects, and agricultural development programs. They work towards empowering farmers, promoting sustainable livelihoods, and enhancing rural infrastructure.

Environmental Sustainability: Adani Group has undertaken initiatives to promote renewable energy sources and reduce their carbon footprint. They have invested in solar and wind power projects, implemented energy-efficient practices, and undertaken tree plantation drives to promote environmental conservation.

Community Development: The Adani Group supports various community development programs, including women empowerment, skill development, and social welfare initiatives. They collaborate with local communities to address their specific needs and uplift their quality of life.

Power Grid Corporation of India Limited (POWERGRID)

(POWERGRID) Power Grid Corporation of India Limited, is a Schedule 'A', 'Maharatna' public sector undertaking of Govt. of India. The company was incorporated on 23rd Oct 1989 under the provisions of Company Act, 1956. POWERGRID is a listed company in which 51.34% shares are owned by the Government of India and the balance is held by the public and Institutional Investors.

POWERGRID has undertaken several initiatives to promote education and skill development. They have established schools, provided scholarships to meritorious students, and supported vocational training programs.

Health and Sanitation: POWERGRID has worked towards improving healthcare facilities in rural areas by setting up medical camps, providing medical equipment, and conducting awareness campaigns on preventive healthcare. They have also constructed toilets and facilitated access to clean drinking water.

Infrastructure Development: POWERGRID has contributed to the development of infrastructure in rural areas by constructing roads, bridges, and community centres. This has improved connectivity and provided better facilities for the local population.

Renewable Energy and Environment Conservation: POWERGRID has been actively involved in promoting renewable energy sources and reducing carbon footprint. They have implemented projects related to solar power, wind energy, and energy conservation. Additionally, they have undertaken initiatives for afforestation and biodiversity conservation.

Rural Electrification: POWERGRID has played a crucial role in electrifying rural areas of India. They have extended electricity transmission lines to remote villages, facilitating access to electricity and improving the quality of life for the residents.

Disaster Relief and Rehabilitation: In times of natural disasters, POWERGRID has provided support for relief and rehabilitation efforts. They have contributed towards rebuilding infrastructure, providing essential supplies, and offering financial aid to affected communities. The company has transferred the amount of 271.14 Crore in PM CARE fund on 29.03.2022 as their CSR obligation for the financial year 2022-23.

Reliance Industries Limited

Reliance Industries Limited is a Fortune 500 company and the largest private sector corporation in India. Over the past decade, the Company has focused on several corporate social responsibility programs. The CSR initiatives of the Company under the leadership of Smt. Nita M. Ambani, Founder and Chairperson, Reliance Foundation, have touched the lives of more than 5.75 crore people covering more than 50,600 villages and several urban locations across India. The company continues up taking of CSR activities support the lives of people and offer opportunities for their holistic development by engaging itself into various CSR activities in the areas of health, education, sports for development, disaster response, arts, culture, heritage, urban renewal and rural transformation.

For FY 2021-22 the company has spent a total amount of 813 Crore while the CSR obligation as per 2% of profit criteria was 737 Crore only. The Company has spent 76 Crore in excess which it can set off in the succeeding financial year.

National Hydroelectric Power Corporation

In terms of Section 135 of Companies Act 2013, the company shall spend, in every financial year, at least two percent of the average net profits of the company made during the three immediately preceding financial years, is kept as the annual budget for CSR&SD works. NHPC has conducted energy conservation campaigns to promote sustainable energy practices and raise awareness about the efficient use of electricity. These campaigns aim

to educate communities on energy-saving techniques and the benefits of renewable energy sources.

NHPC has actively participated in the Swachh Bharat Abhiyan, a nationwide cleanliness campaign launched by the Government of India. NHPC has organized cleanliness drives, awareness programs, and initiatives to promote sanitation and hygiene practices in surrounding communities.

The Company has undertaken extensive green initiatives to promote environmental conservation and combat climate change. They have organized tree plantation drives, afforestation programs, and campaigns to raise awareness about the importance of preserving ecosystems and biodiversity.

Indian Oil Corporation

Being a responsible corporate, Indian Oil not only ensured continuous supply of essential petroleum products and services across the nation, but also enhanced the CSR allocation beyond the prescribed CSR budget (i.e. 2% of average net profit of the immediately preceding 3 financial years) as required under the provisions of the Companies Act, 2013.

Furthermore, Indian Oil has demonstrated its CSR commitment by utilizing 100% allocated CSR budget for the fifth year in a row. The Company has sponsored/ patronized many community development projects that has changed life of people and has positively impacted numerous stakeholders involving into more than 500 projects across the length and breadth of the country.

Indian Oil spent 194.72 crore (which is 65% of total CSR expenditure) on thematic area i.e. Health and Nutrition, with special focus on Covid related measures including setting up makeshift hospitals and temporary Covid Care facilities during 2021-22, in compliance with the Department of Public Enterprises (DPE) guidelines for CSR Expenditure by Central Public Sector Enterprises (CPSE). As against the 18 Aspirational Districts allotted by DPE, the Company spent H 18.43 crore in 36 Aspirational Districts during 2021-22.

Bharat Heavy Electricals Limited

BHEL is actively engaged in various CSR programmes across the country and in their local areas of operations. The Company has created medical, educational, infrastructural facilities which has changed the lives of millions. The company has spent 21.26 Crore in excess of its CSR obligation for the financial year 2020-21 and therefore it has set off the amount for the financial year 2021-22 against its CSR obligation of 14.51 Crore for the Financial year and has still spend 9 Crore on CSR.

BHEL is taking up CSR activities/ projects which have visible social, economic, and environmental impact.

Some of BHEL is ongoing CSR programmes are given below: -

Table 2*Major Ongoing CSR Projects of BHEL*

S.No.	Project Name	BHEL's Thrust Area	State	District	Budget Allocated (In Rs. Lakh)
1	Providing Free Anti Hemophilic Factor (AHF) to Persons & Children with Hemophilia (P&Cwh) across India	Healthy India	Pan India	Pan India	78.2
2	Providing financial support for running 3 Mobile Health care Unit in Noida, Bikaner, Satpura	Healthy India	Uttar Pradesh, Rajasthan, Madhya Pradesh	Gautam Budhh Nagar, Bikaner, Satpura	85.4
3	Installation of Heritage Street Lighting system in Varanasi.	Inclusive India	Uttar Pradesh	Varanasi	100
4	Motivating Agrarian communities of Kandhamal (Odisha) for their economic transformation	Inclusive India	Odisha	Kandhamal	131.9
5	Providing medical assistance for 200 children suffering from Cancer across India	Healthy India	Pan India	Pan India	95.26
6	Setting up 36 Open Gyms in Suryapet, Telangana	Healthy India	Telangana	Suryapet	95.26
7	Construction of Tin shed & Chowki at Govt. Sr. Sec. School, Janglu	Healthy India	Rajasthan	Bikaner	18.9
8	Cleft surgery of Cleft patients in Haridwar through NGO- "MISSION SMILE"	Healthy India	Uttarakhand	Haridwar	18.9
9	Installation of Pyrolator Unit for solid waste management at Tiruvallur, Tamil Nadu	Clean & Green India	Tamil Nadu	Tiruvallur	75
10	Construction of Boys & Girls Hostel buildings at Govt. Polytechnic, Nizamad, Telangana	Responsible India	Telangana	Nizamabad	300
11	Construction of Sarai building at Dr RPGMC, Kangra at Tanda, H.P.	Healthy India	Himachal Pradesh	Tanda	200
12	Installation of 25 sets of Community Bio-digester Toilets Cluster along with drinking water facility	Clean India	Uttarakhand	Haridwar	565
13	Construction, operation and maintenance of Sulabh Toilet Complex at 12 Places in Varanasi and Chandauli	Healthy India	Uttar Pradesh	Varanasi, Chandauli	315
14	Procurement of Medical Equipment for the Health Clinic in Village Sangail, District Nuh	Healthy India	Haryana	Nuh	13.1

Source: Official website of BHEL

Oil and Natural Gas Corporation

ONGC (Oil and Natural Gas Corporation Limited) is a public sector undertaking (PSU) under the administrative control of the Ministry of Petroleum and Natural Gas, Government of India. While ONGC is not primarily a CSR company, it is involved in several corporate social responsibility (CSR) initiatives as part of its commitment to the communities and regions where it operates. The Company has recognized the importance of social responsibility and has integrated CSR activities into its overall business framework. Through these initiatives,

ONGC strives to contribute positively to the welfare and development of the society and environment in which it operates.

ONGC, being a major player in the oil and gas sector, has undertaken various CSR activities with a focus on social and environmental development. Some of the key areas where ONGC has been involved in CSR initiatives include:

1. A 300 bed multi-Speciality hospital for the underprivileged in Sivasagar, Assam: The hospital started its services for public for the first phase of the 300 bed in the first week of March 2019.
2. A Cancer Institute at Nagpur: A National Cancer Institute and a 455 bedded quaternary care oncology centre have been established by ONGC. Up to April 2019 this project has benefited more than 10,000 people.
3. An Exclusive Doorstep Medical Treatment for the Elderly: ONGC is involved in providing medical treatment to the doorstep for the elderly in the remotest villages of our country. The Company has set up 31 Mobile Medical Unit (MMUs) which are engaged in 9 states catering to the needs of 371 villages. In FY 2018-19, 592301 treatments have been extended to 17260 nos. of patients/ beneficiaries.
4. ONGC – MRPL Lady Goschen Hospital, Mangalore: Manglore District Administration approached ONGC to seek financial assistance to start a new wing in the hospital campus. ONGC provided financial assistance of Rs. 12.78 Cr to facilitate construction of new “ONGC-MRPL Wing” for Government Lady Goschen Hospital, Mangalore.
5. Ensuring Clean and Sustainable Street Lightning Solution in Remote Villages: ONGC has successfully installed 36,597 solar street lights in the rural areas where there is no access to regular electricity.

Gas Authority of India Limited

GAIL (Gas Authority of India Limited) is a responsible corporate citizen and is committed to take CSR initiatives that benefit the communities in and around its work centres. For FY 2021-2022 the company has spent 74.9 Crore more than what the company was obliged to spend on CSR activities. This reflects the company’s commitment to support the underprivileged society and to promote a more inclusive and prosperous development in the nation. Some of its various CSR programs below are few we can name:-

1. GAIL Ujjawal: It’s a CSR initiative of the Company to provide quality education to underprivileged children in rural and urban slums, providing infrastructure support in Government schools. Under the project GAIL Utkarsh, the company provided free residential coaching for Engineering / Medical entrance examinations at 4 Utkarsh Centres- Kanpur, Haldwani, Srinagar and Varanasi. The result of 2020-21 batch was announced in FY 2021-22 and out of Total 180 enrolled students under the project, 167 students qualified JEE exam.
2. GAIL Arogya: Under the Project the company has extended the medical facilities to the underprivileged section of the society through health centric initiatives such as operation of Mobile Medical Units, COVID response initiatives, STI clinics, provision of medical equipment in Government Hospitals, health camps clean drinking water and sanitation facilities` The company has been in the forefront in fight against Covid 19 pandemic.
3. GAIL Kaushal: GAIL has extended aid towards development of 6 (SDIs) Skill Development Institute as part of its collaborative efforts. The location of these Skill Development Institutes is Ahmadabad, Bhubaneswar, Vishakhapatnam, Kochi, Guwahati and Raibareili. GAIL is the nodal PSU for SDI, Raibareli. Under the support of (MoPNG) Ministry of petroleum and Natural Gas these Skill Development Institute have been set up through collective efforts of Oil PSEs and are in line with “Skill India Mission” of Government of India.
4. GAIL Unnati: Under this project GAIL has undertaken various rural development initiatives and programs. GAIL has provided street lights, Roads and other infrastructure facility, facilitating basic amenities, safe drinking water facility and providing education to the rural children among others.

5. GAIL Saksham: This projects is directed to provide people with disability (PwD) to help them live their lives with dignity and pride and reduce dependency on others so that to create sense of self sufficiency in them.
6. GAIL Sashakt: Under this project the company has undertaken various programs to empower women to learn new skills and support their family. This provides support towards weaving of blankets through women self help group and distribution of these blankets to the needy and poor in villages and old age homes of Auraiya. Support has also been provided for imparting vocational training to women with visual impairment in Delhi. Under this project the support has also been extended to the adolescent girls and women through education and employability in Pant Nagar, South Delhi.
7. GAIL Harit: Under this Project the company takes care of the environment sustainability as part of their obligation towards the ecology. The company has converted diesel boat to CNG in Varanasi which will significantly reduce the water and air pollution levels in Varanasi. Support is being provided for setting up 3 CNG crematoriums at Cuttack and Bhubaneshwar in Odisha in order to reduce usage of woods for cremation and for reducing pollution of air.

NLC India Limited

NLC India Limited as a responsible corporate citizen is carrying out a wide range of corporate social responsibility activity in areas listed in scheduled VII of the companies Act 2013. NLC India Limited has been in the forefront of tacking the adverse effects of the covid 19 pandemic since March 2020. The Company has spent Rs 40.80 Crore for the year 2021-22 towards CSR projects. The major CSR initiatives undertaken during the year 2021-22 are given below:

1. Covid 19 Pandemic.

- The Company has set up 17 Oxygen Plants of 30 Nm³/ Hr capacity in Tamil Nadu, Karnataka and Rajasthan.
- The Company has supplied 184 Oxygen Concentrators of capacity 10 lit/Min in Tamil Nadu at a cost of Rs 218.02 lakh.
- Supplied 86 Oxygen Concentrators of capacity 10 lit/Min at a cost of Rs 108.13 lakh in Rajasthan.
- Spared 10 Hired Basic Life Support Ambulances for 3 months to Cuddalore District at a cost of Rs 58.34 lakh
- Provided Financial Assistance of Rs 32.22 lakh to M/s (SERI) Socio Economic Research Institute towards distribution of PPE Garments, Hand Sanitizers, Oxygen concentrators and Probass UV-C disinfection systems for Cuddalore District, distributing Surgical Masks and Infrared forehead Thermometer in Cuddalore District.
- Distributed food packets through Sneha Opportunity Services, to the needy people in Neyveli at a cost of Rs 24.78 lakh.

2. Promoting Health Care, Nutrition & Sanitation

- Emergency / life saving treatment to common residents in Neyveli Township and patients from surrounding villages of Neyveli on OP Basis at a cost of Rs 130.94 lakh.
- Nutritional support to the students of NLCIL Schools at a cost of Rs 25.20 lakh.
- Conducting Medical camps around Neyveli at a cost of Rs 24.25 lakh.
- Construction of Trauma Care centre at Govt. General Hospital, Kurinjipadi at a cost of Rs 14.04 lakh (Under Progress).

3. Promoting Education & Employment, Enhancing Skills

- The Company has spent around Rs 1373.26 lakh during the FY 2021-22 under review, towards promoting Education & Employment Enhancing Skills. The following initiatives are undertaken.
- Financial assistance of Rs 500.00 lakh to Jawahar Education Society patronized by NLCIL towards promoting Education of the students in the operating region of NLCIL, Neyveli.

- Tuition fees of Rs 458.99 lakh towards promoting education of SC, ST & OBC Students of Jawahar Science College, Neyveli benefitting 1152 OBC students and 490 SC & ST students
- Educational Assistance of Rs 148.86 lakh towards promoting education of the students of Kendriya Vidyalaya School.
- Financial Assistance of Rs 92.50 lakh towards construction of 9 Smart Class Rooms to Sri Sarada Niketan College of Science for Women, Kodangipatti, Karur.
- Educational Assistance of Rs. 44.54 lakh to Contract Workmen Children.
- Distribution of Scholarship to girl students at a cost of Rs 7.24 lakh.

4. Promoting Rural Sports

- The Company emphasizes importance in promoting Rural Sports by conducting sports events and extending financial assistance to prominent persons in sports, who also took part in TOKYO Olympics. During FY 2021-22, Your Company has spent an amount of 30.68 lakh. ₹ The following initiatives are undertaken.
- Cash Award of Rs 5.00 lakh each to the Sports Persons Shri Sajan Prakash, Ms. Revathi Veeramani and Ms. C.A. Bhavani Devi, who had represented India in TOKYO Olympics.

Bharat Petroleum Corporation Limited

Education and Skill Development: BPCL has supported numerous educational programs and initiatives aimed at providing quality education to underprivileged children. The company has set up schools, vocational training centers, and scholarships to promote skill development among economically disadvantaged individuals.

Health and Sanitation: BPCL has undertaken several healthcare initiatives to provide access to quality healthcare in remote areas. The company has set up healthcare facilities, conducted medical camps, and supported initiatives related to sanitation and hygiene awareness.

Environmental Conservation: BPCL has been actively involved in environmental conservation efforts. The company has implemented measures to reduce its carbon footprint, promote energy efficiency, and support renewable energy projects. BPCL has also undertaken tree plantation drives and initiatives to preserve biodiversity.

Rural Development: BPCL has focused on rural development through various initiatives. The company has undertaken projects related to agriculture, rural infrastructure development, and livelihood generation. BPCL has supported farmers by providing training, agricultural inputs, and access to markets.

Disaster Relief: In times of natural disasters and emergencies, BPCL has extended support by providing relief materials, medical assistance, and financial aid to affected communities. The company has also contributed to the restoration of infrastructure and rehabilitation efforts.

Sports and Cultural Activities: BPCL has encouraged sports and cultural activities by supporting tournaments, competitions, and events at the local, regional, and national levels. The company has sponsored athletes, artists, and cultural programs to promote talent and preserve cultural heritage.

Findings

- The findings of this paper suggest that the companies have significantly contributed to address various social, economic, and environmental concerns.
- The analysis reveals that the companies are complying with the CSR rules and regulation formulated by the Indian government.
- The companies have taken up CSR initiatives in all thematic areas like well-being

of communities, supporting social causes, education, healthcare, and economic development. By actively participating in community projects, businesses can help address local needs, improve quality of life, and foster positive relationships with stakeholders.

- All the companies under study have posted CSR related information on their websites and have a CSR policy, CSR Committee and follow the rules and regulation as given in the company's act 2013.
- Companies give priority to the local area of their operation where they operate their business; however, they also take CSR initiatives in other areas as per the need and ordinance of Govt of India.

Limitations

Due to time and money constraints the below limitations of the paper could not be overcome-

The main limitation of this paper is that it only studies the CSR initiatives of the major energy sector companies' other sectors and industries are not included or considered for this study. Moreover, the data collected is limited to only the period of FY (2021-22). It is always advisable to collect or review data for last few years to better analyse the trend of the CRS spent and contribution of these companies for the overall support to the social and economic lives of the people and the environmental sustainability.

Secondly, the data collected is not firsthand rather the data is collected from the Companies websites and their annual reports. Therefore, the analysis from the beneficiary's point of view could not be possible.

CONCLUSION

Companies have created a positive overall impact on the lives of people and on the environmental and economic development through their CSR initiatives. The Companies are complying with all the provided legislations of the government of India in relation to CSR. Nevertheless, companies keep the needs of the community in the centre of their CSR planning and implementation; the companies are suggested to include the local community in their CSR planning to ensure that CSR initiatives are closely linked to the needs and priorities of the communities they aim to serve.

Companies involve stakeholders, including local communities, NGOs, employees, and government agencies, in the planning and implementation of CSR projects. Engaging with stakeholders helps understand their needs, gain support, and create sustainable solutions.

Moreover, some of the Companies have also adopted an impact assessment of their CSR initiatives so that they can get feedback and suggestion to further improve their future CSR initiatives so to have a more visible impact.

SUGGESTIONS

Companies should maintain transparency in CSR activities by regularly communicating progress, challenges, and outcomes to stakeholders. Honest reporting builds trust and credibility for the company's social efforts.

Companies should tailor CSR initiatives to meet the specific needs and preferences of the local communities where the company operates. A one-size-fits-all approach may not be as effective as addressing unique local challenges.

Companies should promote and prioritize eco-friendly initiatives, reduce carbon emissions, and promote responsible resource management and stay open to learning from successes

and failures. Use feedback and lessons learned to adapt and improve CSR strategies continually.

Companies should also promote the up taking of impact assessment of their CSR activities to further decide the areas and direction of their social efforts.

By incorporating these suggestions into their CSR framework, companies can make a more significant positive impact on society and contribute to sustainable development effectively.

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FACTORS INFLUENCING CONSUMERS' PURCHASE INTENTION TOWARDS LEGO IN PENANG

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ABSTRACT

This paper investigates the factors influencing consumers' purchase intention toward Lego in Penang. The study focuses on attitude, subjective norms, perceived behavioural control, and anticipated emotions as potential factors affecting purchase intention. The research methodology includes a survey of 200 Penang consumers aged 18 and above. The data collected uses descriptive and inferential statistical analyses, including Pearson's correlation and multiple regression analyses, to analyse the data. The findings suggest that attitude, subjective norms, and perceived behavioural control positively impact purchase intention, while anticipated emotions do not. The study contributes to understanding consumer behaviour towards interlocking plastic block toys, mainly Lego, in Malaysia. The paper concludes with recommendations for the industry and academia, limitations of the study, and future research directions. The author reflects on the research process, highlighting the challenges and learning opportunities, including time management, research skills, and statistical analysis.

The paper includes appendices with the initial research paper proposal, research questionnaire, SPSS output, project log, and Turnitin result. Overall, this paper provides insights into the factors influencing consumers' purchase intention toward Lego in Penang and contributes to the literature on consumer behaviour toward interlocking plastic block toys.

Keywords: Attitude, subjective norms, perceived behavioral control, anticipated emotions, Lego, consumer behavior, Penang.

INTRODUCTION

The present study delves into the myriad facets that shape consumers' proclivity to purchase Lego products within the vibrant market of Penang. Lego, an iconic toy brand with a longstanding legacy spanning decades, boasts a steadfast and devoted customer base. However, Lego contends with a burgeoning array of alternative recreational pursuits in light of the burgeoning digital entertainment landscape. Consequently, unravelling the intricacies of the determinants that steer consumers' inclination towards purchasing Lego products becomes imperative.

As elucidated by Kotler and Keller (2016), consumer behaviour stands as the focal point of scrutinizing how individuals, collectives, and entities navigate the processes of selection, procurement, utilization, and eventual disposal of goods, services, ideas, or experiences, all in the pursuit of fulfilling their diverse needs and desires. For marketers, an in-depth comprehension of consumer behaviour constitutes a linchpin in formulating potent marketing strategies that influence consumers' purchase decisions. Extant research endeavours have probed and substantiated various factors that sway consumers' predispositions towards purchasing a broad spectrum of products and services. Noteworthy among these studies is the work of Lee et al. (2015), which unearthed that perceived utility, user-friendliness, and gratification significantly steer consumers' intent to engage with mobile payment services. Likewise, Kim and Park's (2019) investigation yielded critical insights, positing

that perceived value, brand image, and trust influence consumers' intention to procure luxury fashion brands.

Within the Lego context, antecedent research undertakings have probed into diverse facets, including brand allegiance (Keller & Lehmann, 2006), product design paradigms (Bryson, 2013), and the strategic underpinnings of marketing initiatives (Kotler & Keller, 2016). Nevertheless, noticeable research exists in the scholarly discourse, particularly concerning the determinants that underpin consumers' intention to purchase Lego products in Penang. This research endeavour aspires to bridge this void by methodically investigating the factors that exert sway over consumers' proclivity to acquire Lego products within the distinctive context of Penang. Through a nuanced exploration of these factors, this study endeavours to enrich the academic corpus and furnish valuable insights for marketers seeking to navigate and capitalize on the dynamic consumer landscape in the Penang market.

METHODOLOGY

The methodology involves a quantitative approach to investigate the relationship between independent variables (attitude, subjective norms, perceived behavioural control, and anticipated emotions) and the dependent variable (purchase intention of Lego among consumers in Penang). The researchers develop research design and methods to identify and answer the research question and apply convenience sampling. The survey questionnaire was designed and adapted from past research studies and conducted a pilot test to ensure the questionnaire's reliability and dependability. The researchers also conducted factor analysis and reliability tests to determine the significance of variables. They also carried out Pearson's correlation and multiple regression analyses to define the relationship between the dependent and independent variables. Additionally, the data collected was analyzed using IBM SPSS.

LITERATURE REVIEW

Purchase Intention

Purchase intention can refer to the consumer's choices and preferences in purchasing a product or service. Haryo and Budhi (2015) explain that purchase intention is a consumer's intention to buy a specific product or service after some evaluation. Moreover, purchase intention refers to a consumer's reasonable effort to allow and approve an individual behaviour (Cheng & Yee, 2014). The authors declare that purchasing intention can be a factor as motivational for a consumer's purchase behaviour. In this study, purchase intention can influence a consumer's condition when purchasing a product.

Subjective Norms

According to Bianchi & Andrews (2012), attitudes are due to the three elements of emotions, behaviour, emotions, and the experience and personality of an individual to perform some action in a particular manner. In addition, an attitude refers to a specific behaviour with the psychological concept that indicates an individual intention (Ho, 2013). Moreover, another research study stated that the term attitude originates from a physical position with the explanation of perception in consumers to determine readiness to accept and purchase the product and service (Asiegbu et al., 2012).

Perceived Behavioural Control

Perceived behavioural control refers to control beliefs concerned with the existence of factors that can influence an individual's ability to carry out the behaviour (Ajzen, 2015). In other words, the variable of perceived behavioural control can influence a person's behaviour performance. The author claims that this factor in perceived power can interfere with performance; quickly, belief control will produce perceived behavioural control and self-efficacy.

Anticipated Emotions

According to Bagozzi & Dholakia (2002), anticipated emotions are the affective self-regulatory process reflected by an individual considering the end state for future success or failure. Furthermore, anticipated emotions have positive and negative emotions (Perugini & Bagozzi, 2001). For a deeper understanding, positive anticipated emotions are considered to accomplish goals, while negative emotions show vice versa (Han et al., 2015).

Theory of Planned Behaviour (TPB)

The theory of Planned Behaviour (TPB) is consistently applied and widely used for research to study and predict consumer purchase intention and behaviour in various areas. According to Ajzen (2015), in the research to study consumer behaviour, TPB has better contrast approaches in predicting and understanding human behaviour. Moreover, applying TPB allows predicting behaviour and intention concerning purchasing different products (Ajzen, 2015). The variables expected to influence the behaviour and intentions are attitude, subjective norms, and perceived behavioural control. The hypotheses for the study are developed based on the TPB and the independent variables identified in the literature review. Overall, the literature review provides a comprehensive overview of the factors influencing purchase intention and sets the foundation for the study.

RESULTS AND DISCUSSION

The study aimed to identify the factors influencing consumers' purchase intention towards LEGO in Penang. The reliability of the questionnaire was ensured through a pilot test with 30 samples, and a complete demographic profile of the respondents was analyzed. Factor analysis and reliability tests were conducted to determine the significance of variables, and Pearson's Correlation Analysis and multiple regression analysis were carried out to determine the relationship between variables.

Table 1

Result of Pearson's Correlations Analysis

	Purchase Intention	Attitude	Subjective Norms	Perceived Behavioural Control	Anticipated Emotion
Purchase Intention	1.00				
Attitude Sig. (2 tailed)	0.81 0.00	1.00			
Attitude Sig. (2 tailed)	0.67 0.00	0.70 0.00	1.00		
Perceived Behavioural Control Sig. (2 tailed)	0.75 0.00	0.76 0.00	0.63 0.00	1.00	
Anticipated Emotions Sig. (2 tailed)	0.82 0.00	0.90 0.00	0.68 0.00	0.74 0.00	1.00

Table 2

Multiple Regression Analysis R Square Value

Change Statistics							
R	R square	Adjusted R square	R square change	F change	Df1	Df2	Sig. F change
0.86	0.74	0.73	0.74	135.18	4	195	0.00

R squared value is 0.74, which indicates that attitude, subjective norms, perceived behavioural control, and anticipated emotions have a 74% impact on purchase intention. The study found that price, brand, and perceived usefulness influenced purchase intention. Additionally, the study finds that attitude, subjective norms, perceived behavioural control, and anticipated emotions have a significant positive relationship with purchase intention. The study uses statistical tools such as factor analysis, reliability analysis, and inferential statistics to analyze the data.

CONCLUSION

The study concludes that attitude, subjective norms, perceived behavioural control, and anticipated emotions have a significant positive relationship with purchase intention toward Lego in Penang. The study provides insights for Lego to improve its marketing strategies and maintain its customer base. Future research can investigate other factors influencing purchase intention toward Lego from different angles and viewpoints. The significance of this study is to provide a better understanding of the factors that will impact the consumer's purchase intention of Lego, as well as the results collected in this research study. This study can lead to more profound research as no past study on factors influencing Penang's consumers' Lego purchase intention.

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NARRATIVE REVIEW OF SUSTAINABILITY DISCLOSURES IN MALAYSIA: A COMPARATIVE ANALYSIS APPROACH

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ABSTRACT

This narrative evaluation compares the sustainability disclosure practises of four Malaysian case study organisations. This study evaluates sustainability disclosure practises in Malaysia to suggest areas for improvement as sustainability reporting becomes more important. The Global Reporting Initiative (GRI) framework, which underpins sustainability reporting in Malaysia, is reviewed to start the assessment. GRI-aligned disclosures show that organisations struggle to integrate economic, environmental, and social factors. Qualitative comparative analysis examines four case studies from different sectors and sizes. The comparative research examines sustainability disclosures' scope, significance, and alignment with stakeholders' expectations. The finding shows that all four companies have embraced the GRI framework to structure their reports, providing a consistent and standardised approach to sustainability disclosure. This demonstrates the increasing maturity of sustainability reporting practices in Malaysia. The research highlights resource constraints, reporting complexity, and inconsistent disclosure techniques. The narrative evaluation recommends stakeholder involvement, materiality analyses, and transparency to improve sustainability disclosures in Malaysia. By comparing sustainability disclosures, this study promotes Malaysia's sustainable development.

Keywords: Sustainability disclosures; sustainability reporting; narrative review; comparative analysis; Malaysia.

INTRODUCTION

The success of the Global Reporting Initiative (GRI) in Malaysia is modest but growing. While the widespread adoption of the GRI framework was not yet achieved, there were indications of progress and increasing interest in sustainability reporting practices in the country (Rezaee et al., 2023; Saxena et al., 2023; Shalhoob & Hussainey, 2023).

Some organisations in Malaysia, particularly larger companies and multinational corporations, have voluntarily adopted the GRI framework for their sustainability reporting efforts (Lee & Isa, 2023). They recognise the importance of transparency, accountability, and measuring their environmental, social, and governance (ESG) impacts. These companies often aim to enhance their reputation, attract socially responsible investors, and align with global sustainability standards (Wong et al., 2022).

Furthermore, industry associations, professional organisations, and non-profit groups in Malaysia have actively promoted sustainability reporting and guided organisations. They organise workshops, seminars, and training programs to raise awareness, build capacity, and share best practices related to GRI reporting. It is worth noting that sustainability reporting is a continuous process that requires ongoing commitment, improvement, and integration into organisational practices. The success of GRI implementation in Malaysia depends on various factors, including awareness, stakeholder engagement, regulatory support, and resource availability (Sabri et al., 2022). It would be necessary to refer to more recent data, reports, or studies to assess GRI implementation's status and level of success in Malaysia.

Sustainability reporting discloses an organisation's environmental, social, and governance (ESG) performance. This information can include metrics such as greenhouse gas emissions,

energy and water use, employee diversity, community involvement, and ethical business practices (Moalla & Dammak, 2023; Saxena et al., 2023; Shalhoob & Hussainey, 2023; Ziolo et al., 2023). Sustainability reporting aims to provide stakeholders, including investors, customers, employees, and regulators, transparent and comprehensive information about an organisation's sustainability performance. By doing so, organisations can demonstrate their commitment to sustainability, identify areas for improvement, and increase accountability and transparency.

Sustainability reporting can take various forms, including standalone reports, integrated annual reports, and disclosures in financial filings. There are also several reporting frameworks that organisations can use to guide their sustainability reporting, such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the Task Force on Climate-related Financial Disclosures (TCFD).

Differences between Sustainability Reporting

Currently, the use of sustainability reporting and ESG are being used interchangeably. However, sustainability reporting and ESG (Environmental, Social, and Governance) reporting are related concepts but differ in scope and focus.

Sustainability reporting is a broader concept encompassing an organisation's environmental, social, and governance performance. It includes reporting on sustainability issues such as environmental impacts, labour practices, human rights, product safety, and supply chain management (Imperiale et al., 2023; Jain & Tripathi, 2023). Sustainability reporting is typically used to communicate an organisation's sustainability strategy, performance, and impacts to various stakeholders, including investors, customers, and employees. On the other hand, ESG reporting focuses explicitly on the environmental, social, and governance factors that can affect an organisation's financial performance (Bhattacharya & Bhattacharya, 2023; Bissoondoyal-Bheenick, Brooks, & Do, 2023; Yilmaz, 2022; Ziolo et al., 2022). Investors and financial analysts typically use ESG reporting to evaluate a company's long-term sustainability and risk management. ESG factors include climate change, human capital management, executive compensation, and board diversity (Beretta et al., 2023; Yadav & Prashar, 2022).

In summary, sustainability reporting is a broader concept that includes ESG reporting, which focuses on the financial impacts of environmental, social, and governance factors. Both reporting forms are essential for organisations to demonstrate their commitment to sustainability and meet the expectations of their stakeholders.

The Regulations for Sustainability Reporting in Malaysia

To this extent, no specific regulations in Malaysia directly require organisations to adopt the GRI framework for sustainability reporting. However, specific regulations and initiatives in Malaysia generally encourage or support sustainability reporting (Lee & Isa, 2023; Wong et al., 2022). These include:

1. Companies Act 2016: Under Section 414 of the Companies Act 2016, companies in Malaysia are required to include a statement on their corporate responsibility in their annual report. This statement may cover environmental, social, and governance (ESG) aspects, which align with sustainability reporting principles.
2. Bursa Malaysia's Listing Requirements: Bursa Malaysia, the stock exchange of Malaysia, has introduced sustainability reporting requirements for listed companies. The Listing Requirements encourage listed companies to disclose information on their sustainability policies, practices, and performance in their annual reports.
3. Sustainability Reporting Guidelines (SRG): The Malaysian Institute of Accountants (MIA) has developed the Sustainability Reporting Guidelines (SRG), which provide a framework for sustainability reporting in Malaysia. While the SRG is not mandatory, it is a valuable reference for organisations reporting on their sustainability performance.
4. Sustainable Development Goals (SDGs): Malaysia is a signatory to the United Nations' Sustainable Development Goals (SDGs). The SDGs provide a global framework for

sustainable development, and organisations are encouraged to align their reporting and actions with the SDGs.

It is important to note that the regulatory landscape may evolve, and new regulations or guidelines related to sustainability reporting, including GRI, may be introduced by framing into TCFD in 2024 for covering environmental, Social and Governance (ESG) disclosures for publicly listed companies.

The GRI Framework for Analysing Sustainability Reporting

The GRI framework is built on reporting principles and elements that guide organisations in reporting their economic, environmental, and social impacts (Imperiale et al., 2023; Jain & Tripathi, 2023). These principles and elements ensure that sustainability reports are comprehensive, reliable, and transparent. The key cluster of the GRI framework includes reporting principles and GRI Standards. The reporting principles underpin the entire reporting process. These principles include: (1) Stakeholder Inclusiveness to ensure that the perspectives of all relevant stakeholders are considered in the reporting process. (2) Sustainability Context by placing sustainability impacts in the context of broader social, economic, and environmental trends and challenges. (3) Materiality in focusing on topics that are material, significant, and relevant to the organisation and its stakeholders. (4) Completeness by providing a comprehensive account of sustainability performance by reporting on all relevant topics. (5) Balance in presenting both positive and negative aspects of sustainability performance reasonably and rationally. (6) Comparability to ensure that sustainability reports can be compared with other reports, either within the organisation or across different entities. (7) Accuracy for ensuring that reported information is accurate, reliable, and supported by evidence. (8) Timeliness for reporting based on time to keep stakeholders informed about the organisation's sustainability performance.

In line with this, the GRI Standards are the core framework within the GRI, providing specific guidance for reporting on economic, environmental, and social topics. The Standards are organised into three categories: Economic (200 series), Environmental (300 series), and Social (400 series). The GRI framework also includes principles aligned with the reporting principles and provides additional guidance on the content of sustainability reports (Beretta et al., 2023; Yadav & Prashar, 2022). By adhering to these principles and using the GRI Standards, organisations can produce high-quality sustainability reports that effectively communicate their economic, environmental, and social impacts, fostering transparency, accountability, and stakeholder trust.

RESEARCH METHODOLOGY

This study centres around a narrative review of sustainability reporting in Malaysia. The chosen research approach intends to address the identified study objectives effectively. The purpose of this narrative review is to examine the content of sustainability reports from four companies in Malaysia. The second study objective aims to comprehensively explain the specific items of interest disclosed inside the four companies.

The selection of the four organisations is based on their exceptional reporting in the annual reports, which serves as a valuable resource for stakeholders in making consequential decisions. The annual report analysis for 2021 and 2022 is being conducted through a narrative review approach to identify and categorise themes according to the GRI Framework. It is acknowledged that with the adherence to these principles and utilisation of the GRI Standards, organisations have the potential to provide sustainability reports of superior quality that proficiently convey their economic, environmental, and social effects. This, in turn, promotes transparency, accountability, and the establishment of confidence among stakeholders.

A narrative review is a type of literature review that offers a coherent story centred around a particular topic (Jain & Tripathi, 2023; Lima et al., 2023; Velte, 2023). The present discourse examines a methodology for conducting literature reviews that places a heightened focus

on qualitative analysis in contrast to alternative approaches, such as systematic reviews (Pasko et al., 2022). Narrative reviews typically involve an exploration of the philosophical viewpoints that have influenced the existing research in the field, together with assessing the strengths and weaknesses inherent in the current body of literature (Widyawati, 2020).

The approach of documentary review is utilised to incorporate a type of narrative assessment that focuses on the critical analysis of sources given in the manner of a documentary (Aldowaisi et al., 2022; Costa et al., 2022; Jain & Tripathi, 2023). The category of documentary sources encompasses a diverse array of items, including historical records and websites associated with various companies. This study utilises documentary evaluations to analyse how corporations have portrayed their surrounding reality.

A comparative analysis is undertaken to assess many companies by locating and evaluating various sources of information to detect similarities and differences among them. Engaging in comparing and contrasting different philosophical perspectives or documentary sources is a prevalent methodology within the realm of narrative reviews. The four companies are selected based on the criteria below:

1. PETRONAS (Petroliam Nasional Berhad): Malaysia's national oil and gas company, PETRONAS, has been reporting on its sustainability efforts, including initiatives related to environmental conservation and social development.
2. CIMB Group Holdings Berhad: One of Malaysia's leading banking groups, CIMB, has been involved in sustainability reporting, focusing on responsible banking, climate change, and financial inclusion.
3. Tenaga Nasional Berhad (TNB): TNB is Malaysia's largest electricity utility company, and it has been reporting on its efforts to promote energy efficiency, renewable energy adoption, and other sustainability initiatives.
4. Digi Telecommunications: Digi is a Malaysian telecommunications company that offers a wide range of mobile, internet, and home broadband services. It is one of the leading telcos in Malaysia and has a reputation for providing good value for money.

The utilisation of a narrative review has proven to be a valuable methodology in investigating and analysing many philosophical viewpoints related to sustainable development. This technique places particular attention on the identification of commonalities and disparities among these perspectives. The review has the potential to delve into many philosophical viewpoints regarding sustainable development and evaluate the strengths and weaknesses of each method through a comparative analysis (Lima et al., 2023; Widyawati, 2020). The review may additionally explore the implications of these diverse philosophical ideas on policy and practice.

Hence, within the scope of this study, it can be concluded that narrative reviews exhibit significant effectiveness in enhancing the understanding of complex topics. Narrative reviews fulfil the objective of providing a comprehensive understanding of various perspectives related to a specific topic by employing storytelling techniques, thereby enabling a deeper appreciation of the broader context. Incorporating comparative analysis in narrative reviews enriches their comprehensiveness by enabling the examination and differentiation of various sources of information.

In order to address the research objective, the utilisation of GRI Scales has been employed to examine the sustainability information that is being provided in the annual reports for the years 2021 and 2022, as well as on the websites of the four chosen companies. The GRI model offers a complete framework for reporting sustainability, encompassing various economic, environmental, and social dimensions.

The evaluation of an organisation's specific requirements, stakeholder expectations, and the regulatory and sustainability context within Malaysia is crucial in determining the adequacy of the GRI model. Organisations can utilise the GRI framework as a fundamental basis and adapt it to suit their needs or supplement it with additional reporting frameworks or activities as deemed essential. The framework developed by the Global Reporting

Initiative (GRI) encompasses many scales and aspects that enable organisations to arrange their sustainability reporting effectively. These scales and features offer a comprehensive framework for documenting and analysing the economic, environmental, and social consequences. Here are the essential scales and elements of the GRI framework:

1. Reporting Principles: The GRI framework is based on reporting principles, including stakeholder inclusiveness, sustainability context, materiality, completeness, accuracy, balance, comparability, and reliability. These principles guide organisations in producing high-quality and meaningful sustainability reports.
2. Reporting Principles and Standard Disclosures: The GRI framework includes a set of standard disclosures organised into topic-specific sets or series. These disclosures cover various economic, environmental, and social topics, such as governance, anti-corruption, emissions, biodiversity, labour practices, human rights, product responsibility, and community engagement.
3. GRI Content Index: The GRI Content Index is a tool organisations use to map their sustainability disclosures to the relevant GRI Standards. It provides a transparent reference to locate the specific disclosures in the organisation's sustainability report.
4. Materiality: Materiality is a core concept in the GRI framework, emphasising the importance of reporting topics that have a significant economic, environmental, or social impact on the organisation or its stakeholders. Organisations are encouraged to identify and report material topics relevant to their operations and stakeholder concerns.
5. GRI Standards: The GRI Standards provide a comprehensive set of guidelines for sustainability reporting, covering various topics and indicators. The GRI Standards are organised into three categories: Economic (200 series), Environmental (300 series), and Social (400 series). Each series comprises specific standards and indicators related to the respective category.
6. Assurance: The GRI framework recognises the importance of independent assurance to enhance the credibility of sustainability reports. It guides the assurance process and encourages organisations to engage external assurance providers to assess the reliability and accuracy of their sustainability disclosures.

These GRI framework scales and elements provide a structured and standardised approach to sustainability reporting, enabling organisations to effectively measure, manage, and communicate their economic, environmental, and social impacts.

FINDINGS AND DISCUSSIONS

The study has categorised all the information gathered from the documentary review according to the guiding scales of the GRI Framework outlined in the narrative review. The prioritisation of sustainability information disclosures by the four selected organisations is based on their operational conduct and the delivery of services to the public, as shown in Table 1.

Table 1

The Scales Based on the GRI Framework Disclosed for the Four Companies

Petronas	CIMB Bank	TNB	Digi Telecommunications
Environmental Performance	Environmental Initiatives	Environmental Initiatives	Environmental Initiatives
Social Initiatives	Social and Community	Social and Community	Social and Community
Governance and Ethics	Engagement	Engagement	Engagement
Health and Safety	Responsible Financing	Responsible Energy	Responsible Business
Stakeholder Engagement	and Investment	Production and	Practices
Supply Chain and Procurement	Governance and Ethics	Consumption.	Digital Inclusion and
Innovation and Technology	Financial Inclusion	Health and Safety	Connectivity
	Employee Well-being	Governance and Ethics	Employee Well-being
	Data Security and Privacy	Supply Chain Sustainability	Governance and Ethics
	Stakeholder Engagement	Stakeholder Engagement	Stakeholder Engagement
		Innovation and Technology	

According to the data presented in Table 1, it can be observed that Petronas demonstrates a tendency to disclose sustainability information in various aspects. These include social

initiatives that highlight the company’s commitment to societal welfare. Additionally, Petronas emphasises health and safety due to the inherent risks associated with its operational activities. The disclosure of supply chain and procurement information is also notable, mainly to supply chain and procurement about the transportation of crude oil and refinery oil products and innovation and technology.

It is noteworthy that CIMB has emerged as a champion in financial inclusion, data security, and privacy, as evident from their disclosure. The close relationship between banking services and financial services in Malaysia is attributable to the inherent nature of these industries.

However, in the case of TNB, the inclusion of sustainability disclosures pertains to the responsible production and use of energy and the sustainability of the supply chain. This is because TNB collaborates with subcontractors who are involved in certain aspects of the government’s contracts. Digi Telecommunications prioritises sustainability disclosures of ethical business practises and digital inclusiveness and connectivity to underscore its position as the premier telecommunications provider in Malaysia.

Table 2 illustrates the clustering of sustainability reporting scales as stated in annual reports and websites, focusing on the five issues outlined in the GRI Framework, namely Economy, Environment, Governance, and Social. The economy cluster is distinctively characterised by its representation of Responsible Financing and Investment, Financial Inclusion, and Responsible Business practices. The Environment comprises nine scales according to the GRI Framework, while five represent the Social cluster. The specifics of the scaling list can be observed in Table 2 provided.

Table 2

The Clusters of Economy, Environment, Governance and Social

Cluster	Scales	Petronas	CIMB Bank	TNB	Digi Telecommunications
Economy	Responsible Financing and Investment		Yes		
	Financial Inclusion		Yes		
	Responsible Business Practices				Yes
Environment	Environmental Performance	Yes			
	Health And Safety	Yes			
	Innovation And Technology	Yes		Yes	
	Environmental Initiatives		Yes	Yes	Yes
	Employee Well-Being		Yes		Yes
	Data Security and Privacy		Yes		
	Responsible for Energy Production and Consumption.			Yes	
	Health And Safety			Yes	
	Digital Inclusion and Connectivity				Yes
Governance	Governance And Ethics	Yes	Yes	Yes	Yes
	Social And Community Engagement		Yes	Yes	Yes
Social	Supply Chain Sustainability			Yes	
	Stakeholder Engagement	Yes	Yes	Yes	Yes
	Supply Chain and Procurement	Yes			
	Social Initiatives	Yes			

Table 3 provides comprehensive information regarding sustainability. The narrative perspective of the sustainability reports of the four companies provides a comprehensive

context for the disclosed information, consistent with the GRI Framework's scaling criteria. As discussed in the previous section, a comprehensive presentation of information is essential for elucidating the various aspects associated with the identified clusters, namely Economy, Environment, Governance, and Social.

Table 3's data analysis reveals that social awareness and engagement reporting are predicated on capacity expansion. The information disclosed based on scales pertains to the activities carried out to create awareness campaigns, seminars, training sessions, and webinars to educate organisations on the significance and benefits of GRI reporting. Improve business, sustainability professional, and reporting practitioner comprehension of the GRI framework, reporting principles, and disclosure requirements.

The advocacy for regulatory support to promote GRI reporting for governance and ethics is notable. Collaborate with relevant government bodies and regulatory authorities to integrate sustainability reporting requirements, such as GRI, into existing regulations or to establish specific reporting guidelines following global reporting standards.

The four approved businesses presented their sustainability reports to enhance industry collaboration. Promote collaboration among industry associations, professional bodies, and business networks to share GRI-related knowledge, experiences, and challenges. Collaborative initiatives can promote learning, benchmarking, and adopting industry best practices.

According to Table 3, the four companies facilitate stakeholder engagement closely. It encourages organisations to involve stakeholders in the sustainability reporting process, including investors, customers, employees, local communities, and civil society organisations. To improve the relevance and credibility of GRI reports, seek their input, incorporate their feedback, and resolve their concerns.

According to the analysis, the four companies promote reporting for transparency and comparability. Encourage organisations to implement consistent reporting practices and to disclose pertinent information openly. Promote using the GRI Content Index to simplify navigation and comprehension of sustainability reports, assuring comparability across organisations and industries.

Table 3

The Details of the Information Being Disclosed for the Four Selected Companies

Petronas	CIMB Bank	TNB	Digi Telecommunications
Environmental Performance: This section usually covers information on the company's efforts to reduce greenhouse gas emissions, energy consumption, water usage, waste management, and conservation measures.	Environmental Initiatives: This section often covers the bank's commitment to reducing environmental impact. It may include information on carbon footprint reduction, energy efficiency measures, renewable energy usage, and waste management practices.	Environmental Initiatives: This section often covers the company's efforts to reduce its environmental impact. It may include information on energy efficiency measures, renewable energy usage, greenhouse gas emissions reduction targets, waste management practices, and water conservation efforts.	Environmental Initiatives: This section often covers the company's efforts to reduce its environmental impact. It may include information on energy consumption, greenhouse gas emissions, waste management practices, water conservation efforts, and measures to promote environmental sustainability.

Petronas	CIMB Bank	TNB	Digi Telecommunications
<p>Social Initiatives: This section focuses on the company's social impact, including community development projects, employee health and safety, diversity and inclusion efforts, and human rights practices.</p>	<p>Social and Community Engagement: Information on the bank's initiatives to support the communities in which it operates. This could include financial education programs, financial inclusion efforts, community development projects, and support for social causes.</p>	<p>Social and Community Engagement: Information on the company's initiatives to support the communities in which it operates. This could include community development projects, education and healthcare support, charitable activities, and efforts to promote social well-being.</p>	<p>Social and Community Engagement: Information on the company's initiatives to support the communities in which it operates. This could include community development projects, digital inclusion efforts, education and healthcare support, and efforts to promote social well-being.</p>
<p>Governance and Ethics: This section addresses the company's corporate governance structure, board diversity, executive compensation practices, anti-corruption policies, and ethical business conduct.</p>	<p>Responsible Financing and Investment: Disclosure of the bank's approach to responsible lending and investment practices. This may involve highlighting efforts to promote sustainable projects, support green finance, and consider ESG factors in investment decisions.</p>	<p>Responsible Energy Production and Consumption: Disclosure of the company's responsible energy production and consumption approach. This may involve highlighting efforts to promote renewable energy sources and reduce dependence on fossil fuels.</p>	<p>Responsible Business Practices: Disclosure of the company's approach to responsible business practices. This may involve highlighting efforts to promote ethical conduct, customer privacy protection, and data security.</p>
<p>Health and Safety: Specific information about the company's efforts to ensure its employees' and stakeholders' health and safety, as well as any safety programs and training provided.</p>	<p>Governance and Ethics: Information on the bank's corporate governance practices, board diversity, executive compensation policies, and measures to ensure ethical conduct and prevent corruption.</p>	<p>Health and Safety: Information about the company's efforts to ensure its employees' and stakeholders' health and safety, as well as any safety programs and training provided.</p>	<p>Digital Inclusion and Connectivity: Information about the company's efforts to provide affordable and accessible digital services to underserved and marginalised communities, promoting digital inclusion and connectivity.</p>
<p>Stakeholder Engagement: Details on how the company engages with various stakeholders, including local communities, investors, suppliers, and NGOs, to understand their concerns and integrate feedback into its operations.</p>	<p>Financial Inclusion: Details on the bank's initiatives to provide banking services to underserved and marginalised communities, promoting financial inclusion and accessibility.</p>	<p>Governance and Ethics: Details on the company's corporate governance practices, board diversity, executive compensation policies, and measures to ensure ethical conduct and prevent corruption.</p>	<p>Employee Well-being: Details on the company's initiatives to ensure the well-being of its employees, including training programs, diversity and inclusion measures, and health and safety initiatives.</p>
<p>Supply Chain and Procurement: Information on how the company manages its supply chain, ensuring responsible sourcing and compliance with environmental and social standards.</p>	<p>Employee Well-being: Information about the bank's efforts to ensure the well-being of its employees, including training programs, diversity and inclusion measures, and health and safety initiatives.</p>	<p>Supply Chain Sustainability: Information on how the company manages its supply chain, ensuring responsible sourcing and compliance with environmental and social standards among suppliers.</p>	<p>Governance and Ethics: Description of the company's corporate governance practices, board diversity, executive compensation policies, and measures taken to ensure ethical conduct and prevent corruption.</p>
<p>Innovation and Technology: This section might cover the company's efforts to invest in sustainable technologies, research, and development related to environmental and social challenges.</p>	<p>Data Security and Privacy: Disclosure of the bank's measures to protect customer data and maintain privacy in an increasingly digital and interconnected world. Stakeholder Engagement: Description of how the bank engages with its stakeholders, including customers, employees, investors, regulators, and community representatives.</p>	<p>Stakeholder Engagement: Description of how the company engages with its stakeholders, including customers, employees, investors, regulators, and community representatives. Innovation and Technology: This section might cover the company's efforts to invest in sustainable technologies, research, and development related to environmental and social challenges</p>	<p>Stakeholder Engagement: Information about how the company engages with its stakeholders, including customers, employees, investors, regulators, and community representatives.</p>

From Table 3, the four companies concentrated on improving assurance and verification. It is evident from the strategies designed to encourage organisations to seek independent assurance or verification of their sustainability reports to improve their credibility and dependability. Encourage the participation of external assurance providers in evaluating

the accuracy and completeness of GRI reporting. It is noted that the four companies are highlighting stakeholder reporting excellence in their recognition and reward programmes. This is demonstrated by establishing recognition programmes and awards for organisations whose GRI reporting practises are exemplary. Such initiatives can motivate organisations to improve their reporting standards and highlight sustainability initiatives.

By implementing these actions, the quality, consistency, and adoption of GRI reporting in Malaysia can be enhanced, resulting in more transparent and comprehensive sustainability reporting practices across all sectors and organisations.

CONCLUSION

The study focuses on the narrative review that has provided valuable insights into the sustainability reporting landscape in Malaysia, focusing on four prominent companies: Petronas, CIMB Bank, TNB (Tenaga Nasional Berhad), and Digi Telecommunications. The review employed a comparative analysis approach to assess the quality and depth of sustainability disclosures in alignment with the GRI framework. The findings reveal that the selected companies have made significant strides in sustainability reporting, reflecting a growing awareness of the importance of disclosing economic, environmental, and social impacts. All four companies have embraced the GRI framework to structure their reports, providing a consistent and standardised approach to sustainability disclosure. This demonstrates the increasing maturity of sustainability reporting practices in Malaysia.

While sustainability reporting practices have shown improvement, there are still areas for enhancement. The narrative review highlighted some common limitations across the selected companies, including limited materiality assessments that some companies may benefit from conducting more robust materiality assessments to identify and prioritise the most relevant sustainability topics. A comprehensive materiality assessment ensures that the disclosed information reflects the issues most significant to the organisation and its stakeholders. Secondly, depth of disclosure concerns with the review identified specific areas where the depth of disclosure could be further improved. Companies should strive to provide more detailed and specific information, especially concerning environmental performance, social impact, and innovation efforts. Thirdly, although stakeholder engagement was mentioned in the reports, the extent of active engagement with stakeholders varied among the companies. Enhanced stakeholder engagement can lead to more accurate reporting, better understanding of stakeholder expectations, and improved decision-making.

Future research endeavours should consider the following recommendations to advance sustainability reporting practices in Malaysia: first, conduct longitudinal studies to assess the progress and evolution of sustainability reporting practices among companies in Malaysia. This will provide valuable insights into trends and improvements over time. Second, focus on sector-specific analyses to understand the unique sustainability challenges and opportunities faced by different industries in Malaysia. This will enable targeted recommendations and better benchmarking within sectors. Third, incorporate the perspectives of various stakeholders, including investors, customers, employees, and civil society organisations, to assess their expectations and satisfaction with the disclosed sustainability information. Fourth, explore the impact of sustainability reporting on organisational decision-making, performance, and reputation. Assess how sustainability reporting influences corporate strategies and actions addressing environmental and social challenges.

In conclusion, sustainability reporting in Malaysia has witnessed significant progress, with leading companies like Petronas, CIMB Bank, TNB, and Digi Telecommunications embracing the GRI framework and disclosing essential sustainability information. While improvements have been made, there remains room for enhancing the depth and materiality of disclosures. By addressing the identified limitations and embracing future research recommendations, organisations can drive positive change and contribute to Malaysia's sustainable development journey.

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BIBLIOMETRIC AND SYSTEMATIC REVIEW: THE CASE OF AFFORDABLE HOUSING

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ABSTRACT

Globally, the housing issue has always been the centrepiece of government policies, and as such, numerous researches have been carried out to address the needs. The affordability of the citizens to have a basic shelter to live in is seldom achieved as there is always a mismatch between the supply and demand of it. On the other hand, sustainability is a global concern as it is closely related to the environment and climate change, which impacts everyone's lives. With the scarcity of natural resources, sustainable development needs to be achieved by providing affordable housing. This paper aims to explore the affordable and sustainable housing research focusing on the SCOPUS from 2013 to 2023. The two-stage analytical approach, which included bibliometric analysis and literature reviews, was adopted to establish an in-depth knowledge of the significance of affordable housing on sustainability. A total number of 448 papers published between 2013 to 2023 were analysed. The research outcome shows that the current trend has shifted from a single subject matter towards action, such as decision-making and planning. It concludes that sustainable affordable housing is not limited to real estate itself but focuses more on the interaction of humans and natural.

Keywords: Affordable housing, bibliometric, sustainability

INTRODUCTION

Shelter is one of the basic necessities for every individual (Saad, 2020). To assist low-income groups in accessing appropriate housing, affordable housing is introduced to address household needs (Osman, 2018). In general, affordable housing refers to a fair property in terms of pricing, quality and location, supporting other basic living expenses (Liu, 2021). The simplest definition of affordable housing is based on the house price to income ratio (Abelson, 2009), whereby, on the other hand, it refers to a situation where the household has sufficient income for their daily expenses after the mortgage payment (Chan, 2019).

Sustainability is a global concern (Hiep, 2021), and the importance of sustainability in our daily routines at the beginning of the third millennium cannot be underlined (Zoldy, 2022). Sustainability is the intention to satisfy current needs without compromising the capacity of future generations to satisfy their wants (Furstenau, 2020). Sustainable development has emerged as increasingly popular due to the rising concerns about the environment and climate change, as well as challenges with poverty, widening socioeconomic gaps, and tensions caused by social disparities (Giovannoni, 2013). In practical terms, the World Commission's definition of sustainability is a compromise between social justice, economics, and ecology (Ten Have, 2020).

Affordable and sustainable housing is a hot topic (Saidu, 2020), as affordable housing availability is one of the elements defining sustainable communities (Ebekoziem, 2020). "Sustainable," ideally with the meaning of "capable of being preserved or defended," needs to be thoroughly assessed in the context of housing and urban development policies (Marcuse, 1998). This paper employed bibliometrics and systematic literature review to explore the affordable and sustainable housing research focusing on the SCOPUS from 2013 to 2023 and focus on the research on affordable and sustainable housing in different countries and organisations quantify indicators by using mathematical and statistical tools to comprehend these findings better.

LITERATURE REVIEW

Sustainability is the capacity to design, implement, and maintain a desirable urban programme without compromising other equally desirable goals. Then, the concept may help illustrate the significance of long-term viability in considering such programmes (Marcuse, 1998). Institutional sustainability focuses on three main pillars, which are social, economic and environmental sustainability (Adabre, 2020). Social sustainability refers to creating an atmosphere that promotes social integration and raises the standard of living for all facets of the population. Economic sustainability refers to the purchase or rental cost, the cost of transportation, and the cost of maintaining the residence unit. Meanwhile, environmental sustainability ensures effective resource utilisation, low greenhouse gas emissions from housing facilities, efficient land use, and energy consumption.

Housing is a basic necessity for everyone to define well-being and quality of life. However, it is not easy to develop affordable housing a reality (Saad, 2020; Chan, 2019; Moghayedi, 2021). Affordable housing is introduced to assist low-income groups in accessing appropriate housing (Osman, 2020). In general, affordable housing refers to a property which is fair in terms of pricing, quality and location, supporting other basic living expenses (Liu, 2021). On the other hand, housing affordability refers to a situation where the household has sufficient income for daily expenses after the mortgage payment (Chan, 2019). However, due to fast urbanisation, property is becoming more unaffordable (Helble, 2021), and the uneven household income increase compared to the increase in house price.

METHODOLOGY

The two-stage analytical approach, which included bibliometric analysis and literature reviews, was adopted to establish an in-depth knowledge of the significance of affordable housing on sustainability. For this paper, the bibliometric analysis was applied to demonstrate the development of the field of study, and the systematic review was employed to present an overview of the current state of the pertinent literature about sustainable, affordable housing.

This paper extracted the data from SCOPUS with the search terms "affordable housing" AND "sustainability". Data from SCOPUS from the year 2013 to 2023 were extracted and analysed. The data was exported to Excel for sorting, selecting and removing the duplicate records and papers unrelated to the research topic. The total number of papers published between 2013 to 2023 is 448.

Bibliometric analysis

Bibliometric analysis is a type of research method that uses academic publications from the Scopus or WoS databases to evaluate global trends in academic research in an area of study (Alsharif, 2020). It is a valuable instrument for reviewing the scientific output, university collaboration, the result of state-owned science financing on national research and development performance, and educational effectiveness (Moral-Muñoz, 2020). The Bibliometric analysis method included science mapping and performance analysis. Science mapping concentrates on the relationship between the research constituents, while performance analysis reflects the dedication of the research constituents (Donthu, 2021).

This paper employed the VOSviewer program to analyse bibliometric factors to find citations crucial to sustainability and affordable housing. Bibliometrics can easily map large amounts of scientific literature, similar thorough literature assessments and meticulous methods that ensure the data quality used and the output produced is anticipated (Nobanee, 2021). VOSviewer is the software which analyses the co-occurrence, co-authorship, citation, co-citation, bibliographic coupling, and theme (Yu, 2020). By employing VOSviewer, it generated keyword maps based on networks or relationships between existing items and publication maps, country maps, journal maps, and maps based on a network (co-citation) (Nandiyanto, 2021).

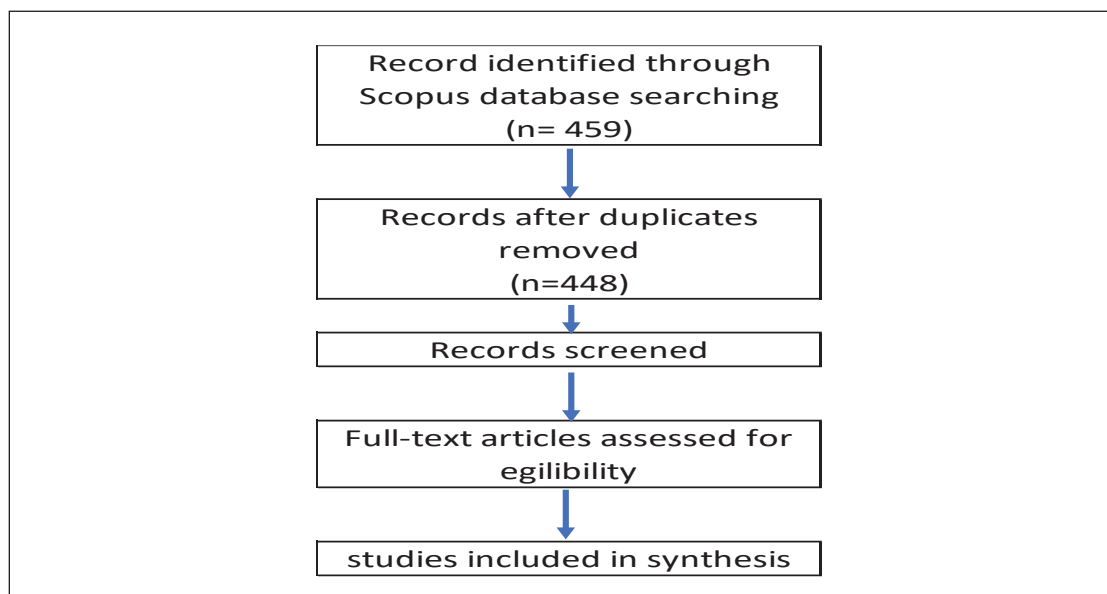
Systematic literature review

Literature review is a crucial component of academic research, where the knowledge development must be based on previous research that was completed, yet the research in social science relies on superficial and narrative evaluations without a thorough literature view (Xiao, 2019; Linnenluecke, 2020). This analysis aims to find the keywords of the data search for sustainability and affordable housing to understand the trend and the gap in this field. Therefore, this paper focuses on sustainability and affordable housing to shape the review and understand the gap.

An excellent systematic review will have a distinct focus and concentrate on published data on a subject (Linnenluecke, 2020). This paper shared the same data as bibliometric analysis and employed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology. Figure 1 shows the review's four major phases, which follow a regular pattern.

Figure 1

Flow diagram



The Scopus database was primarily used in the search to find appropriate papers based on the title, abstract, and author keywords. Additional sources were used in addition to the main database and relevant references from significant papers to the record. In order to discover relevant papers, a search string outline with keywords was employed. Sustainability and affordable housing are the excerpts of the search string.

In order to maximise the accuracy of the report, only publications from conference papers, relevant proceedings papers and international journals were considered. In contrast, publications such as master's and doctoral dissertations, books, and unpublished papers were excluded. Table 1 lists the eligibility and exclusion criteria for the record screening. Moreover, records were excluded based on the title if the paper was irrelevant to the subject area. Titles and abstracts from the records were re-examined and checked against the exclusion and eligibility criteria. All articles were reviewed, and the papers that addressed literature surveys were identified as highly relevant.

Table 1

Eligibility and exclusion criteria used in guiding systematic literature review

Criterion	Eligibility criteria	Exclusion criteria
General topic	Sustainability, affordable housing	Other
Keywords	Sustainability, affordable housing	Other
Period	2013- June 2023	Pre-2013
Literature type	International journal papers, highly relevant proceeding papers and conference papers	Others (e.g. books, editorials, letters, meeting reports, master and doctoral thesis) and duplicate reports
Publication status	Published and e-view (DOI - Digital Object Identifier) articles, articles in press, proceeding and reviews	Non-published material
Language	English	Non-English

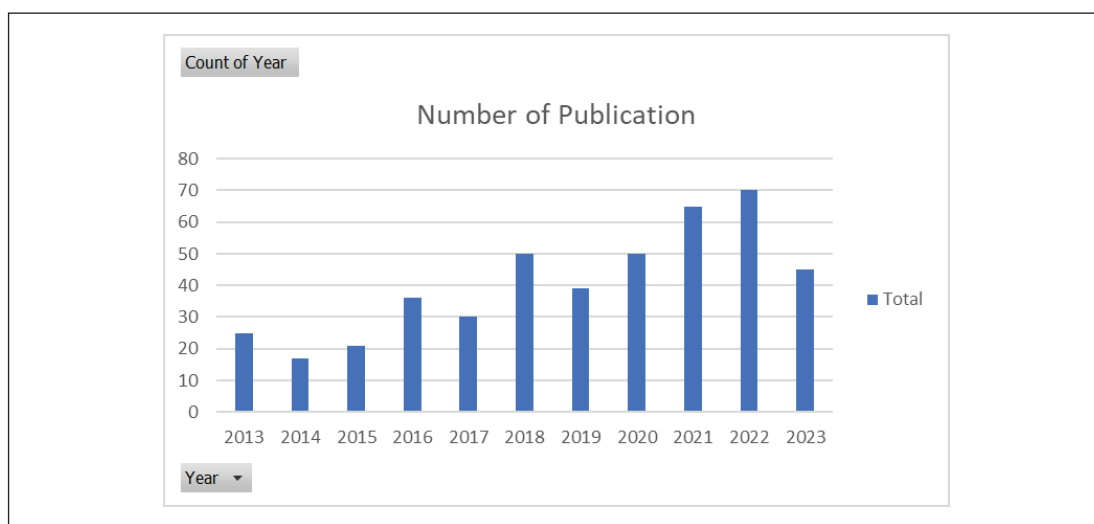
RESULTS AND DISCUSSION

Analysis by year

Sustainable Development Goals (SDGs) were introduced in 2016, providing an evidence-based sustainable development programming and planning model until 2030 (Allen, 2018). Therefore, the number of articles written about sustainability and affordable housing is increasing. Figure 2 illustrates the patterns and the number of papers by year that impact sustainability and affordable housing. The study period saw a significant increase in articles from 2013 to July 2023. The study from 2020 to 2023 is increasing rapidly, whereby most researchers focus on housing and sustainability.

Figure 2

The number of publications by years



Analysis by author

Table 2 shows the most impactful and published authors on sustainability and affordable housing. It shows the 11 most productive authors in this field. The majority of authors have two publications. Among the authors, Adabre M.A., who focuses on sustainable housing and affordable housing, used to co-author with Chan A.P.C, has the most publications, followed by Bardhan R., who focuses on sustainable building design. Besides most publications, Adabre M.A. has the highest citation among the other authors.

Among the authors, Table 3 shows the top 5 citation documents on sustainability and affordable housing, and Figure 3 shows the co-authorship and collaboration network by the author. As the authors' areas of interest vary, the authors are used to co-authorship with the same author rather than collaborating with other authors.

Table 2

The most impactful and published authors

Name of Author	h_index	Total Citation	Total Publication	Year started
Adabre M.A.	11	153	6	2019
Ahmed I.	16	0	2	2017
Bardhan R.	29	35	3	2016
Cavicchia R.	4	7	2	2021
Ezennia I.S.	7	18	2	2019
Francis A.	5	5	2	2020
Greenberg M.	156	10	2	2021
Habibi S.	8	7	2	2019
Hong T.T.	20	16	2	2013
Sharma N.	1	0	2	2017
Wilson B.B.	6	4	2	2015

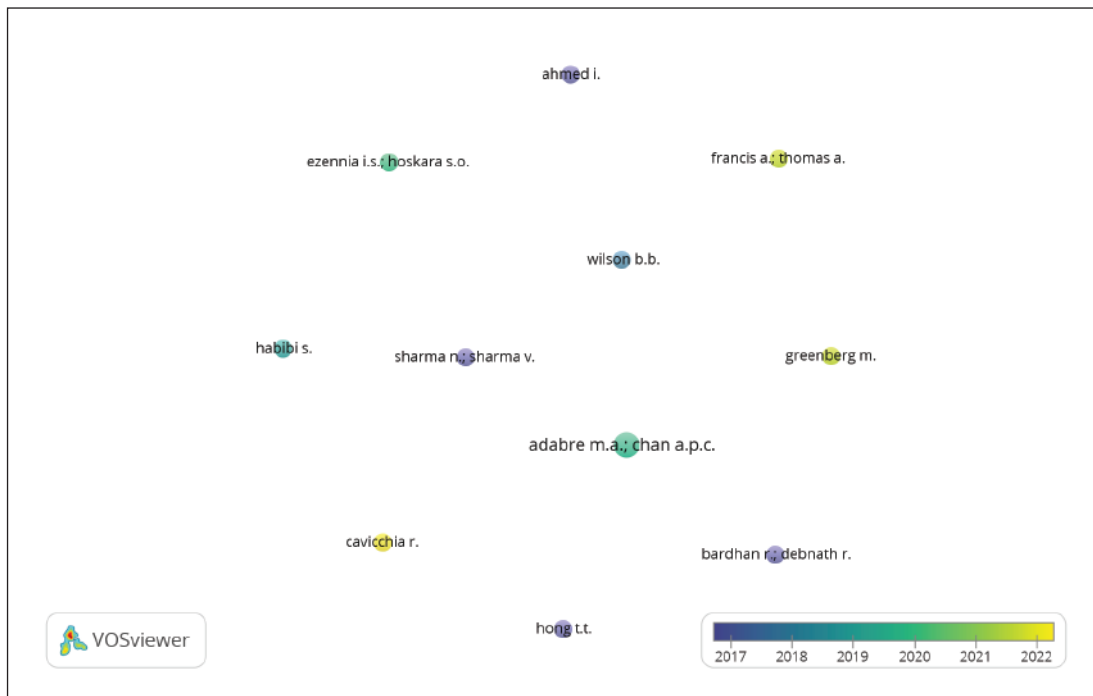
Table 3

The topics of Authors with the most citation documents

Authors	Title	Year	Source Title	Cited by
Mulliner E.; Smallbone K.; Maliene V.	An assessment of sustainable housing affordability using a multiple criteria-decision-making method	2013	Omega (United Kingdom)	189
Immergluck D.; Balan T.	Sustainable for whom? Green urban development, environmental gentrification, and the Atlanta Beltline	2018	Urban Geography	139
Wang L.; Toppinen A.; Juslin H.	Use of wood in green building: A study of expert perspectives from the UK	2014	Journal of Cleaner Production	139
Rigolon A.; Németh J.	"We're not in the business of housing:" Environmental gentrification and the non-profitisation of green infrastructure projects	2018	Cities	125
Adabre M.A.; Chan A.P.C.	Critical success factors (CSFs) for sustainable affordable housing	2019	Building and Environment	105

Figure 3

Co-authorship and collaboration network by author



Analysis by journal or source

Table 4 shows the most frequently published sustainability and affordable housing research. Based on the results, it is found that sustainability is the top journal with 40 publications, followed by the IOP Conference Series: Earth and Environmental Science with 24 publications. Most of the papers are published in the Q1 and Q2 index.

Table 4

The most frequently published sustainability and affordable housing research source

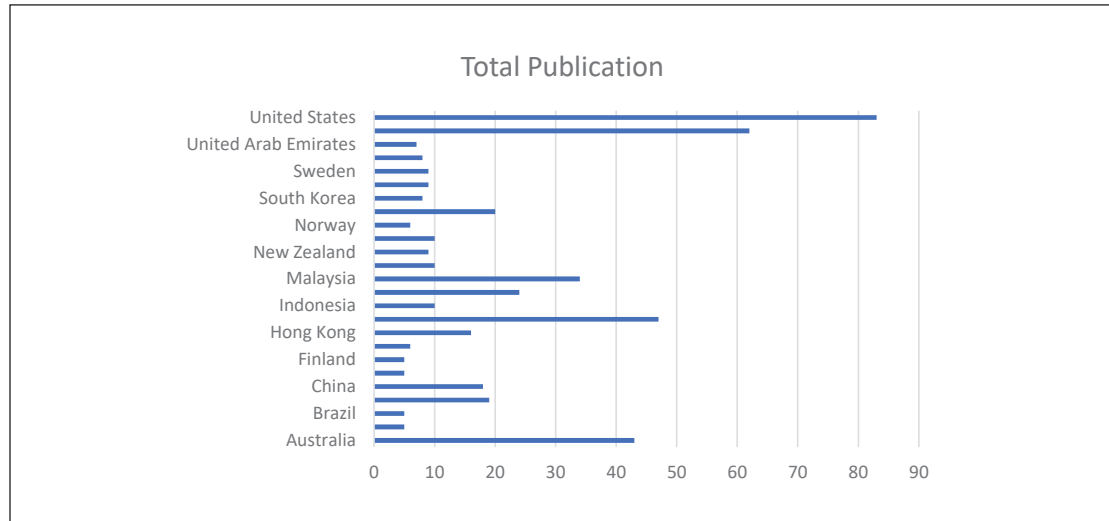
Name of Journal/Source	Country	Year Started	h_index	Q_index	Total Publication
Building and Environment	United Kingdom	2018	189	Q1	6
Buildings	Switzerland	2017	45	Q2	7
Cities	United Kingdom	2016	114	Q1	6
Habitat International	United Kingdom	2013	102	Q1	7
IOP Conference Series: Earth and Environmental Science	United Kingdom	2013	41	NA	24
Journal of Cleaner Production	United Kingdom	2014	268	Q1	6
Journal of Engineering, Design and Technology	United Kingdom	2018	29	Q2	5
Land Use Policy	United Kingdom	2016	138	Q1	5
Open House International	United Kingdom	2015	15	Q4	5
Sustainability	Switzerland	2014	136	Q2	40
The Green City and Social Injustice: 21 Tales from North America and Europe	NA	2021	NA	NA	5
WIT Transactions on Ecology and the Environment	United Kingdom	2013	27	Q4	5

Analysis by country

The United States has the highest number of publications in sustainability and affordable housing, with 83 publications with 829 citations, followed by the United Kingdom, with 62 publications with 678 citations. Working towards sustainable development goals is a global agenda for many countries. At the same time, affordable housing is part of the initiative to achieve the SDG, and researchers are working towards this direction (Hassan, 2015; King, 2017). Therefore, Figure 4 shows that 25 countries' researchers are actively publishing on this topic.

Figure 4

The total publication by country



Analysis of co-occurrence

Sustainability is a hot topic that has long been discussed. Figure 5 shows the Overlay Visualisation of co-occurrence by all keywords. Through the years, many topics related to real estate have been discussed, such as building materials, structural design, housing policy and urbanisation in different countries. With the awareness of the importance of sustainability, the publication's direction had moved to work with each other to achieve sustainability, such as social sustainability, planning and decision-making to improve the sustainability of affordable housing.

Figure 5

Overlay visualisation of co-occurrence by keywords

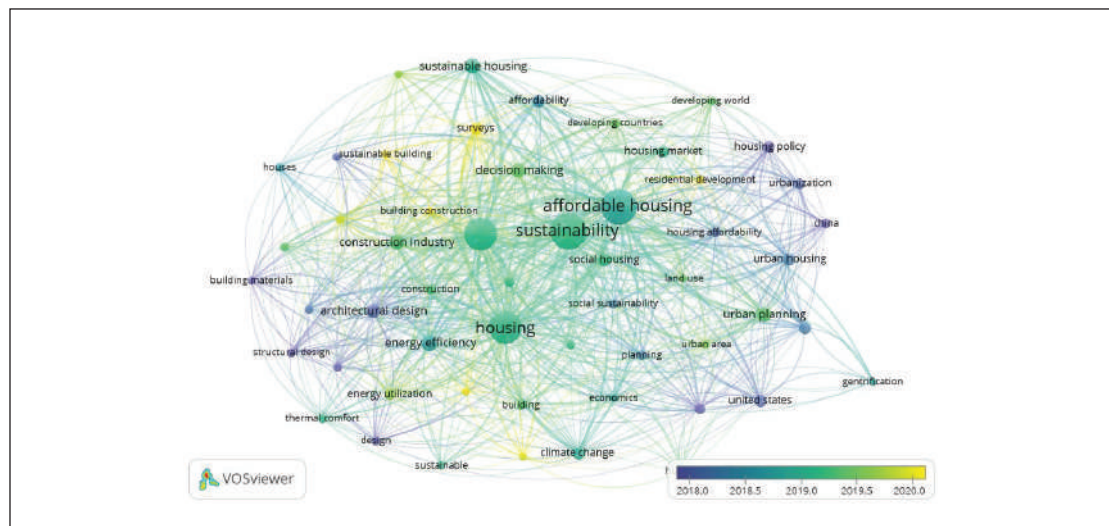


Table 5*Trend subject area from 2013 to 2023*

Subject area	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
sustainability	7	2	4	8	4	5	9	16	14	20	12	101
affordable housing	3	3	3	6	4	3	8	6	12	8	7	63
social	5	2	2	3	5	1	9	9	6	10	4	56
energy	3	3	1	4	4	2	1	6	6	11	8	49
economic	1	1	1	1	0	2	1	1	0	3	2	13
energy efficiency	1	0	0	2	0	1	1	2	1	1	0	9
urban development	0	0	0	0	1	3	0	2	1	0	0	7
climate change	1	0	0	0	0	0	0	0	0	0	0	1
construction industry	0	0	1	1	0	0	0	0	1	3	0	6
government	0	1	0	0	0	0	0	1	0	0	3	5

Table 5 shows the trend subject area from 2013 to 2023. Other than sustainability and affordable housing, it found that a few subject areas related to real estate are the topics. The need for sustainable, affordable housing is becoming crucial for many countries' social and economic progress. At the same time, the need to incorporate economic, environmental, and social factors in decision-making is one of the challenges facing globally in pursuing sustainable development goals. (Salama, 2006; Olanrewaju, 2018). For economic and social transformation to be sustainable, ecology must be maintained, and potential resources for future generations must be improved (Nair, 2005). Therefore, to study the sustainability of affordable housing, social and economic are the main subject areas.

Affordable, secure, water- and energy-efficient, connected to infrastructure and social amenities, robust to natural and man-made disasters, and finally, matching people's wants and preferences are all characteristics of sustainable and affordable housing that improve the health and safety of residents (Saidu, 2020). Meanwhile, it is crucial to create sustainable energy policies because enhancing the energy efficiency of affordable housing is vital for reducing the greenhouse effects brought on by CO₂ emissions (Lu, 2020; Chan, 2019) to achieve sustainable, affordable housing in terms of quality of life. Green building is one of the initiatives to support sustainability by reducing energy consumption, and it is the result of green affordable housing (Zulkepli, 2017; Adabre, 2019) to achieve sustainability affordable housing.

CONCLUSION

To achieve SDG is a global agenda to be achieved in 2030. Therefore, researchers are working towards understanding what improvement can be done to achieve affordable housing for the people's needs. The bibliometric and systematic review study established that sustainability and affordable housing have progressively garnered attention in recent years, starting in 2020. Even though sustainability and affordable housing co-occurrence many different keywords throughout these 10 years, the current trend on these subjects has shifted from single subject matter to action such as decision making and planning.

The systematic literature review concludes that other than real estate or affordable housing, another subject area that is relevant to real estate should be focused on improving sustainability as factors such as energy, social and economic are the factors that influence the sustainability of affordable housing. The recent climate change also raised the concern of researchers to study the feasibility of overcoming climate change to achieve sustainable, affordable housing. This outcome provides insight to other researchers that sustainable affordable housing is not limited to real estate but focuses more on human and natural interaction.

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DUTCH DISEASE AND AGRICULTURAL SECTOR OUTPUT: A NIGERIA PERSPECTIVE

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ABSTRACT

Nigeria's economy is seen as a mono-cultural economy as almost 80% of the government's revenue is coming from crude oil. This over-dependency on oil revenue hurts the economy due to the volatile nature of crude oil prices and it also causes a decline in agricultural sector output. This study, therefore examined the effect of Dutch Disease on agricultural sector output in Nigeria using annual data spanning from 1986 to 2021. The study employed Augmented Dickey-Fuller (ADF) to test for the stationarity of the time series properties of the research variables. The study also made use of the econometric tool of the Auto-Regressive Distributed Lag (ARDL) approach to estimate the short-run and long-run relationship between the agricultural output to the GDP and the determinants of the Dutch Disease in Nigeria. The overall result of the study exhibited the existence of a long-run relationship between a dependent variable and independent variables. The findings from the study revealed that there is a significant negative relationship between agricultural output and some explanatory variables such as oil revenue (OILRV), the real exchange rate (REXCH), and interest rate (INTR) with coefficients of -0.002184, -0.900190, and -0.000783 respectively. The result of the study also showed that there is a significant positive relationship between agricultural output and other regressors like government expenditure (GEXP) and trade openness (TOP) with coefficients of 0.006516 and 0.900129 respectively. Based on the findings of this study, it was recommended that the Agricultural sector should be regarded as a prerequisite and a core sector that could facilitate development as well contribute a greater percentage to the government's revenue through diversification of the economy. Also, the government should work out holistic policy measures to ensure a floating exchange rate and also make interest rates friendly for the farmers so as to boost agricultural output in Nigeria.

Keywords: Dutch Disease, Agricultural sector output, ARDL model, and the Nigerian economy

INTRODUCTION

Dutch disease is primarily associated with the discovery or exploitation of a valuable natural resource and the unexpected negative repercussions that such a discovery can have on other natural resources, sectors, and the overall economy of a nation (James Eben, 2021). Accordingly, (Bature, 2013) explained that the discovery of any tradable goods truly becomes a blessing by helping a nation to face its constitutional obligations to the people. The Dutch disease theory, therefore, refers to the situation in which a boom in an export sector leads to a shift of production factors toward the booming sector and an increase in the prices of non-tradable goods and services. Therefore, the Dutch disease is a paradoxical situation where good means for one resource or sector of the economy, such as the discovery of natural resources, resulting in a negative impact on the country's overall economy.

Agriculture is seen as the production of food and livestock and the purposeful tending of plants and animals, (Ahmed, 1993). He stated further that it is fundamental to the socio-economic development of a nation because it is a major element and factor in national development. In the same view, Okolo (2004) described the agricultural sector as the most important sector of Nigeria's economy which holds a lot of potential for the future economic development of the nation. Agriculture played a prominent role before and after the independence era in Nigeria's economy, as it was the leading sector before the oil sector was discovered. Nigeria was a net exporter of several agricultural products. Prominent among these commodities were groundnut, cocoa, cotton, palm oil, and palm kernel. Agriculture plays vital roles in the provision of employment opportunities for the teeming population, alleviates poverty and contributes to the growth of the economy. It is believed that a strong and efficient agricultural sector would enable a country to feed its fast-growing population, generate employment, earn foreign exchange, and provide raw materials for industries. On average in the Nigerian economy between 1960 and 1970, the agricultural sector output accounted for about 50 percent of the GDP and employed 72 percent of the labor force World Bank (1975) and Central Bank of Nigeria (CBN 2005) at this time.

Globally, oil is seen as one of the most essential commodities. In Africa, Nigeria is considered the largest producers of oil and the fifth largest in the Organization of Petroleum Exporting Countries (OPEC). The discovery of oil in 1956 at Oloibiri Delta State brought about a shift from the agricultural sector of the economy to the emerging oil sector which resulted in a gradual decline over time in the agricultural sector output. For instance, Manyong, Ikpi, Olayemi, Yusuf, Omonona, Okaruwa & Idachaba (2005) stated that despite Nigeria's rich agricultural resource endowments, there has been an acute decline in agriculture's contributions to the nation's wealth. Oil for the past 3 decades has provided 90 percent of the foreign exchange earnings of Nigeria and is being used for financing about 80 percent of total government expenditure. The first discovery of commercial quantities of oil in Nigeria was in 1956, with reserves estimated from sixteen to twenty-two billion barrels mostly found in various fields in the coastal regions of the Niger Delta (OPEC). The Nigerian economy is a suitable economy to test for the Dutch disease from the late 1950s, when its first oil deposit was discovered. The dependence on natural resources such as crude oil revenues makes the national economy vulnerable to market prices. The oil dependence and unpredictable oil prices in international markets can lead to problems in fiscal planning, reduce the quality of public spending, and lead to financial disaster when oil prices drop unexpectedly.

Substantial economic growth is a result of the expiration of oil, and the boom of world oil prices during the past several years. Drilling, extraction, and exportation of crude oil have been increasing substantially and it has become the leading sector in the Nigerian economy while agricultural sector output has partially been neglected. Also, the evidence of what is called "Dutch disease" in Nigeria is due to the augments of crude oil exploration and exploitation as well as the geometric dwindles of the agricultural sector of the economy (Duruji and Dibia, 2017). Moreover, at the peak of the oil boom, NRG1, (2015) observed that the agricultural sectors of the economy were hurt as a result of the large increase in natural resource revenue. This harm was done by causing inflation or exchange rate appreciation and shifting labor and capital from the non-resource sector to the resource sector of the economy (Ross, 1999). Nigeria can no longer cultivate food for its fast-growing population nor could the agro-based industries operate at full capacity to serve the nation domestically as well as exporting to the international market (Aliyu, 2011). In addition to this, it is very perplexing that despite Nigeria's huge agricultural potential, the importation of many quantities and varieties of foods to feed its geometric population is on high increase (Onuka, 2017).

Furthermore, the enormous influx of cash from oil tends to foster wasteful, overzealous, extravagant spending and in fact, the high oil revenue raises the exchange rate and promotes an adverse balance of payment as the cost of imports rises (Otaha, 2012). According to Lewis (1984), the increase in natural gas prices associated with the balance

of payment surpluses resulted in an increasing guilder during the 1970s. The appreciation in turn works against the Agricultural and manufacturing sector.

Over the years, several empirical studies emphasized the effect, evidence, and extent of Dutch disease on the agricultural sector output of an economy. Researchers like Aliyu (2011) Ammani (2011) and Omgba (2011) discovered that Dutch disease was positively related to the agricultural sector. On the contrary view by other researchers like Chukwuka et al. (2013), Adebisi (2012), Abdulaziz et al (2018), Pergis et al (2014) discovered that Dutch disease was negatively related with agricultural sector output. It is on this note that this study is set to fill the gap, by examining the effect of Dutch disease on agricultural sector output in Nigeria.

EMPIRICAL LITERATURE

Olusi and Olagunju (2005) examined the presence of Dutch Disease using Nigeria as a case study; in their study, quarterly data from 1980 to 2003 was used. A vector autoregressive (VAR) modeling was used as their method of estimation and the result reveals that the economy suffers from the Dutch disease. Aliyu (2011) had an empirical work where the graphical descriptive statistics and the one-way analysis of variance technique were used, the investigation sought to know whether the neglect of the agricultural sector was due to a result of the discovery and exploitation of oil in Nigeria during the period of oil boom (1973-1983). The research found a significant increase in the quantity of capital expenditure allocated to the agricultural sector during the period of the oil boom and thus, more capital expenditure was allocated to the agricultural sector than was allocated to the health, education and defense sector in Nigeria during that period. After the findings of the study, he concludes by rejecting the hypothesis that the neglect of the agricultural sector was due to an oil boom.

Adebisi, (2012) examined the analysis of oil and exchange rate in Nigeria; a case of Dutch disease. He used annual time series data from 1960 to 2010. His study covers both fixed and post-fixed exchange rate systems in Nigeria. A Vector autoregressive (VAR) modeling, Impulse response functions (IRF), and Variance decomposition analyses were used. In his study, Dutch disease was diagnosed and the conclusion was made that the contraction of the agricultural sector in Nigeria was as a result of the sudden windfall from oil.

Paulo, Jhean, and Guilherme (2017) carried out a study on the resource curse using a Dutch disease and economic complexity analysis for 122 countries from 1963 to 2013. From the study, it was established that oil shares were in excess of 50% of exports in oil-exporting countries. It was concluded that big data may offer significant contributions to the still-current debate surrounding the Dutch disease.

Onakoya and Adabanija (2013) examined the effect of oil discovery on sectoral performance in Nigeria, from the time period of 1975 - 2010. The study employed Vector Error Correction Mechanism (VECM). The VECM confirmed that oil discovery in Nigeria affects both the agricultural and industrial sectors. Is"haq and Mansur (2016) Used the Autoregressive Distributed Lag (ARDL) approach, and time frame of 1981–2014. Is Nigeria affected by the Dutch disease? The findings revealed that Nigeria is more affected by corruption disease than Dutch Disease.

Chukwuka et al, (2013), examined the oil exploitation and agricultural commodity export in Nigeria, taking an empirical evaluation of the extent and impact of Dutch disease from 1970 to 2011 that is, annual time series data was used. Their study evaluates how the discovery and exportation of crude oil have impacted the production and exportation of agricultural output. The study was analyzed using co-integration and vector error correction models in other to explore the long-run relationship between agricultural commodity export and oil export. The results of this study show that in the long run, Dutch disease is present in Nigeria that is the more Nigeria produces and export oil, the lower the output and less competitive the traditional tradable sector becomes Stijns (2003) employed a gravity

trade model to empirically test the Dutch Disease syndrome in a number of countries. The study found strong evidence of the Dutch disease, with energy price-led booms systematically tending to hurt manufacturing exports of the energy exporters. Ogbonna, Innocent Chukwuka¹, Uwajumogu et al (2013) examined the impact of crude oil discovery, exploitation, and exportation on the agricultural commodity export (AGO) in Nigeria in the period 1970-2011. Specifically, the study sought to evaluate how the discovery and exportation of crude oil have impacted the production and export of agricultural output. Annual time series data were used. co-integration and vector error correction models were employed. The results show that in the long run, Dutch disease (DD) is present in Nigeria.

Ibe, R. C and Ihejirika, U. (2017) empirically investigated the presence of Dutch disease (DD) in Nigeria covering the period from 1981-2015 by using the unit root test, Johansen cointegration technique, and Granger Causality test. The findings indicate the presence of Dutch Disease (DD) in Nigeria.

Ammani (2011) used a graphic descriptive statistic and one-way analysis of variance technique to answer the following question: "Was agriculture neglected as a result of the oil boom?" Secondary data on capital expenditure for the agriculture and health sectors, education, water resource, and defense sector were collected before and during the oil boom. The outcome showed that the capital expenditure and budgets allocated for the agricultural sector exceeded those of other sectors during the oil boom. However, the author confirmed that agricultural production in Nigeria cannot be attributed to the neglect of the agricultural sector that resulted from the oil boom.

Ongba (2011) and Ammani (2011) claimed that the windfall of oil cannot be held responsible for the fall in the agricultural sector. The study utilized time series data for 1978–2009 and also applied VAR model and Granger causality test to explore the study. The results of the study did not reveal co-integration between the growth of the oil sector and non-oil sectors. However, Granger positively causes non-oil GDP growth in the short-run oil GDP growth.

Ijirshar (2015) looked into the empirical analysis of agricultural exports and economic growth in Nigeria. An annual time series data from 1970 to 2012 was employed in the analysis. The econometrics techniques used were: Augmented Dickey-fuller (ADF) unit root test, Johansen Co-integration test, and Error Correction Model (ECM). The results of the analysis showed that; the results of the co-integration test exhibited that a long-run equilibrium relationship exists among the variables. Also, the result of the Error Correction Model showed that agricultural export has contributed positively to the Nigerian economy.

Fasanya, Onakoya, and Adabanija (2013) examined the effect of oil discovery on sectoral performance in Nigeria, from the time period of 1975 - 2010. The study employed Vector Error Correction Mechanism (VECM). The VECM results confirmed that oil discovery in Nigeria affects both the agricultural and industrial sectors.

Moradi et al. (2010) applied the error correction model (ECM) to investigate the effect of price fluctuation on the amounts of industrial and agricultural value added to GDP and non-oil GDP for the Iranian economy. A symptom of Dutch disease was found. Sekumade (2009) also analyzed the effect of oil export and production on five agricultural export commodities. The result of ECM showed that the production of oil palm and groundnut is negatively affected by the amount of crude oil production. This finding means that increased production of crude oil in Nigeria causes less production of cocoa, cotton, and palm oil.

Laguda (2019) analysed the impact of Dutch disease on Nigerian economy using Ordinary Least square method, Two-Stage Least Square and Autoregressive Distributed Lag with a system of equation from 1981 to 2017. The study found a decline in the manufacturing sector over the years.

Obie (2022) assessed the prospects for reverse Dutch disease in the oil-rich economies of sub Saharan Africa. The study made use of household survey data to explore the study

and it was revealed that there is a significant relationship between agricultural supply and international market. The study also showed that lowering the trade cost and boosting agricultural productivity can assist offset the lost income from oil.

METHODOLOGY

Theoretical Framework

This study adopted Dutch-Disease as the theoretical framework. The Dutch disease is associated with the adverse effect of the natural resource boom on the manufacturing sector/agricultural sector of a natural resource-rich country. The pioneering work on the Dutch disease was carried out by Corden and Neary (1982). Corden and Neary's (1982) theoretical analysis is based on the assumption that the naturally endowed country has three sectors known as the non-tradable sectors (NTS), manufacturing sector (MANP)/ agricultural sector, and resource sector (RSEC). The boom of Natural resources will affect the naturally endowed country through the spending effect and the resource movement effect. The spending effect occurs when the government's expenditure increase occasion by a boom, which leads to an increase in domestic absorption and exchange rate appreciation. The resource movement effect also involves the movement of labor away from the non-tradable sector to the oil and gas sector thereby reducing output in that sector (Neary & Van1986). For the purpose of this study, the agricultural sector (AGRIC) is modeled and expressed mathematically below

$$AGRIC = f(NRS, EXCH, TEXT, LAB) \dots \dots \dots (i)$$

Where; *AGRIC* = agricultural sector, *NRS* = natural resource, *EXCH* = Exchange rate, *TEXT* = Government expenditure and *LAB* = *LABOUR*

The schema for the equation *i* hold as follow

$$AGRIC \downarrow \rightarrow NRS \uparrow \rightarrow EXCH \uparrow \rightarrow TEXT \uparrow, LAB \downarrow \dots \dots \dots (ii)$$

Where the arrow indicates direction of each of the identified variables in the model.

The above equation is based on the certain assumption that holds that; labor is perfectly mobile among all three sectors and make sure that wage equalizes across them, all goods are for final consumption, trade is always balanced as national output always equals expenditure, and commodity and factor price are not distorted. In the above equation (ii), there is a decline in agricultural sector output caused by the negligence of the sector by the government due to an increase in natural resources. According to Michael (2003) increase in oil sector output in Nigeria caused impediments to growth in other sectors as a result of easy money, lack of good policies from the government could have removed these obstacles and produced a more balanced pattern of growth. The continuous increase in this phenomenon leads to exchange rate appreciation and total expenditure of government (spending effect); therefore, leads to the movement of labor from the agricultural sector to the booming sector (natural resource). A situation is known as the resource movement effect.

Model Specification

The model for this study is underpinning on the theoretical framework of manufacturing sector of Dutch-Disease as propounded by Corden and Neary (1982). The basic model of Corden and Neary (1982) is given below in a linear model.

$$AGRIC = f(NRS, EXCH, TEXT, LAB) \dots \dots \dots (iii)$$

The modified model for this study is given below as follow;

$$AGRIC = f(OILRV, EXCH, INTR, TEXT, TOP) \dots \dots \dots (iv)$$

Where;

AGRIC = Agricultural sector output,

OILRV= Oil Revenue used to proxy dutch disease

EXCH = Exchange rate,

INTR = interest rate

TEXP = Total government expenditure and TOP= Trade openness

The autoregressive distributed lagged specification of equation (iv) above is presented in equation (v) as:

$$\begin{aligned} \Delta \text{AGRIC} = & \beta_0 + \sum_{i=1} \beta_1 \Delta \text{AGRIC}_{t-i} + \sum_{i=0} \beta_2 \Delta \text{OILRV}_{t-i} + \sum_{i=0} \beta_3 \Delta \text{EXCH}_{t-i} \\ & + \sum_{i=0} \beta_4 \Delta \text{INTR}_{t-i} + \sum_{i=0} \beta_5 \Delta \text{TEXP}_{t-i} + \sum_{i=0} \beta_6 \Delta \text{TOP}_{t-i} + \omega_1 \text{AGRIC}_{t-1} \\ & + \omega_2 \text{OILRV}_{t-1} + \omega_3 \text{EXCH}_{t-1} + \omega_4 \text{INTR}_{t-1} + \omega_5 \text{TEXP}_{t-1} + \omega_6 \text{TOP}_{t-1} + v_t \text{ -----(v)} \end{aligned}$$

Where: $\omega_1 - \omega_6$ are the long run multipliers and v_t is the white noise error.

DATA ANALYSIS AND INTERPRETATION OF RESULT

Covariance Analysis

Table 1

Correlation Matrix

Variable	AGRIC	OILRV	EXCH	INTR	TEXP	TOP
AGRIC	1.000000					
OILRV	-0.275916	1.000000				
EXCH	0.047101	-45.05772	1.000000			
INTR	0.342507	14.51562	56.88648	1.000000		
TEXP	-0.081869	-5.334155	24.34722	-2.453527	1.000000	
TOP	12.37547	655.3543	-431.8772	693.7457	-227.7015	1.000000
	0.0000	0.0000	0.7887	0.0156	0.0000	

Source: Researcher's Compilation from E-view-9 (2023)

In Table 1 above, it was revealed that the agricultural sector output (AGRIC) coefficient was in line with Pearson's correlation assumption that states that there must be a perfect and strong relationship between a variable and against itself (i.e. X1 against X1). The economic implication of this is that continuous increase in agricultural output in the agricultural sector within the years reviewed is perfectly proportional to the factors inputs employed in the sector.

For oil revenue (OILRV), it had a negative and strong relationship with agricultural sector output (AGRIC), with a coefficient value of approximately 27.6% and p-value of 0.000. Statistically, this implies that an increase in oil revenue brought about a decrease in agricultural products with a moderate degree of impact. This finding implies that declining

in output in the agricultural sector is due to an increase in revenue generated from oil and gas industries which resulted in the government not providing enable infrastructural development for the sector.

In terms of the degree of association between exchange rate and agricultural sector output (AGRIC), the finding confirmed a moderate relationship between them with a coefficient value of 4.7% and a p-value less than 5%. This, therefore, confirmed a direct relationship between the duo with the exchange rate having a greater effect on it. In economic terms, the finding implies that exchange rate appreciation in terms of naira relative to the US dollar (N/\$) encourages output in the agricultural sector in Nigeria.

The coefficient of interest rate proved to be positive and significant with a value of 34.3%. This shows that access to lower lending rate by farmers promote productivity in the agricultural sector by 34.3%. Also, the government expenditure (TEXP) p-value was less than 0.05 with a coefficient value of approximately 8.1%, implying a moderate degree of association. In economic terms, this shows that the contribution from the agricultural sector to the country's GDP is infinitesimal compared to other sources of revenue; hence, lower government expenditure.

Furthermore, a direct relationship was confirmed between trade openness and agricultural sector output (AGRIC) with a strong degree of association with a p-value of less than 5%. This established a positive relationship between them. From the correlation matrix above it was confirmed that the relationship between the variables identified was strong.

Pre-test Result

Augmented Dickey Fuller (ADF) Unit Root Test

Table 2

Results of Unit Root Test

Variable	Test at Level			Test at first level difference			Level of Integration
	ADF	1% C.V	5% CV	Test Statistic	1% C.V	5% CV	
AGRIC	-0.395731	-3.646342	-2.954021	-3.901995	-	-	I(1)
					3.646342	2.954021	
OILRV	-1.698157	-3.632900	-2.948404	-6.425103	-	-	I(1)
					3.639407	2.951125	
EXCH	-4.172070	-3.632900	-2.948404	-7.089318	-	-	I(0)
					3.639407	2.951125	
TEXP	-1.175122	-3.639407	-2.951125	-9.108602	-	-	I(1)
					3.639407	2.951125	
INTR	-2.151251	-3.653730	-2.957110	-4.955468	-	-	I(1)
					3.653730	2.957110	
TOP	-0.043661	-3.632900	-2.948404	-5.780109	-	-	I(1)
					3.639407	2.951125	

Source: Researcher's Compilation from E-view-9 (2023)

Table 2 shows the Augmented Dickey-Fuller (ADF) result of the test at level and test at first differences. The findings inferred that the exchange rate (EXCH) was the only variable that was stationary at level, i.e., I (0). Also, it was confirmed that all the variables include, agricultural sector output (AGRIC), oil revenue (OILRV), government expenditure (TEXP), and trade openness (TOP) stationary at the first level difference, i.e. I(1). The economic implication of this finding is that at the integration of order I(1), other economic variables do not cause change among the variables identified in the model; therefore, become independent of themselves.

Lag Order Selection

Since unit root tests have been applied, the next step is selection of the lag order to be used for the ARDL approach as developed by Pesaran et al. (2001).

Table 3

Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-595.2133	NA	92094894	35.36549	35.63485	35.45735
1	-441.5872	243.9945	94359.26	28.44630	30.33181*	29.08932
2	-394.6974	57.92270*	61327.32*	27.80573*	31.30738	28.99989*

* indicates lag order selected by the criterion

Table 3 shows the optimal lag length of the selected variables in the model; since the calculation of ARDL bounds is sensitive in the selection of the lag length. The finding revealed that many of the criterion indicators selected an optimal lag length of two. Therefore, this study selected an optimal lag length of two because the majority of the criterion indicators selected it.

ARDL Result

Table 4

Short-run Result

$R^2=0.989432$; Adjusted $R^2=0.984838$; Prob.(F-statistic) = 0.000012; Durbin-Watson stat=1.998901				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
AGRIC(-1)	1.163196	0.066514	17.48808	0.0000**
OILRV	-0.002184	0.000652	-3.347436	0.0028**
EXCH	7.500005	4.780005	-2.195560	0.1305
EXCH(-1)	-0.900190	0.410005	-2.561208	0.0175**
TEXP	0.006516	0.002324	2.804245	0.0101**
TEXP(-1)	-0.002037	0.001503	-1.355061	0.1886
INTR	-0.000783	0.000212	-3.699408	0.0012**
TOP	-1.930005	4.000005	-0.482500	0.6362
TOP(-1)	0.900129	0.390005	2.307993	0.0112**
TOP(-2)	-0.230005	0.990005	-0.232330	0.1324
Constant	-0.009223	0.008168	-1.129147	0.2705

** indicate statistically significant at the 0.05

Source: Researcher's Compilation from E-view-9 (2023)

Table 4 shows the short-run ARDL result. The results for agricultural sector output (AGRIC) for the immediate past year were significant with a direct effect. In economic terms, this implies that an increase in yearly output in the agricultural sector within an economy in the previous year, to a large extent influenced its increase in the current year. The direct and significant nature of agricultural sector output (AGRIC) could be attributed to the fact that agricultural sector output (AGRIC) is the highest employer of labor in Nigeria; hence, its production in terms of subsistence or large-scale contributes hugely to the economy.

For the oil revenue (OILRV), the finding confirmed an indirect and statistically significant effect on agricultural sector output (AGRIC). The indirect and significant nature of the finding

was not surprising when looking at the fact that there was a drastic decline in agricultural sector output (AGRIC) from years 1986-1995 when compared with the geometric increase in oil revenue during the same years.

The exchange rate (EXCH) had an inversely co-efficient (90.0%) and was statistically significant at the 5% level. In the immediate past year, the negative sign of the exchange rate was contrary to the a priori expectation formulated for this study. This finding implies that exchange rate appreciation reduces productivity in the agricultural sector and; therefore, reduces its share of yearly GDP. The contrary nature of the real exchange rate to manufacturing sector output could be attributed to the fact that Nigeria’s government adopts a floating exchange rate system in which the determination of the exchange rate is allowed by market forces.

Government expenditure (TEXP) was positive and significant at a 5% significance level. The economic implication of this finding is that a steady increase in agricultural productivity coupled with the high increase in oil revenue increases government spending on health, welfare, defense, education, and pension. The positive and significant nature of government expenditure is attributed to two reasons. First, revenue from crude oil over the past years has been the major source of revenue for the Nigerian government which increases government expenditure on both the recurrent and capital expenditure.

Secondly, agricultural sector output also contributes to the government’s coffer through its sectoral contribution to real gross domestic product.

The coefficient of interest rate (INTR) was significant and negative. The negative sign of the interest rate was in consonance with a priori expectation. In the case of interest rates, its economic implication is that reduction in lending rates would increase the demand for funds by farmers and investors in the agricultural sector; therefore, increasing productivity in the sector.

Furthermore, trade openness (TOP) was directly related to the agricultural sector and had significance at 0.05. Thus, implying that the aggregate value of both the import and export coupled with gross domestic product influences agricultural sector output. However, the establishment of the positive influence of trade openness on agricultural sector output conformed to economic theory.

Bound Test Result

Table 5

ARDL Bounds Test

Test statistics	Value	K	
F-statistic	4.961379	5	
Significance		10 Bound	11 Bound
		2.26	3.35
		2.62	3.79
		2.96	4.18
		3.41	4.68

Source: Researcher’s Compilation (2023) from E-view-9

The table above shows that the F-statistic value was greater than the critical upper bound value at 1%, 2.5%, 5%, and 10% significance levels; therefore, indicates a long-run relationship between agricultural sector output (AGRIC), oil revenue (OILRV), exchange rate (EXCH) government expenditure (TEXP) interest rate (INTR) and trade openness (TOP).

Long-run Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OILRV	-0.013382	0.005611	-2.385130	0.0257**
EXCH	0.000703	0.000359	1.958372	0.0624*
TEXP	-0.027444	0.016045	-1.710467	0.1006
INTR	0.004796	0.001971	2.432890	0.0232**
TOP	-0.000293	0.000275	-1.064573	0.2981
Constant	0.056512	0.050735	1.113853	0.2768

** indicates statistically significant at the 0.05 and 0.1 level

Source: Researcher's Compilation from E-view-9

The long-run result showed that oil revenue (OILRV) was significant at 5% with a direct effect on agricultural sector output (AGRIC), judging from the p-value (0.0257) which was less than 0.05. Statistically, this implies that a 1% increase in oil revenue brought about a 1.3% increase in agricultural sector output (AGRIC). Oil revenue had a strong effect on agricultural sector output judging from the obtained estimated coefficient. This implies that there is a high tendency in the future for the agricultural sector to be ignored at the expense of oil exploration.

Furthermore, it was confirmed that the exchange rate (EXCH) was significant and directly related to agricultural sector output (AGRIC), judging from the p-value (0.0624) that was greater than 0.1.

Statistically, this implies that the exchange rate had a positive effect on AGRIC. This implies that exchange rate appreciation was responsible for the increase in agricultural exported goods.

The long-run result for government expenditure (TEXP) was not statistically significant at a 5% conventional level judging from the p-value of the estimated result that was greater than 0.05.

The long-run coefficient of interest rate (INTR) had a positive sign and was significant at a 5% significance level. Statistically, this implies that a 1% increase in interest rate (INTR) brought about a 0.4% increase in agricultural sector output. The implication of this is that increase in the lending rate to the agricultural sector would increase in the long run. Hence, worsens productivity in the sector.

The coefficient of trade openness (TOP) was negative and not significant. This implies that trade openness had zero effect on agricultural sector output (AGRIC).

The negative sign of trade openness was in consistency with a priori expectations. In the case of trade openness, its economic implication is that there is an increase in farm imported goods which results in a decline in the rate of agricultural out in the country.

Diagnostics Test for ARDL

Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.359136	Prob. F(10,23)	0.1430
Obs*R-squared	17.21577	Prob. Chi-Square(10)	0.1697
Scaled explained SS	10.70857	Prob. Chi-Square(10)	0.3807

From the result, the F-statistic is greater than 0.05. Hence, indicate that the ARCH test is free of Heteroskedasticity

4.4.2 Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.069357	Prob. F(2,21)	0.1513
Obs*R-squared	5.597594	Prob. Chi-Square(2)	0.1609

The serial correlation LM test suggests that the residual of the ARDL model did not suffer from autocorrelation. Therefore, The LM test indicates no serial correlation problem since the p-value is greater than 0.05.

CONCLUSION AND POLICY RECOMMENDATIONS

This study examined the effect of Dutch Disease on agricultural sector output in Nigeria using annual data spanning from 1986 to 2021. The overall result of the study showed there is co-movement of a long-run relationship between a dependent variable and independent variables. The findings also revealed that there is a significant negative relationship between agricultural output and some explanatory variables such as oil revenue (OILRV), the real exchange rate (REXCH), and interest rate (INTR) with coefficients of -0.002184, -0.900190, and -0.000783 respectively. The result of the study also exhibited that there is a significant positive relationship between agricultural output and other regressors like government expenditure (GEXP) and trade openness (TOP) with coefficients of 0.006516 and 0.900129 respectively. In line with the findings of this study, it was recommended that the Agricultural sector should be regarded as a prerequisite and a core sector that could boost development as well contribute a greater percentage to the government's revenue through diversification of the economy. Moreover, government should fashion out holistic policy measures to ensure a floating exchange rate and also make interest rates friendly for the farmers so as to boost agricultural output in Nigeria.

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APPENDIX

Covariance Analysis: Ordinary
Date: 01/23/23 Time: 19:21
Sample: 1986 2021
Included observations: 36

Covariance Probability	AGRIC	OILRV	EXCH	INTR	TEXP	TOP
AGRIC	1.000000 -----					
OILRV	-0.275916 0.0000	1.000000 -----				
EXCH	0.047101 0.0486	-45.05772 0.2911	1.000000 -----			
INTR	0.342507 0.0078	14.51562 0.0625	56.88648 0.5359	1.000000 -----		
TEXP	-0.081869 0.0005	-5.334155 0.0001	24.34722 0.1586	-2.453527 0.4492	1.000000 -----	
TOP	12.37547 0.0000	655.3543 0.0000	-431.8772 0.7887	693.7457 0.0156	-227.7015 0.0000	1.000000 -----

Null Hypothesis: OILRV has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.698157	0.4234
Test critical values:		
1% level	-3.632900	
5% level	-2.948404	
10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(OILRV)
 Method: Least Squares
 Date: 01/23/23 Time: 19:46
 Sample (adjusted): 1987 2021
 Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OILRV(-1)	-0.148001	0.087154	-1.698157	0.0989
C	1.121091	0.641618	1.747287	0.0899
R-squared	0.080363	Mean dependent var		0.278282
Adjusted R-squared	0.052496	S.D. dependent var		2.471428
S.E. of regression	2.405684	Akaike info criterion		4.648990
Sum squared resid	190.9813	Schwarz criterion		4.737868
Log likelihood	-79.35733	Hannan-Quinn criter.		4.679671
F-statistic	2.883737	Durbin-Watson stat		2.111427
Prob(F-statistic)	0.098890			

Null Hypothesis: EXCH has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.172070	0.0025
Test critical values:		
1% level	-3.632900	
5% level	-2.948404	
10% level	-2.612874	

*Mw6) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EXCH)
 Method: Least Squares
 Date: 01/23/23 Time: 19:50
 Sample (adjusted): 1987 2021
 Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCH(-1)	-0.536678	0.128636	-4.172070	0.0002
C	55.04942	15.88638	3.465196	0.0015
R-squared	0.345318	Mean dependent var		-4.468286
Adjusted R-squared	0.325479	S.D. dependent var		50.35439
S.E. of regression	41.35566	Akaike info criterion		10.33774
Sum squared resid	56439.58	Schwarz criterion		10.42662
Log likelihood	-178.9105	Hannan-Quinn criter.		10.36842
F-statistic	17.40617	Durbin-Watson stat		1.279213
Prob(F-statistic)	0.000206			

Null Hypothesis: D(EXCH) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.089318	0.0000
Test critical values: 1% level	-3.639407	
5% level	-2.951125	
10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EXCH,2)
 Method: Least Squares
 Date: 01/23/23 Time: 19:51
 Sample (adjusted): 1988 2021
 Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCH(-1))	-0.992335	0.139976	-7.089318	0.0000
C	0.763755	7.074340	0.107961	0.9147
R-squared	0.610982	Mean dependent var		5.095882
Adjusted R-squared	0.598825	S.D. dependent var		64.88321
S.E. of regression	41.09596	Akaike info criterion		10.32672
Sum squared resid	54044.09	Schwarz criterion		10.41650
Log likelihood	-173.5542	Hannan-Quinn criter.		10.35734
F-statistic	50.25843	Durbin-Watson stat		1.985254
Prob(F-statistic)	0.000000			

Null Hypothesis: AGRIC has a unit root
 Exogenous: Constant
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.395731	0.8986
Test critical values:		
1% level	-3.646342	
5% level	-2.954021	
10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(AGRIC)
 Method: Least Squares
 Date: 01/23/23 Time: 19:54
 Sample (adjusted): 1989 2021
 Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGRIC(-1)	-0.011196	0.028292	-0.395731	0.6952
D(AGRIC(-1))	0.664241	0.180558	3.678819	0.0009
D(AGRIC(-2))	-0.365314	0.199160	-1.834274	0.0769
C	0.007335	0.004366	1.679823	0.1037
R-squared	0.318540	Mean dependent var		0.008693
Adjusted R-squared	0.248044	S.D. dependent var		0.012906
S.E. of regression	0.011191	Akaike info criterion		-6.034186
Sum squared resid	0.003632	Schwarz criterion		-5.852791
Log likelihood	103.5641	Hannan-Quinn criter.		-5.973152
F-statistic	4.518563	Durbin-Watson stat		1.807614
Prob(F-statistic)	0.010186			

Null Hypothesis: D(AGRIC) has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.901995	0.0053
Test critical values:		
1% level	-3.646342	
5% level	-2.954021	
10% level	-2.615817	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(AGRIC,2)
 Method: Least Squares
 Date: 01/23/23 Time: 19:56
 Sample (adjusted): 1989 2021
 Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AGRIC(-1))	-0.716970	0.183744	-3.901995	0.0005
D(AGRIC(-1),2)	0.370726	0.195877	1.892649	0.0681
C	0.005898	0.002392	2.465453	0.0196
R-squared	0.339119	Mean dependent var		0.000303
Adjusted R-squared	0.295060	S.D. dependent var		0.013140
S.E. of regression	0.011033	Akaike info criterion		-6.089406
Sum squared resid	0.003652	Schwarz criterion		-5.953360
Log likelihood	103.4752	Hannan-Quinn criter.		-6.043631
F-statistic	7.696965	Durbin-Watson stat		1.798518
Prob(F-statistic)	0.002004			

Null Hypothesis: TEXP has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.175122	0.6737
Test critical values:		
1% level	-3.639407	
5% level	-2.951125	
10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(TEXP)
 Method: Least Squares
 Date: 01/23/23 Time: 19:57
 Sample (adjusted): 1988 2021
 Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TEXP(-1)	-0.137200	0.116754	-1.175122	0.2489
D(TEXP(-1))	-0.351836	0.166715	-2.110408	0.0430
C	0.342145	0.411504	0.831452	0.4121
R-squared	0.221118	Mean dependent var		-0.033846
Adjusted R-squared	0.170867	S.D. dependent var		1.335323
S.E. of regression	1.215901	Akaike info criterion		3.312945
Sum squared resid	45.83088	Schwarz criterion		3.447624
Log likelihood	-53.32007	Hannan-Quinn criter.		3.358875
F-statistic	4.400307	Durbin-Watson stat		1.919416
Prob(F-statistic)	0.020788			

Null Hypothesis: D(TEXP) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.108602	0.0000
Test critical values:		
1% level	-3.639407	
5% level	-2.951125	
10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(TEXP,2)
 Method: Least Squares
 Date: 01/23/23 Time: 19:58
 Sample (adjusted): 1988 2021
 Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TEXP(-1))	-1.423051	0.156231	-9.108602	0.0000
C	-0.074371	0.210296	-0.353648	0.7259
R-squared	0.721658	Mean dependent var		0.061944
Adjusted R-squared	0.712960	S.D. dependent var		2.282952
S.E. of regression	1.223116	Akaike info criterion		3.297704
Sum squared resid	47.87244	Schwarz criterion		3.387490
Log likelihood	-54.06096	Hannan-Quinn criter.		3.328323
F-statistic	82.96663	Durbin-Watson stat		1.952234
Prob(F-statistic)	0.000000			

Null Hypothesis: INTR has a unit root
 Exogenous: Constant
 Lag Length: 3 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.151251	0.2271
Test critical values: 1% level	-3.653730	
5% level	-2.957110	
10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INTR)
 Method: Least Squares
 Date: 01/23/23 Time: 20:00
 Sample (adjusted): 1990 2021
 Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR(-1)	-0.552148	0.256664	-2.151251	0.0406
D(INTR(-1))	0.004656	0.240633	0.019350	0.9847
D(INTR(-2))	-0.024567	0.215790	-0.113847	0.9102
D(INTR(-3))	-0.092961	0.189532	-0.490478	0.6278
C	2.173630	1.882876	1.154420	0.2584
R-squared	0.295284	Mean dependent var		0.565312
Adjusted R-squared	0.190882	S.D. dependent var		11.10484
S.E. of regression	9.988911	Akaike info criterion		7.583429
Sum squared resid	2694.015	Schwarz criterion		7.812450
Log likelihood	-116.3349	Hannan-Quinn criter.		7.659343
F-statistic	2.828333	Durbin-Watson stat		1.760050
Prob(F-statistic)	0.044256			

Null Hypothesis: D(INTR) has a unit root
 Exogenous: Constant
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INTR,2)
 Method: Least Squares
 Date: 01/23/23 Time: 20:03
 Sample (adjusted): 1990 2021
 Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTR(-1))	-1.933418	0.390159	-4.955468	0.0000
D(INTR(-1),2)	0.573805	0.293643	1.954091	0.0607
D(INTR(-2),2)	0.277610	0.179596	1.545744	0.1334
C	0.780349	1.879030	0.415294	0.6811
R-squared	0.668317	Mean dependent var		0.248437
Adjusted R-squared	0.632779	S.D. dependent var		17.51905
S.E. of regression	10.61632	Akaike info criterion		7.679131
Sum squared resid	3155.778	Schwarz criterion		7.862348
Log likelihood	-118.8661	Hannan-Quinn criter.		7.739863
F-statistic	18.80594	Durbin-Watson stat		1.825123
Prob(F-statistic)	0.000001			

Null Hypothesis: TOP has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
	Augmented Dickey-Fuller test statistic	-0.043661	0.9564
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(TOP)
 Method: Least Squares
 Date: 01/23/23 Time: 20:04
 Sample (adjusted): 1987 2021
 Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOP(-1)	0.002251	0.051561	0.043661	0.9654
C	15.72676	13.29229	1.183149	0.2452
R-squared	0.000058	Mean dependent var		16.17157
Adjusted R-squared	-0.030244	S.D. dependent var		49.76327
S.E. of regression	50.51018	Akaike info criterion		10.73767
Sum squared resid	84192.17	Schwarz criterion		10.82655
Log likelihood	-185.9093	Hannan-Quinn criter.		10.76835
F-statistic	0.001906	Durbin-Watson stat		2.038970
Prob(F-statistic)	0.965438			

Null Hypothesis: D(TOP) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.780109	0.0000
Test critical values: 1% level	-3.639407	
5% level	-2.951125	
10% level	-2.614300	

*MacKinnon (1996) one-sided p-values.
 Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(TOP,2)
 Method: Least Squares
 Date: 01/23/23 Time: 20:06
 Sample (adjusted): 1988 2021
 Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TOP(-1))	-1.064071	0.184092	-5.780109	0.0000
C	17.47295	9.126794	1.914468	0.0645
R-squared	0.510776	Mean dependent var		2.854310
Adjusted R-squared	0.495487	S.D. dependent var		71.98995
S.E. of regression	51.13378	Akaike info criterion		10.76379
Sum squared resid	83669.25	Schwarz criterion		10.85358
Log likelihood	-180.9844	Hannan-Quinn criter.		10.79441
F-statistic	33.40965	Durbin-Watson stat		1.941039
Prob(F-statistic)	0.000002			

VAR Lag Order Selection Criteria
 Endogenous variables: AGRIC OILRV EXCH TEXP INTR TOP
 Exogenous variables: C
 Date: 01/23/23 Time: 20:09
 Sample: 1986 2021
 Included observations: 34

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-595.2133	NA	92094894	35.36549	35.63485	35.45735
1	-441.5872	243.9945	94359.26	28.44630	30.33181*	29.08932
2	-394.6974	57.92270*	61327.32*	27.80573*	31.30738	28.99989*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Dependent Variable: AGRIC

Method: ARDL

Date: 01/23/23 Time: 20:13

Sample (adjusted): 1988 2021

Included observations: 34 after adjustments

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (2 lags, automatic): OILRV EXCH TEXP INTR TOP

Fixed regressors: C

Number of models evaluated: 486

Selected Model: ARDL(1, 0, 1, 1, 0, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
AGRIC(-1)	1.163196	0.066514	17.48808	0.0000
OILRV	-0.002184	0.000652	-3.347436	0.0028
EXCH	7.500005	4.780005	-2.195560	0.1305
EXCH(-1)	-0.900190	0.410005	-2.561208	0.0175
TEXP	0.006516	0.002324	2.804245	0.0101
TEXP(-1)	-0.002037	0.001503	-1.355061	0.1886
INTR	-0.000783	0.000212	-3.699408	0.0012
TOP	-1.930005	4.000005	-0.482500	0.6362
TOP(-1)	0.900129	0.390005	2.307993	0.0112
TOP(-2)	-0.230005	0.990005	-0.232330	0.1324
C	-0.009223	0.008168	-1.129147	0.2705
R-squared	0.989432	Mean dependent var		0.144354
Adjusted R-squared	0.984838	S.D. dependent var		0.075696
S.E. of regression	0.009321	Akaike info criterion		-6.256932
Sum squared resid	0.001998	Schwarz criterion		-5.763109
Log likelihood	117.3678	Hannan-Quinn criter.		-6.088524
F-statistic	215.3456	Durbin-Watson stat		1.998901
Prob(F-statistic)	0.000012			

*Note: p-values and any subsequent tests do not account for model selection.

ARDL Bounds Test

Date: 01/23/23 Time: 20:16

Sample: 1988 2021

Included observations: 34

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.961379	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Test Equation:
 Dependent Variable: D(AGRIC)
 Method: Least Squares
 Date: 01/23/23 Time: 20:16
 Sample: 1988 2021
 Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCH)	6.83E-05	6.33E-05	1.079666	0.2915
D(TEXP)	0.004442	0.002852	1.557514	0.1330
D(TOP)	-4.99E-05	4.89E-05	-1.019449	0.3186
D(TOP(-1))	4.14E-05	4.74E-05	0.873434	0.3915
C	-0.001548	0.009438	-0.163964	0.8712
OILRV(-1)	-0.002193	0.000818	-2.679576	0.0134
EXCH(-1)	-0.000112	7.35E-05	-1.518065	0.1426
TEXP(-1)	0.003616	0.002456	1.472319	0.1545
INTR(-1)	-0.000404	0.000260	-1.556832	0.1332
TOP(-1)	5.71E-05	3.79E-05	1.507034	0.1454
AGRIC(-1)	0.100951	0.077726	1.298795	0.2069
R-squared	0.454896	Mean dependent var		0.008508
Adjusted R-squared	0.217895	S.D. dependent var		0.012754
S.E. of regression	0.011279	Akaike info criterion		-5.875484
Sum squared resid	0.002926	Schwarz criterion		-5.381662
Log likelihood	110.8832	Hannan-Quinn criter.		-5.707077
F-statistic	1.919382	Durbin-Watson stat		1.902329
Prob(F-statistic)	0.094856			

ARDL Cointegrating And Long Run Form
 Dependent Variable: AGRIC
 Selected Model: ARDL(1, 0, 1, 1, 0, 2)
 Date: 01/23/23 Time: 20:21
 Sample: 1986 2021
 Included observations: 34

Breusch-Godfrey Serial Correlation LM Test:

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OILRV)	-0.002184	0.000652	-3.347436	0.0028
D(EXCH)	0.000075	0.000048	1.568042	0.1305
D(TEXP)	0.006516	0.002324	2.804245	0.0101
D(INTR)	-0.000783	0.000212	-3.699408	0.0012
D(TOP)	-0.000019	0.000040	-0.479443	0.6362
D(TOP(-1))	0.000062	0.000040	1.560144	0.1324
CointEq(-1)	0.163196	0.066514	2.453577	0.0221

Cointeq = AGRIC - (0.0134*OILRV + 0.0007*EXCH -0.0274*TEXP + 0.0048

*INTR -0.0003*TOP + 0.0565)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
OILRV	-0.013382	0.005611	-2.385130	0.0257
EXCH	0.000703	0.000359	1.958372	0.0624
TEXP	-0.027444	0.016045	-1.710467	0.1006
INTR	0.004796	0.001971	2.432890	0.0232
TOP	-0.000293	0.000275	-1.064573	0.2981
C	0.056512	0.050735	1.113853	0.2768

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.069357	Prob. F(2,21)	0.1513
Obs*R-squared	5.597594	Prob. Chi-Square(2)	0.1609

Test Equation:

Dependent Variable: RESID

Method: ARDL

Date: 01/25/23 Time: 07:48

Sample: 1988 2021

Included observations: 34

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGRIC(-1)	0.060056	0.075084	0.799854	0.4328
OILRV	-0.000708	0.000786	-0.900295	0.3782
EXCH	-5.81E-06	4.60E-05	-0.126300	0.9007
EXCH(-1)	-1.51E-05	7.13E-05	-0.211278	0.8347
TEXP	-7.51E-05	0.002247	-0.033425	0.9737
TEXP(-1)	-0.000542	0.001463	-0.370750	0.7145
INTR	0.000104	0.000211	0.493167	0.6270
TOP	1.52E-05	3.93E-05	0.388447	0.7016
TOP(-1)	-2.09E-05	4.64E-05	-0.450087	0.6573
TOP(-2)	-1.31E-05	4.02E-05	-0.324943	0.7484
C	0.003237	0.008094	0.399907	0.6933
RESID(-1)	-0.158293	0.254927	-0.620935	0.5413
RESID(-2)	-0.511075	0.251252	-2.034112	0.0548

R-squared	0.164635	Mean dependent var	2.14E-17
Adjusted R-squared	-0.312716	S.D. dependent var	0.007781
S.E. of regression	0.008916	Akaike info criterion	-6.319171
Sum squared resid	0.001669	Schwarz criterion	-5.735563
Log likelihood	120.4259	Hannan-Quinn criter.	-6.120144
F-statistic	0.344893	Durbin-Watson stat	2.148710
Prob(F-statistic)	0.969408		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.359136	Prob. F(10,23)	0.1430
Obs*R-squared	17.21577	Prob. Chi-Square(10)	0.1697
Scaled explained SS	10.70857	Prob. Chi-Square(10)	0.3807

Test Equation:
 Dependent Variable: RESID^2
 Method: Least Squares
 Date: 01/25/23 Time: 07:52
 Sample: 1988 2021
 Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000106	7.25E-05	1.454807	0.1592
AGRIC(-1)	0.002361	0.000591	3.997093	0.0006
OILRV	-1.54E-06	5.79E-06	-0.265137	0.7933
EXCH	-2.75E-07	4.25E-07	-0.648054	0.5234
EXCH(-1)	-7.75E-07	6.58E-07	-1.177834	0.2509
TEXP	1.00E-05	2.06E-05	0.484496	0.6326
TEXP(-1)	-2.16E-05	1.34E-05	-1.614275	0.1201
INTR	-1.73E-06	1.88E-06	-0.918944	0.3677
TOP	-1.03E-06	3.57E-07	-2.897131	0.0081
TOP(-1)	6.05E-07	4.16E-07	1.453371	0.1596
TOP(-2)	-5.38E-07	3.55E-07	-1.518698	0.1425

R-squared	0.506346	Mean dependent var	5.88E-05
Adjusted R-squared	0.291714	S.D. dependent var	9.84E-05
S.E. of regression	8.28E-05	Akaike info criterion	-15.70462
Sum squared resid	1.58E-07	Schwarz criterion	-15.21080
Log likelihood	277.9786	Hannan-Quinn criter.	-15.53621
F-statistic	2.359136	Durbin-Watson stat	2.576024
Prob(F-statistic)	0.043018		

EDUCATIONAL ADMINISTRATOR'S PERCEPTION ON MANAGING TEACHING AND LEARNING AFTER A NATURAL DISASTER: A CASE STUDY IN LIPIS, PAHANG.

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ABSTRACT

This study aimed to comprehend a comprehensive perception of educational administrators on managing teaching and learning after a natural disaster. In Malaysia, natural disaster is a common occurrence. Malaysia is affected by numerous natural disasters, such as floods, droughts, haze, and heat waves. These natural disasters have caused multiple issues for the country regarding its development, economy, education, and society. The occurrence of natural disasters has impacted education, which caused schools to be closed and school activities to be halted or cancelled altogether. In 2021, Malaysia has recorded 1057 cases of flood. This has resulted in a crisis in education since many schools have to be closed. Utilising qualitative design research that targeted informants consisted of heads of schools selected from various schools that are regularly affected by the flood. The informants consist of the heads of schools, such as the headmaster and the principal from a region in Pahang that is regularly affected by the flood. An in-depth semi-structured interview was used to collect data. Then, the obtained data were transcribed using thematic analysis, and themes were extracted to answer all research questions. The findings show the importance of support from various parties when managing teaching and learning after a natural disaster. It also highlighted the challenges that educational administrators face when managing teaching and learning after a natural disaster and interesting suggestions that can be considered to improve the situation in the future.

INTRODUCTION

Malaysia is a country that experiences numerous natural disasters every year. Malaysia's position, which is situated at the equator, causes Malaysia to be exposed to an ever-changing climate and unpredictable weather. Flood is one of the most common and frequent natural disasters that occur in Malaysia. In 2021 alone, there were 1057 cases of flood recorded in Malaysia. These cases have impacted the Malaysian economy, development, and education. Lately, natural disaster has garnered much attention from various parties, whether the government or private. The impact of natural disasters such as floods, earthquakes, landslides, and droughts is becoming a major concern because they can happen anytime and anywhere (Armin Subhani, 2016). Malaysia has enacted a policy that enables the country to manage its national disaster systematically and effectively. However, it still cannot escape natural disasters, especially floods that happen every monsoon season (Izzatie, 2022).

Problem Statement

Kuala Lipis is a district located in the state of Pahang in the eastern region of Malaysia. Kuala Lipis is on the receiving end of heavy rain, especially during the monsoon season. This has caused natural disasters, such as floods, to occur regularly in the district. From 2010 to 2022, there has been a recorded flood event almost every year except in 2012, 2016 and 2020. This flooding has caused severe loss and damage to the district. Apart from that, it also affected the everyday lives of people. The flood that occurs regularly disrupted

everyday activities such as school and work. Numerous schools in Kuala Lipis were affected by the flood. Nearly 50 schools were affected by floods in Kuala Lipis every year. These schools were either submerged by flood or had their transportation line severed. Among them are SMK Clifford, SK Kerambit, SK Jeram Landak, SMK Kerambit, SK Mela, and SK Kuala Medang. This has affected a significant number of students. In 2014, approximately 3000 students were affected by the flood due to the damages the school sustained after the flood.

The aftermath of the flood has caused many challenges to students, parents and teachers. This study will provide a better understanding of the perception of educational administrators when managing teaching and learning after a natural disaster. This study will provide solutions and suggestions on how to improve the situation in the future. Better guidelines and policies can be implemented to ensure that the education process is not affected by events such as floods in the future.

Research Objective

1. To comprehend the perception of educational administrators when managing teaching and learning after a natural disaster.
2. To further comprehend the issues that educational administrators face when managing teaching and learning after a natural disaster.
3. To grasp the methods taken by educational administrators in handling the challenges related to managing teaching and learning after a natural disaster.
4. To comprehend the significance of overcoming challenges in managing teaching and learning after a natural disaster.
5. To contribute improvements to the management of teaching and learning after a natural disaster.

Research Question

1. What are educational administrators' overall perceptions of managing teaching and learning after a natural disaster?
2. What issues do educational administrators face when managing teaching and learning after a natural disaster?
3. How do educational administrators handle challenges in managing teaching and learning after a natural disaster?
4. Why is it significant to overcome challenges in managing teaching and learning after a natural disaster?
5. How can one improve the management of teaching and learning after a natural disaster?

LITERATURE REVIEW

A natural disaster is a highly hazardous event that impacts communities, causes damage, disruption, and casualties, and renders the affected communities unable to function normally without outside assistance (Twig, 2007). A natural hazard is an atmospheric or hydrological and geophysical event (e.g., Flood or Drought, Earthquake, Tsunami, Landslip, Windstorm) that has the potential to cause harm or loss. A natural disaster is caused by nature that overpowers local resources and jeopardises the community's ability to function, and safety is referred to as a natural disaster. Disasters typically serve as the ultimate test of a community's ability to respond to emergencies. A well-planned and thoughtful emergency plan can swiftly respond to unexpected events and difficulties (March, 2002).

Malaysia is typically impacted by mild environmental disasters but seldom by major calamities. The frequency and severity of environmental disasters have increased in Malaysia. Tsunamis, floods, and landslides are environmental catastrophes that have affected this nation. However, disasters like tsunamis are unpredictable and fierce, making preparation and defence very challenging. Thus, the Hyogo Framework, a 10-year global plan for reducing the risk of natural disasters, was approved by 168 Governments in January 2005 (Haliza, 2014).

Flood is one of the most frequent natural disasters that occur in Malaysia. Flood is caused by climatology or climate, such as temperature, rain distribution, evaporation, wind movement and the earth's natural surface condition (Chan, 2015). Generally, a flood is the flow of the river water that is relatively bigger than regular circumstances. It is usually caused by rain that falls upstream or continuously in a particular area, causing overflow from the river channel and flooding the nearby area (Rejang, 2017).

Floods can be classified into several types, such as flash floods, mudflows, monsoon floods, coastal floods, urban floods, and dam rain floods. There are only a few types of floods that occur in Malaysia. These are flash floods, mudflows, and monsoon floods (Ang, 2019). Several factors cause floods in Malaysia: high tides, shallow rivers caused by the deposition process, and strong water flow caused by heavy rain or mudflow. Another reason for flood in Malaysia is the high volume of rain received every year. On average, Malaysia receives at least 2940 mm of rain a year, with the tabulation differing in each state. The difference in the rain pattern in each state causes floods in some states due to receiving a massive volume of rain over a prolonged time, which could go on for days (Jabatan Pengairan dan Saliran Malaysia Kementerian Sumber Asli dan Alam Sekitar, 2017).

The destruction caused by floods is not only recorded in Malaysia but all around the world. Flood has been stated as the third biggest natural disaster besides earthquake and volcanic eruption that causes the loss of life and the destruction of property (World Meteorology Organization, 2020). The frequent occurrence of floods in Malaysia has created a sense of uneasiness among citizens living in high-risk areas. Floods not only cause destruction and loss of property but also hinder everyday activities, which include education. Every time a natural disaster such as a flood occurs, it will cause school closure due to the school being directly affected by the flood, such as being submerged, or the school building being used as the flood victim relief centre. Due to this, those who are affected by flood must be informed, aware and ready about it to reduce its impact (Izzatie, 2022).

There is a need for more research to be carried out regarding floods in Malaysia. This is due to the frequent nature of it. In a speech on the 3rd March 2023, the Yang Dipertuan Agong of Malaysia, Al-Sultan Abdullah Ri'ayatudding Al-Mustafa Billah Shah Ibnu Al- Marhum Sultan Haji Ahmad Shah Al-Musta'in Billah, hoped that the government could research to identify the cause of flood in Pahang (Abdullah, 2023). This is to find both long- and short-term solutions. Related to education, there is a need to conduct a comprehensive study in order to prepare schools and institutions of learning better when dealing with floods in the future. There is only a minimal amount of study was carried out to understand the management of teaching and learning during a natural disaster, especially from the perspective of the academic administrator.

The impact of natural disasters can vary and be extremely extensive. Natural disasters will affect various aspects of our lives, including education. Natural disasters' main impact is towards the human capital of a country. It is widely debated that natural disasters can negatively and positively impact a country's GDP (Skidmore & Toya, 2002; Raddatz, 2007). Both sides take into account how the long-term effects of natural disaster shocks on capital (physical and human) damage could either reduce productivity or drive the replacement of outmoded capital with more modern technologies (Onigbinde, 2018).

A portion of the literature examines how mortality threats from natural disasters may reduce education spending in disaster-prone nations (Cuaresma, 2010). The 2005 Pakistan Earthquake resulted in the deaths of 853 teachers and 18,095 students, the destruction of more than 7,500 schools, and the failure of reconstruction efforts to rebuild capacity and educational infrastructure (Asian Development Bank and The World Bank, 2006).

Growth has been attributed in large part to education. According to labour productivity and social outcomes, human capital accumulation, described by investments in education, is a key driver of economic advancement (Barro & Lee, 2013). However, numerous natural disaster shocks may limit the abundance of highly educated human resources. The influence of hazards such as catastrophic shocks on household income, demography, policy change,

and others on educational achievements is one of the challenges that human capital accumulation faces. These results, measured by school enrollment and achievement, grade progression, academic performance, and others (UNDP, 2005), make it difficult for households and the government to decide whether to invest in human capital.

METHODOLOGY

This study utilised the qualitative method as the data collection method. The “why” and “how” of a phenomenon’s description and interpretation interest researchers in qualitative research. In order to shed light on the phenomenon, it employs a methodical methodology that directs the examination of a subject through natural and direct engagement with the informants. Qualitative research can investigate a range of human interests or points of view using interpretive and practical interviews. By examining the respondents’ subjective viewpoints, qualitative research seeks to make sense of the respondents’ experiences. It is a naturalistic method of conducting empirical research that precedes respondents’ viewpoints over the researcher’s (Boswell & Babchuk, 2022).

Case studies are a qualitative research method where a programme, event, activity, process, or one or more people are thoroughly investigated. Researchers gather comprehensive data over an extended period, utilising various data collection techniques for the case(s) that are constrained by time and activity (Priya, 2020). A case study is an empirical investigation examining a phenomenon’s actual setting. As case study research entails an in-depth examination of a phenomenon, many data collection techniques are used. It must be underlined that, as Yin (2009) pointed out, a case study is not a technique for gathering data but rather a plan or strategy for researching a social unit.

Justification for Selection of Lipis as Case Study

Lipis is a district in the state of Pahang on the east coast of Malaysia. The east coast of Malaysia is a frequent receiver of heavy rain during the monsoon season, and this has caused frequent flooding in the district. Lipis experience floods every year, and this has caused numerous challenges for the resident. Every year, numerous schools in Lipis is affected by flood. In 2014, the flood caused all schools in Kuala Lipis, the capital of Lipis, to close, and they faced many difficulties in restarting the school due to the extensive damage caused by the flood. Due to this reason, Lipis was selected to conduct this study.

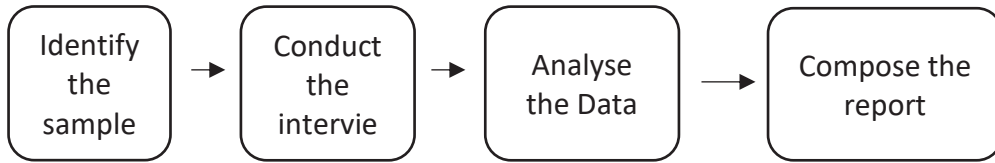
Sample Selection

The samples for this study were selected among school administrators in Lipis. The purposive sampling method was utilised in this study. The samples were selected from those with administration positions in the schools affected by the flood. Principles, headmaster and Guru Penolong Kanan satu (GPK 1) were selected as samples since they are responsible for the academic aspect of the schools. They are in charge of all things related to academics. The principal and headmaster are in charge of all aspects of a school administration. Meanwhile, GPK 1 is in charge of handling the curriculum aspect of administration. Due to this reason, the samples for this study were selected.

The Interview Procedure

A semi-structured interview was conducted in order to obtain the data. Ten subjects were interviewed in this study. All of them are school administrators from various schools in Lipis that were affected by the flood. The interviewer asks six questions to answer the five research questions. To ensure the validity of the interview questions, the questions were checked by an expert. The interview was conducted in Bahasa Malaysia. The main reason for this was to make sure that the subject would understand the question better and avoid any confusion regarding the matter that was up for questioning. The researcher provided the explanation in Bahasa Malaysia, and the data obtained from the interview will be translated into English. To avoid the data from being misinterpreted, the data was

checked by an English language lecturer. The data is then checked by another expert in the field of education management. This is to ensure the validity of the data.



DATA ANALYSIS

Thematic analysis was utilised in this study to analyse the data. The finding of the research discovers five themes. The themes are based on the research questions.

Research question 1: What are educational administrators' overall perceptions towards managing teaching and learning after a natural disaster?

Theme 1: Managing teaching and learning after a natural disaster is challenging.

Sub-theme 1: Due to the damages, it takes time to restart teaching and learning after a natural disaster.

Sub-theme 2: Students were unprepared to begin learning due to the loss of all the basic school necessities.

Research question 2: What issues do educational administrators face when managing teaching and learning after a natural disaster?

Theme 2: The damages sustained by the school cause the teaching and learning process to be halted or delayed.

Sub-theme 1: Teachers fall behind in their syllabus, and there is no alternative for them to conduct lessons.

Sub-theme 2: Students were left behind in education because their parents could not afford to send them to school.

Research question 3: How do educational administrators handle challenges in managing teaching and learning after a natural disaster?

Theme 3: Help from other parties is needed to handle the challenges of teaching and learning after a natural disaster.

Research Question 4: Why is it significant to overcome challenges in managing teaching and learning after a natural disaster?

Theme 4: To ensure that teaching and learning can resume as usual in the future in the aftermath of a natural disaster.

Sub-theme 1: Natural disaster has become more unpredictable in recent times and has become more frequent.

Research Question 5: How can one improve the management of teaching and learning after a natural disaster?

Theme 5: The government must develop guidelines and frameworks for teaching and learning after a natural disaster.

Sub-theme 1: Collaborative efforts from relevant parties such as BOMBA, JPAM, TNB and KPM are needed to manage the aftermath of a natural disaster better.

Sub-theme 2: Local communities and organisations such as PIBG and JKK must be included in the crisis management planning.

Theme 1: Managing teaching and learning after a natural disaster is challenging.

Theme 1 discusses the overall perception of school administrators when managing teaching and learning after a natural disaster. All subjects agree that managing teaching and learning after a natural disaster is very challenging. Informant 01 said that

“Pada pendapat saya sebagai pentadbir sekolah rendah mengenai pengurusan pembelajaran dan pengajaran selepas bencana alam, amatlah mencabar. Saya terpaksa menangani pelbagai masalah yang timbul akibat daripada banjir”

Sub-theme 1: It takes time to restart teaching and learning after natural disaster due to the damages.

Half of the subjects (5) stated that restarting teaching and learning after a natural disaster takes time. Informant 02 described how trying to restart the lesson is so challenging due to the enormous damage caused by the flood:

“The damages sustained by my school, which was completely submerged during the flood, caused teaching and learning to be halted. We spent much time cleaning the classroom and replacing all the appliances such as fans, table and whiteboard. Benda-benda ni penting untuk pembelajaran dan pengajaran.”

Sub-theme 2: Students unprepared to begin learning due to the loss of all the basic school necessities.

Three subjects noted that most students affected by the flood do not have the capacity nor the resources to procure the basic necessities required to get back to school. Informant 06 explained how socioeconomic status affected the ability of some families to obtain basic school supplies:

“Some families here are from the low-income status, so buying all the necessities for school becomes secondary since they need to spend it elsewhere. Most of them focus on rebuilding their life first by fixing their house. They have to wait for a while to get all the basic school necessities, and this caused their lesson not to begin properly.”

Theme 2: The damages sustained by the school cause the teaching and learning process to be halted or delayed.

Theme 2 discusses the main challenges that academic administrators face when managing teaching and learning after a natural disaster. Most subjects stated that the main challenges they faced were the delayed teaching and learning caused by the damages sustained due to the flood. Informant 01 stated:

“We cannot start class because the classroom was severely damaged. The flood damaged all the appliances, such as table, desk, whiteboard, fan and lamp. Apart from that, some of the classrooms were declared unsafe by TNB and JKR even though they were cleaned. It would take months for the classroom to be ready, and this causes teachers to find other alternative venues to use as a classroom, such as the canteen and science lab. In my school, we have to use an open space in our assembly field as a classroom.”

Sub-theme 1: Teachers fall behind in their syllabus, and there is no alternative for them to conduct lessons.

Two subjects stated that several of their teachers struggle to keep up with the teaching syllabus. They noted that the teachers lacked guidance and capacity to conduct lessons due to the issues caused by the flood. Informant 07 explained:

“Some of my teachers are completely clueless about conducting the lesson; they come to me asking about the syllabus left behind due to the flood. We also have no idea how to conduct classes because we cannot do online classes.”

Sub-theme 2: Students were left behind in education because their parents could not afford to send them to school.

Three subjects mentioned that another challenge they faced was that some students could not attend school and class due to their financial restrictions. In certain areas, some families with very low incomes could not provide the necessary tools for their children to go to school. Informant 06 explained:

“Most of our students come from families with low-income status, so when flood hit their home, they lost almost everything. These families struggled to get back on their feet and focused more on rebuilding their lives. This caused them to neglect their children’s education since they deemed it secondary to their life objectives. Trying to get the students to return to school proves to be very challenging.”

Theme 3: Help from other parties is needed to handle the challenges in teaching and learning after a natural disaster.

Six subjects stated that assistance from other parties was needed to handle the challenges of managing lessons after a natural disaster. Assistance from the relevant parties, such as JKR, BOMBA, TNB and KPM, is essential in ensuring that the lessons can resume quickly and effectively. Informant 04 noted:

“Assistance from JKR, BOMBA, TNB and KPM was very important because without the assistance from these parties. Without the parties, we cannot get the classes ready for lessons. BOMBA are essential in the cleanup; meanwhile, JKR and TNB ensured the building is safe and ready to be used.”

Theme 4: To ensure that teaching and learning can resume as usual in the future in the aftermath of a natural disaster.

Five of the subjects explained that the significance of managing teaching and learning is to make sure that the lesson can resume quickly. They emphasise the importance of resuming the lesson quickly, as students and teachers will be affected if the lessons are delayed much longer. Informant 02 stated:

“Why do we need to manage teaching and learning after a natural disaster so the lesson can resume as soon as possible. This is because the more we delay, the more issues will come up, such as falling behind on the syllabus, especially for forms 5 and 3, students dropping out due to being out of school for too long and so on.”

Sub-Theme: Natural disaster has become more unpredictable in recent times and has become more frequent.

Four of the subjects have also noted that the frequency and severity of natural disasters have increased significantly over the years. This has made the preparation for these events much more difficult due to the unpredictable nature of it. Informant 09 stated:

“Back in the day, we could predict when the flood would happen due to the monsoon season. It usually occurs during the school break in December, which allows us to prepare better, but floods can happen anytime. For example, in 2021, the flood that hit my school happened in February and lasted for two weeks. We were completely unprepared for it, which caused many issues, especially with the lessons that were delayed.”

Theme 5: The government must develop guidelines and frameworks for teaching and learning after a natural disaster.

Most of the subjects (7) stated that the government must develop new and updated guidelines for managing teaching and learning after a natural disaster. Due to the recent

changes in the weather pattern and technological advancement, there is a need to update the guidelines and introduce a new one. Informant 10 explained :

“Government bodies such as KPM need to update and introduce new guidelines on managing teaching and learning after a natural disaster. Back then, floods didn’t affect students’ lessons much because they happened during the school break, but now it happens anytime. Updating new guidelines, such as introducing new teaching methods, such as the application of technology, will help teachers and administrators manage teaching and learning better after a natural disaster.”

Sub-Theme: Collaborative efforts from relevant parties such as BOMBA, JPAM, TNB and KPM are needed to manage a natural disaster’s aftermath better.

Four subjects also noted a need for a more comprehensive collaboration plan between the school and other relevant parties, such as JKR, TNB and PPD, to help them manage teaching and learning after a natural disaster. These relevant parties ensure the school can function normally after the natural disaster. Informant 03 noted:

“We need to have a plan that involves other relevant parties, such as JKR, TNB, BOMBA and PPD. These parties play a crucial role in ensuring the school can resume its activity. We need a collaborative plan so that the response time from these agencies can be quicker and more coordinated”.

Sub-Theme: Local communities and organisations, such as PIBG and JKK, must be included in the crisis management planning.

Three subjects stated the importance of local communities and organisations, such as PIBG and JKK, in helping the school manage lessons after a natural disaster. Informant 09 stated:

“My school is fortunate that our local community and PIBG were very involved in anything the school does. The local villagers were the ones who informed the school administrator about the situation, and they were also the ones who helped move all the essential items to a higher ground. With the villager’s help, my school could avoid a bigger loss in equipment such as computers, printers and other appliances. PIBG organised a gotong-royong after the flood subsided and provided some funds to the severely affected students.”

DISCUSSION

The finding of this study found that there is a need to create a procedure and guidelines on how to manage teaching and learning after a natural disaster. The changes in weather patterns have created a need to revise and review the current policy on managing teaching and learning after a natural disaster. Even though most of the administrators in Lipis have become accustomed to frequent floods, they admit that the recent event has become severe and unpredictable. The study also unveiled a need for more collaboration and coordination with several government agencies to better manage teaching and learning. Furthermore, the researchers also revealed a need for a more comprehensive assessment of the impact of the floods towards several schools in Lipis in the future. There is a possibility that the impact of the floods in Lipis will become much more severe in the future if we look at the current weather trend.

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AN INVESTIGATION OF THE RELATIONSHIP BETWEEN TEACHERS' TEACHING AND STUDENTS' LEARNING STYLES IN THE ENGLISH AS A FOREIGN LANGUAGE CLASSROOM: A CASE STUDY OF THAILAND'S METROPOLITAN AREA

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ABSTRACT

Learning styles are the characteristics that can influence learners' behaviour and ability to participate in the classroom. Additionally, teaching styles are teachers' behaviour in conducting the classroom's activities. The current study investigated the (mis)matching between teachers' teaching and students' learning styles in the Thai EFL high-school classroom context. The participants of 12 EFL classrooms consisted of 410 Thai EFL students (95 per cent of the population from 12 classrooms) and 7 EFL teachers. The instrumentation by Grasha-Riechmann Student Learning Style Scales and Grasha-Riechmann Teaching Style Inventory was used to investigate the level of students' learning and teachers' teaching styles. Then, a semi-structured interview was conducted with 82 EFL students (20% of the total participants) and 7 EFL teachers to investigate their perspectives. As a result, the three highest levels of learning styles among Thai EFL students were Avoidant, Competitive, and Collaborative. Meanwhile, a high school's three highest levels of Thai EFL teachers were Delegators, Personal Models, and Formal Authority. Regarding mismatching, the results of surveys and semi-structured interviews showed some mismatches between learners' expectations and the Facilitator's teaching style. Additionally, many teachers voiced concerns about avoidant learners during the interviews. The findings of this study have practical implications for education. To empower teachers and students, educators must understand their differences by enhancing student engagement, facilitating individualised instruction, adapting assessment practices, promoting metacognition, and supporting self-regulated learning. In other words, educators can create a more inclusive and effective learning environment, ultimately benefiting student learning outcomes.

Keywords: (mis)matching, learning styles, teaching styles, Thai EFL classroom

INTRODUCTION

Learning styles can be defined as personal characteristics that can influence not only the learner's behaviour but also their ability to acquire information, interact with peers and teachers, and participate in different learning activities (Grasha, 1994). Learning style is the student's preferred method to acquire information or experiences in the learning process (Grasha, 1996). Thus, the styles are an individual's way of receiving, perceiving, processing, and retaining information for future use.

Together with the learning styles of students, many researchers also investigated teaching styles. For example, Kuchinskas (1979), later confirmed by Artvinli (2010), pointed out that teaching styles are the leading factors that shape and assure the success of a highly complex teaching-learning process. In this regard, Grasha (2002) defined teaching styles as teachers' continuous and consistent behaviours in their interactions with students during the teaching-learning process. Like learning styles, teaching styles are not concrete and can be modified with time and new experiences.

Regarding matching or mismatching teachers' teaching styles with the student's learning styles, Brown (2000) concluded that when students' learning styles match with appropriate teaching

preferences, the student's motivation, performances, and, thus, achievement increases. Therefore, EFL teachers and administrators must consider the student's learning preferences and teaching styles, which show their favoured learning styles. Without this knowledge, clashes or Mismatches between teaching and learning preferences would affect students' learning potential and attitudes toward learning, leading to many problems such as low motivation or even burning.

The current problems of teaching and learning preferences in Thailand include the negative outcome of Thai students' language proficiency. According to Khamkhien's (2010) study indicated that Thai EFL classrooms are often teacher-dominated. In addition, most of the students' learning behaviours are passive (Wiryachitra, 2002). In detail, the main purpose of teaching and learning in Thai classrooms is to pass national and university admission examinations. Thus, lessons in schools focus heavily on content rather than actual communication, students' needs, or learning styles. As a result, teachers are viewed as the sole source of knowledge and become the centre of the classroom. At the same time, many students are active learners who can learn better in collaborative or active classrooms. Thus, these issues are caused by a mismatch between teaching and learning styles in Thai EFL schools. The findings will suggest good pairs of teaching and learning styles to provide a better teaching-learning environment.

The purpose of the study

The topic of study was chosen based on two reasons. The researcher would like to encourage Thai educators to be aware of the importance of teaching and learning preferences among Thai EFL teachers and students. In addition, the researcher would like to identify the potential to (mis)match these variables to promote effective teaching and learning. Hence, the current study emphasises the benefits of knowing teaching and learning preferences.

Additionally, making students aware of their learning styles and showing them their strengths and weaknesses can help them understand why learning is sometimes difficult. Lastly, students can be supported by matching their teaching and learning preferences. Providing students with learning materials, styles, and activities that suit their preferred ways of learning can make it easier for them.

The previous studies conducted in the Thai context have yet to identify students' and teachers' needs. Also, there is the potential to match or mismatch teaching and learning preferences, especially in high school contexts. Then, this study aims to identify the preferences of teaching and learning styles among Thai EFL high school teachers and learners.

Research questions

1. Do EFL students have different learning styles based on the Grasha-Riechmann Learning Style Scale?
2. Do teachers have different teaching styles in EFL based on Grasha's Teaching Style Survey?
3. Is there any relationship between the teachers' and students' teaching and learning preferences?

LITERATURE REVIEW

Learning Styles

Grasha (1994) defined learning styles as personal characteristics that can influence not only the learner's behaviour but also their ability to acquire information, interact with peers and teachers, and participate in different learning activities. In other words, learning style is the student's ability to obtain information with learning experiences (Grasha, 1996). Briefly, gaining knowledge of students' learning styles can be

very helpful for both teachers and learners. To increase learning motivation and effectiveness, learners may investigate their self-learning styles to adjust their learning environment. Also, Grasha and Reichmann (1974) underlying the characteristics of learning styles into six categories: independent, avoidant, collaborative, dependent, competitive, and participant,

Independent learner is a student who likes to think for themselves and is confident in their learning abilities. They prefer learning the content they feel is important and working alone on course projects rather than with other students. This type of learner prefers the classroom, which provides independent study, self-paced instruction, assignments that give students a chance to think independently, projects that students can design, and student-centred rather than teacher-centred course designs. The advantage of independent learners is that they can develop skills as self-initiated, self-directed learners, whereas they need to improve in collaborative skills. They, however, may fail to consult with others or ask for help when needed.

A dependent learner is a learner who shows little intellectual curiosity and only learns what is required. They view teachers and peers as sources of structure and support and look to authority figures for specific guidelines on what to do. They can learn best in a classroom that provides outlines or notes on the board, clear deadlines and instructions for assignments, teacher-centred classroom methods, and as little ambiguity as possible in all aspects of the course. The advantages of dependent learners can help them manage their anxiety and obtain clear directions. However, developing skills for exhibiting autonomy and self-direction as a learner is difficult. They do not learn how to deal with uncertainty.

A competitive learner is a student who learns material to perform better than others in the class. They believe they must compete with other students in the course to receive the rewards offered, as they enjoy being the centre of attention and receiving recognition for their accomplishments in class. This type of learner is a group leader in discussions; they tend to learn best with teacher-centred instructional procedures, singled out for doing a good job, and in-class activities where they can do better than others. The advantages are that learners can motivate themselves to keep up and set learning goals. However, they may turn less competitive people off, and style makes it more difficult for people to appreciate and learn collaborative skills.

Participant learner is a type of good learner in class. They enjoy attending class and participating in as many course activities as possible and are typically eager to do as many required and optional course requirements as possible. Participant learners can learn best with discussion classes, which provide opportunities to discuss material, class reading assignments, and teachers who can analyse and synthesise information sufficiently. The advantage of this type of learner is that they can get the most out of every classroom experience, but they may need to do more or put others' needs ahead of their own.

A collaborative learner is a typical student who feels they can learn by sharing ideas and talents. They cooperate with teachers and like to work with others. They prefer the classroom, such as lecturing with small group discussions, small seminars, student-designed aspects of courses, and group projects. The advantage of this is that learners can develop skills for working in groups and teams. However, they need to prepare to handle competitive people, and they tend to depend too much on others and are only sometimes able to work alone.

An avoidant learner is a learner who could be more enthusiastic about learning content and attending class. They do not participate with students and teachers in the classroom and need to be more interested and overwhelmed by what happens in the class. They prefer the style, which is generally turned off by most classroom activities, would prefer no tests or pass-fail grading systems, do not like enthusiastic teachers, and do not want to be called on in class. The advantages of this type of learner are

that they can avoid the tension and anxiety of taking serious steps to change their lives. Moreover, this type of learner prefers enjoyable but less productive tasks. However, negative feedback is another reminder of their failings and keeps them from setting productive goals.

Teaching Styles

In 2002, Grasha defined teaching style as the continuous and consistent behaviours of teachers in their interactions with students during the teaching-learning process. In contrast, Peacock (2001) defined the second language teaching style as the instructor's natural, habitual, and preferred way of presenting new information and teaching language skills in the classroom.

Grasha (1994) conducted a research study to observe college classroom teaching and identify five teaching styles: expert, formal authority, personal model, facilitator, and delegator. The details have been concluded as follows:

Expert teachers are the ones who deal with transmitting detailed knowledge and try to maintain their status as experts among the students. Moreover, they are concerned with offering detailed knowledge and information to ensure that students are well-prepared. In classroom activities, expert teachers mostly transmit information and provide explanations. Therefore, the advantages of expert teachers are the source of information, knowledge, and skills such individuals possess. However, if the information, knowledge, and abilities are overused, the display of knowledge can intimidate less experienced students. In addition, they only sometimes show the underlying thought processes that produce answers.

The formal authority provides positive and negative feedback, mainly concerned with the correct, acceptable, and standard ways of learning. In other words, they are concerned with giving positive and negative feedback and establishing student learning goals, expectations, and rules of conduct. Moreover, they are serious about the correct, acceptable, and standard ways to do things and provide students with the structure they need to learn. The advantages of this type of teacher are that they focus on clear expectations and acceptable ways of doing things. In contrast, their strong investment in this style can lead to rigid, standardised, and less flexible ways of managing students and their concerns.

The facilitator mainly focuses on the interaction between student and teacher, and they are expected to guide students through asking questions, making suggestions, and encouraging cooperative and independent activities. As they emphasise the personal nature of teacher-student interactions, these teachers aim to develop students' capacity for independent action, initiative, and responsibility. Therefore, they work with students on projects in a consultative fashion and provide as much support and encouragement as possible. The advantages of facilitator teachers are personal flexibility, the focus on students' needs and goals, and the willingness to explore options and alternative courses of action. However, this style is often time-consuming and is sometimes employed when a more direct approach is needed. This type of teacher can make students uncomfortable if it is not used positively and affirmatively.

The personal model is a type of teacher who believes in "teaching by personal example" and establishes a prototype for thinking and behaving. They can oversee, guide, and direct by showing how to do things, encouraging students to observe, and then emulating the instructor's approach. They can emphasise direct observation and following a role model. Nevertheless, some teachers may believe their approach is the best way, leading some students to feel inadequate if they cannot live up to such expectations and standards.

Delegators are concerned with developing independent learning and encourage students to work independently on projects or as part of teams. This type of teacher lets their students work independently on projects or as part of autonomous teams. The teacher is available at the request of students as a resource person. The advantages of delegator teachers can help

students to perceive themselves as independent learners. However, teachers may need to read students' readiness for independent work in this style, and some may become anxious when given autonomy.

To identify EFL students' learning styles, this study adopts Grasha-Riechmann's Learning Style Scale (Riechmann & Grasha, 1974), which mainly focuses on students' perceptions regarding actual classroom activities and interactions between students and teachers rather than an assessment of personality or cognitive traits. Each learning style will suit different teaching styles (not only one).

In addition, the present study determines teachers' teaching styles through the Teaching Style Survey by Grasha (1994). Teaching styles are divided into five categories, which describe teachers as authority, expert, facilitator, personal model, and delegator. Each teaching style has different characteristics that could influence learners with different learning styles.

METHODOLOGY

A mixed methods research design was conducted. A quantitative survey approach and semi-structured interview were adopted in the study to describe perspective via participants' teaching and learning styles. Regarding (mis)matching analysis, the descriptive analysis was used to analyse teaching and learning preferences among teachers and students. The comparison between current teachers' and learners' styles and preferences was revealed as numbers and percentages to identify (mis)matching between them.

Participants

The current study was conducted in a Thai high school in the Greater Bangkok area. The sample of this study was 12 classrooms, which consisted of 410 students and 7 teachers who were studying-teachings in actual EFL classrooms. The online survey (Google Form) was sent to each classroom consisting of approximately 410 students studying and 7 teachers of English in this public high school at the time of data collection.

Moreover, the semi-structured interview was conducted with all teachers and 82 students (20 per cent of students from each classroom selected by a simple random sampling technique). In detail, teachers and students were interviewed individually to ask about their perspectives on their teaching/learning and their attitude toward their students/teachers.

Instruments

Grasha-Riechmann Student Learning Style Scales (GRSLSS) were used to gain data about student's preferences in their learning style. The GRSLSS (Grasha, 1996; Hruska-Riechmann & Grasha, 1982) was widely used in various studies to determine students' learning styles. The questions in the GRSLSS related to attitudes and feelings toward past courses based on a 5-point Likert-type. The score range of 1 and 5 was given for each of the following categories: (a) independent (10 items), (b) dependent (10 items), (c) competitive (10 items), (d) collaborative (10 items), (e) avoidant (10 items), and (f) participative (10 items).

The Grasha-Riechmann Teaching Style Inventory (GRTSI) was used to measure the level of teacher's teaching preference, and it was adopted in the study. The GRTSI is a self-reporting tool containing the five different teaching styles for each of the following categories: (a) expert style (8 items), (b) formal authority style (8 items), (c) personal model style (8 items), (d) facilitator style (8 items), and (e) delegator style (8 items).

Semi-structured interview. After the surveys were completed, teachers and students were interviewed individually based on two or three questions that asked for their perspectives on their teaching/learning and their perspectives on their students/teachers. The preferred opponents' styles. The answers to both open-ended questions provide an opportunity for

identifying new ways of seeing and understanding the topic. The interviews were audio-recorded and transcribed as text for analysis.

The statistical value of Cronbach's alpha of teachers' teaching style is 0.81. At the same time, the value of Cronbach's alpha of students' learning styles is 0.89.

Data Analysis

The learning styles of all participants were determined by mean scores based on the low, moderate, and high scales of the Grasha-Riechmann Learning Style Survey, presented in Table 1 for each learning style.

Table 1

Low, moderate, and high scales of the Grasha-Riechmann Learning Style Survey

Learning Styles	Range					
	Low Scores		Moderate		High Score	
Independent	1.0	- 2.7	2.8	- 3.8	3.9	- 5.0
Avoidant	1.0	- 1.8	1.9	- 3.1	3.2	- 5.0
Collaborative	1.0	- 2.7	2.8	- 3.4	3.5	- 5.0
Dependent	1.0	- 2.9	3.0	- 4.0	4.1	- 5.0
Competitive	1.0	- 1.7	1.8	- 2.8	2.9	- 5.0
Participant	1.0	- 3.0	3.1	- 4.1	4.2	- 5.0

Teachers' teaching styles were determined by mean scores based on the low, moderate, and high scales of the Grasha-Riechmann Teaching Style Survey, presented in Table 2 for each teaching style.

Table 2

Low, moderate, and high scales of the Grasha Teaching Style Survey

Teaching Styles	Range		
	Low Scores	Moderate	High Score
Expert	1.0 - 2.3	2.4 - 3.3	3.4 - 5.0
Formal Authority	1.0 - 2.8	2.9 - 3.8	3.9 - 5.0
Personal Model	1.0 - 3.0	3.1 - 4.0	4.1 - 5.0
Facilitator	1.0 - 2.6	2.7 - 3.8	3.9 - 5.0
Delegator	1.0 - 1.8	1.9 - 3.0	3.1 - 5.0

Then, the mean scores from the questionnaire were examined to categorise students' learning styles and teachers' teaching styles based on the ranking scales. In the final stage, the results from students from each class revealed the main learning styles of each class that were compared with English teachers' teaching styles.

RESULTS

Students' Learning Styles

Table 3

Mean Score of EFL high school students learning styles (n=410)

	M	S.D.	Rank
Independent	3.51	0.99	Moderate
Avoidant	3.44	1.1	High
Collaborative	3.55	1.04	High
Dependent	3.5	1.04	Moderate
Competitive	3.07	1.22	High
Participant	3.49	1.09	Moderate

Table 3 shows that Thai EFL students' most common learning styles were avoidant, collaborative, and competitive, as those styles were found to be higher than others.

To deeply understand learning styles among Thai EFL learners, students have been asked about their feelings and perspectives while learning English in the classroom. Also, teachers have been interviewed to ask about their views on their students' learning characteristics in the classroom.

Student self-report

The Findings from the semi-structured interview among Thai EFL learners revealed students' feelings and opinions toward their teachers and learning environment as follows:

"I prefer teachers who only sometimes speak English; it is boring. Then, I lose my concentration." (*Avoidant student participant, Classroom 2*)

"Honestly, I am not good at English, even basic. Teachers mostly want me to speak English in the classroom, but I cannot. That's why I always feel pressure to study English, especially teachers who want me to speak." (*Collaborative-Avoidant student participant, Classroom 3*)

"I know the answer but do not want to answer just because my peers do not. Then, I always keep silent whenever I study English." (*Collaborative-Dependent student participant, Classroom 5*)

Teachers report

Findings from the semi-structured interview sessions revealed that many teachers agreed that Thai EFL students were considered avoidant if they could not understand English. Sample responses given by the participants are as follows:

"Many students in the school are avoidant. What would you do in English classrooms where English is used 100% as a means of communication if you needed help understanding English? You would not feel interested at all, and you would become the avoidant type of learner." (Teacher 4)

"Based on my observation, the whole reason why students in Thailand were avoidant was that they needed to see the importance of English in everyday life." (Teacher 6)

"In the classroom, some of the students are avoidant learners. I did not blame the students, but sometimes they could not understand what I said" (Teacher 2)

Teachers' Teaching Styles

Table 4

Total Mean Score of EFL Teachers teaching styles (n=7)

Teaching Styles	M	S.D.	Rank
Expert	3.50	0.49	High
Formal Authority	3.47	0.45	Moderate
Personal Model	4.17	0.23	High
Facilitator	4.16	0.5	High
Delegator	3.67	0.43	High

According to Table 4, seven teachers teaching English subjects in those 12 classrooms reported their preferred teaching styles, as determined by the total mean scores, SD, and rank scale (based on Grasha's Teaching Styles Criteria). The findings revealed the teaching styles: Personal Model, Facilitator, Delegator, and Expert, respectively. The Formal Authority style was the least preferred teaching style among EFL high school teachers.

However, When the researcher grouped the teaching styles into clusters, according to the ranking Score, it was found that the most common teaching styles among Thai high school EFL teachers were Expert-Formal Authority-Personal Model-Delegator (n=2), Expert- Formal Authority- Personal Model- Delegator (n=2), Formal Authority- Personal Model- Delegator (n=1), Expert-Formal Authority-Personal Model-Delegator (n=1) and Formal Authority-Personal Model-Facilitator-Delegator (n=1). The results are presented in Table 5.

Table 5

Mean Score of teaching styles as Reported by teacher participants

Teacher Number	Expert		Formal Authority		Personal Model		Facilitator		Delegator	
	M	Rank	M	Rank	M	Rank	M	Rank	M	Rank
Teacher 1	3.67	High	2.89	Moderate	4.33	High	4.67	High	4.33	High
Teacher 2	3.89	High	3.23	High	4.56	High	4.00	Moderate	4.00	High
Teacher 3	3.44	High	3.78	High	3.89	High	3.33	Moderate	3.33	High
Teacher 4	4.00	High	3.78	High	4.11	High	4.22	High	4.00	High
Teacher 5	2.56	Low	3.44	High	4.22	High	4.78	High	3.11	High
Teacher 6	3.78	High	3.33	High	4.00	High	3.89	Moderate	3.56	High
Teacher 7	3.67	High	4.22	High	4.33	High	4.56	High	3.56	High

(Mis)matching between teaching and learning styles.

Expectations for teachers' teaching styles

To identify (mis)matching between teaching and learning preferences among teachers and students, both students and teachers were asked about their expected teaching and learning styles. Therefore, the data from the student questionnaire have been summarised (see Table 6)

Table 6

The teaching styles expected from each classroom and their desired teaching styles

Participants	Teachers' Styles Expectation (f)	Percentage (%)	
Total Students (n=410)	Expert	46	11.22
	Formal Authority	58	14.15
	Personal Model	80	19.51
	Facilitator	121	29.51
	Delegator	105	25.61

The following statement shows an example of students' opinions that have been asked via an interview about their reasons for selecting the expected teaching styles.

The reasons for selecting an expert teaching style

"It is easy to follow the instruction from teachers or just listen to their lectures. No need to think a lot, no need to do lots of activities" (Student participant, classroom 1)

"Teachers will assign the work or do a lecture in the classroom, and I just write what they said; there is no need to do something tired in the classroom." (Student participant, classroom 1).

The reasons for selecting a formal authority teaching style

"It seems like this kind of teacher gives me the freedom to think outside the box; I feel flexible to think" (Student participant, classroom 7).

The reasons for selecting a personal model teaching style

"I would love to see the example from teachers so I can follow it easily and make fewer mistakes." (Student participant, classroom 5).

"In an English classroom, if the teacher has a good example, students will know how to do. For example, if the teacher has good accent and pronunciation, students can pronounce the word correctly." (Student participant, classroom 6).

The reasons for selecting a facilitator teaching style

"I prefer a teacher who gives me a task or activity to do in the classroom." (Student participant, classroom 11).

"I feel more comfortable to work without teachers looking at me. It is no pressure to do, and it makes me feel free. If I have questions, I will ask but do not press me up!" (Student participant, classroom 3).

The reasons for selecting a delegator teaching style

"It is good to think by ourselves because everyone has internet, we can do work by ourselves just follow the task instruction." (Student participant, classroom 4).

"I believe that sometimes we can work best without teachers telling us what to do" (Student participant, classroom 4).

Expectations for students' learning styles

Teacher participants were interviewed about their expectations of their student's learning styles and the reasons. The following statement shows a summary of the interview sessions.

Teacher 1 expected collaborative learner

"Most of the effective work will be done by group work. When students work together, they can share an idea."

Teacher 2 expected participant learner

"As I am teaching conversation classroom. I involve my students to participate in my class so participant learners can enjoy my class, not only learning about something but also practising what they learn."

Teacher 3 expected competitive learner

"I love students who answer questions in the classroom. They understand and concentrate on the lesson."

Teacher 4 expected competitive learner

"I have no difficulty with competitive learners because they know how to interact with teachers and speak English well in my class."

Teacher 5 expected independent learner

"I prefer students who can think independently and apply their knowledge in authentic situations."

Teacher 6 expected competitive learner

"It is easy to motivate them just by giving them praise or positive feedback in competition; it will drive them to do better."

Teacher 7 expected independent learner

"I prefer students who can learn by themselves because the best way of learning is by themselves."

To sum up, the most learning styles that teachers expected from high school students were Competitive Learning styles ($f=3$, 42.86%), Independent Learning styles ($f=2$, 28.57%), Collaborative Learning styles ($f=1$, 14.29%), and Participant Learning styles ($f=1$, 14.29%), respectively.

Comparison between current teachers' and learners' styles and their preferences.

The number of both groups' participants is shown to identify matching and mismatching between teaching and learning styles based on participants' preferences. (See Table 7 and 8; Figure 1 and 2)

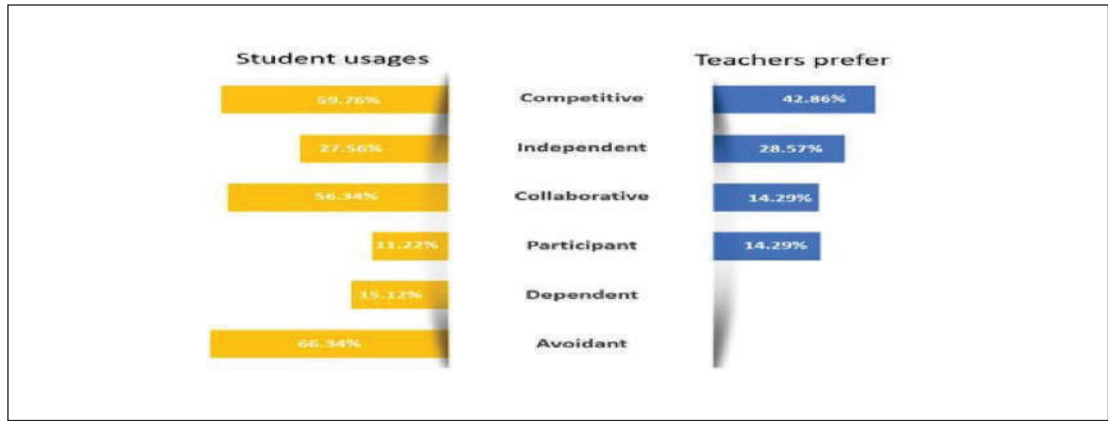
Table 7

The current learning styles, number of students' usages and teachers prefer

Learning Styles	Students' usages		Number of teachers' preferences	
	n	Percentage	(n=7)	Percentage
Competitive	245	59.76	3	42.86
Independent	113	27.56	2	28.57
Collaborative	231	56.34	1	14.29
Participant	46	11.22	1	14.29
Dependent	62	15.12	0	0
Avoidant	272	66.34	0	0

Figure 1

The current learning styles, number of students' usages and teachers' preferences



According to Table 7 and Figure 1, the most matching of teachers' expectations to learners' learning styles is the Competitive learning style, which three teachers (42.85%) prefer, and 245 students (59.76%) use this style. The second-ranking preferred is the Independent learning style, which two teachers (28.57%) prefer, and 113 students (27.56%) use this learning style. The third-ranking preferred the same number, which is the Collaborative learning style (14.29%) has 231 students using this style (56.34%), and the Participant learning style (14.29%) has 46 students (11.22%) using this style.

On the other hand, the learning styles that teachers do not prefer are Dependent learning style and Avoidant learning style. In contrast, the most used learning style among Thai EFL students is avoidant, accounting for 66.34% of the total.

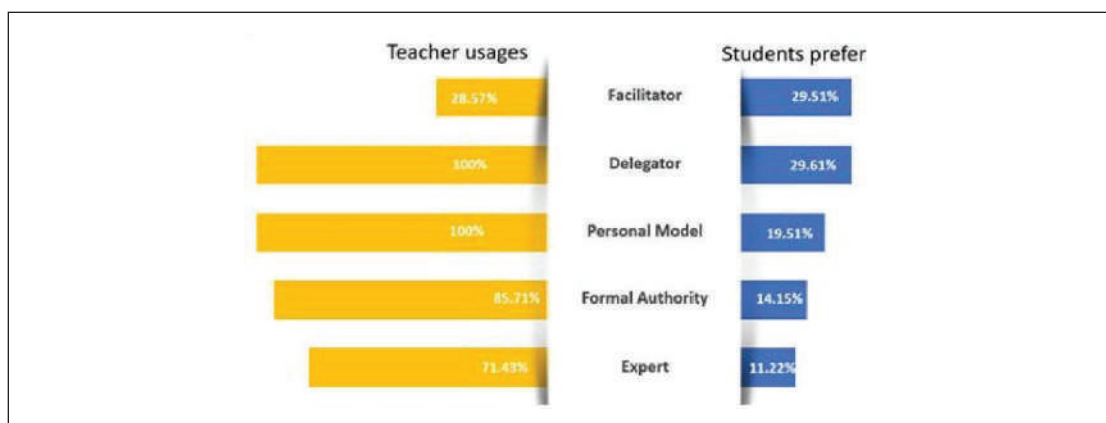
Table 8

The current teaching styles, number of teachers' usages and students' preferences.

Teaching Styles	Number of Teachers' usages		Number of students' preferences (n=410)	
	n	%	n	%
Facilitator	2	28.57	121	29.51
Delegator	7	100	105	25.61
Personal Model	7	100	80	19.51
Formal Authority	6	85.71	58	14.15
Expert	5	71.43	46	11.22

Figure 2

The current teaching styles, number of teachers' usages and students' preferences.



On the other hand, Table 8 and Figure 2 show that the most preferred teaching style among students is the Facilitator teaching style (29.51%), but this teaching style is the lowest ranking of usage, which are 2 teachers (28.57%). Secondly, in the Delegator teaching style, students (25.61%) and all teachers (100%) use this style. Thirdly, Personal model teaching styles, which 80 students (19.51%) prefer, and all teachers (100%) use this style. Fourthly, the Formal Authority teaching style, in which 14.15% of students and six teachers (85.71%) use this style. Finally, the Expert teaching style is the lowest ranking of students preferring (11.22%), but five teachers (71.43%) use this style.

DISCUSSION AND CONCLUSION

Summary of findings

Research question one: Do students have different learning styles in EFL based on the Grasha-Riechmann Learning Style Scale?

The research revealed that the most common learning styles among Thai high school EFL students were avoidant, collaborative, and competitive, as those styles were found to have high ranks compared to others. In detail, the three highest levels of learning styles among Thai EFL students in a high school context that have been found were Avoidant (66.34%), Competitive (59.76%), and Collaborative (56.34%). In comparison, the three lowest levels of learning styles are Independent (27.56%), Dependent (15.12%), and Participant (11.22%).

Research question two: Do teachers have different teaching styles in EFL based on Grasha's Teaching Style Survey?

The finding indicated that the most common teaching styles among Thai high school EFL teachers were Personal Model, Facilitator, Delegator, and Expert, respectively. At the same time, the Formal Authority style was found to be the least preferred teaching style among EFL high school teachers. In terms of cluster domination, the most common teaching styles among Thai high school EFL teachers were Expert-Formal Authority-Personal Model-Delegator (2 persons), Expert- Formal Authority- Personal Model- Delegator (2 persons), Formal Authority-Personal Model- Delegator (1 person), Expert-Formal Authority-Personal Model-Delegator (1 person) and Formal Authority-Personal Model-Facilitator-Delegator (1 person).

Regarding the ranking of each teaching style, the three highest levels of Thai EFL teachers in high school are Delegator and Personal Models (100% using) and Formal Authority (85.71%). In contrast, the lowest level of teaching styles are Expert (71.43%) and Facilitator (28.57%).

Research question three: Is there any relationship between the teachers' and students' teaching and learning preferences?

The descriptive analysis has been used to identify (mis)matching between teaching and learning preferences among Thai EFL high school teachers and students. The result showed that the most preferred learning styles among Thai EFL teachers are Competitive (42.86% prefer, 59.76% students use), Independent (28.57% prefer, 27.56% students use), Collaborative (14.29% prefer, 56.34% students use), and Participant (14.29% preferring, 11.22% students using). While there are, no teachers prefer Dependent and Avoidant learning styles toward their students. However, 15.12% of students use a Dependent learning style, and 66.34% use the Avoidant learning style. Besides, the most preferred teaching styles among Thai EFL students are Facilitator (29.51% prefer, 28.57% teachers use), Delegator (25.61% prefer, 100% teachers use), Personal Model (19.51% prefer, 100% teachers use), Formal Authority (14.15% preferring, 85.71% teachers using) and Expert (11.22%, 71.43% teachers using).

Pedagogical Implications

The study of differences between teachers' preferred teaching styles and students' preferred learning styles has significant implications for pedagogy and the overall effectiveness of the teaching-learning process. Understanding these differences can inform educators' instructional practices and help create an inclusive and engaging learning environment. This discussion explores the pedagogical implications of this study and highlights the importance of aligning teaching styles with students' learning styles. The following implications are examples of ways educators can apply in education.

Enhancing student engagement: One of the key pedagogical implications of this study is the importance of promoting student engagement in the learning process. Teachers aware of their student's preferred learning styles can design instructional activities and strategies that cater to these preferences, thus increasing student engagement and motivation. Educators can create a more stimulating and effective learning environment by aligning teaching styles with students' learning styles. Specifically, the current study revealed that high school students in the greater Bangkok area are mostly Avoidant learners. Therefore, teachers and educators must be aware of their avoidant behaviour, such as being passive in classroom activities, either physically or emotionally. They often show signs of negative attitudes or feelings about classroom activities, such as anxiety or frustration. These attributes may lower their learning motivation and academic performance.

Differentiated assessment: The study's findings also have implications for assessment practices. Assessments should accommodate different learning styles, allowing students to demonstrate their knowledge and skills using methods that align with their preferred styles. For instance, assessments for competitive learners should aim to tap into their drive for competition, achievement, and comparison. These assessments often involve opportunities for students to showcase their skills and abilities in a competitive context. If most students in the classroom are competitive-type, teachers may consider using some activities that match their nature, including quizzes, debates, academic challenges, problem-solving challenges, or performance showcases.

CONCLUSION

To encourage Thai educators' awareness of the significance of teaching and learning preferences among Thai EFL teachers and students, the mixed-methods study emphasises the advantages of understanding teaching and learning preferences. As a result, Avoidant, Collaborative, and Competitive learning styles were shown to be more prevalent than others among Thai high school EFL students. In contrast, the three least effective learning styles are Independent, Dependent, and Participant. Personal Model, Facilitator, Delegator, and Expert were, in that order, the most popular teaching practices among Thai EFL teachers in secondary schools. However, the Formal Authority approach was the least favoured among EFL high school instructors.

There are certain (mis)matches between learners' expectations and the Facilitator's teaching style because students are prone to want their teachers to modify more activities to boost their motivation and engagement. Many teachers voiced concern about avoidant learners during the interview, saying that it could cause teachers and children to experience extreme stress or even burnout. To sum up, teachers in Thai EFL classes need to be aware of any potential misalignments between their teaching philosophies and their students' requirements and learning preferences. Teachers can improve learning environments that support student success by acknowledging and accommodating these differences. Without these crucial elements, students and teachers may become disengaged, frustrated, demotivated, and unsuccessful. Ultimately, everyone in the class has a more fulfilling and successful educational experience.

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CRITERIA ANALYSIS FOR FLOOD MANAGEMENT PLANNING BASED ON ANALYTICAL HIERARCHICAL PROCESS (AHP) AND QUADRANT MATRIX ANALYSIS (QMA) – AN EXPERT REVIEW

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ABSTRACT

This study aimed to identify key flood criteria, trade-off criteria, and a structural plan for flood management planning based on 40 criteria. The study utilised the PESTEL framework and involved ten experts from various disciplines. Two methodologies, the Analytical Hierarchical Process (AHP) and Quadrant Matrix Analysis (QMA), were used to review and score the criteria. The AHP's results indicated that the Political, Legal, and Economic domains were the main driving criteria, where P1: Fair distribution of resources (0.1917) was ranked first, followed by L1: Land ownership for flood protection (0.0739) and L4: International constitutional standards and guidelines (0.0543). The QMA's findings revealed 25 criteria as "Must-Have criteria," centred on criteria from the Environmental, Social, and Technological domains. Comparing the results demonstrated that criteria certainty affected their employment, even if highly ranked. The top ideal criteria were EC7, EC5, and L3, classified as "Very Highly Ranked" and "Must-Have". A conceptual framework was proposed, including a weather model as criteria for reflection, to aid decision-makers in making informed decisions. The study provides a significant contribution to improving comprehension and providing valuable insight into the structuring of the decision-making process in flood management planning in Malaysia and potentially in other application domains.

Keywords: AHP, criteria analysis, decision-making, flood management planning, quadrant matrix analysis.

INTRODUCTION

Floods are a cyclic phenomenon of natural disasters that pose a significant threat to social, economic, and the environment. It is one of the most destructive natural disasters that causes significant damage to infrastructure and property, impacts the stability of the economy, and even results in fatalities. From 1992 to 2022, a total of 4,578 flood disaster events have been recorded, impacting over 2.9 billion people and leading to a cumulative death toll of 210,250 (CRED, 2023). The escalation in the occurrence and magnitude of floods in recent times has prompted the necessity to formulate efficient strategies for flood management planning (FMP). The formulation of such plans necessitates the contemplation of macro-micro domain criteria.

Effective FMP is essential in lessening the impact of floods, which is contributed to by the factors and criteria used to formulate the FMPs. The criteria analysis for FMP is a

multifaceted and challenging task that requires meticulous consideration of various aspects. Relying exclusively on one perspective would obscure the overall understanding and thus impact the effectiveness of the decisions. Diverse methodologies have been employed to aid the criteria analysis for FMP, such as Analytical Hierarchy Process (AHP) and Quadrant Matrix Analysis (QMA). These tools involve the analysis of multiple criteria to make informed decisions about intricate FMP decisions.

The AHP and QMA methodologies entail subjective assessments and evaluations that necessitate expert review to ensure that the analyses and resulting decisions are sound. An expert review can help to identify potential biases or gaps in the analysis, provide guidance on the relative importance of different criteria, and ensure that the methods are being used appropriately and that the weights assigned to each criterion are reasonable and accurate. This helps to prevent errors and biases that impact the quality of the analysis and the resulting decisions.

The main goal of this study is to improve the FMP decision-making process by prioritising identified flood criteria that are driving factors in FMPs. This study holds significance as it offers valuable insights into the primary factors that are crucial for effective FMP, their respective levels of importance, and the degree of certainty associated with them. The study also helps to pinpoint plausible limitations of the AHP and QMA approaches and provides recommendations for their improvement. The objective of this study entails three main components: First, utilise the AHP technique to rank and evaluate the criteria both locally and globally. Secondly, employ QMA to map the criteria based on their degree of importance and certainty. Lastly, to propose a macro domain criteria-analysis framework for FMP.

The significance of this study lies in its structured approach to evaluating and analysing the criteria that contribute to successful and well-informed policies and strategies for FMP aimed at lessening the flood impact. This paper is organised into the following sections: Section 2 presents the background of the study, while Section 3 discusses the methodology employed. Section 4 furnishes the results and findings of the study, and Section 5 discusses the findings. Finally, Section 6 concludes the study.

BACKGROUND OF STUDY

Developing efficient FMP is crucial, considering the rising frequency and severity of floods in recent years. The impact of climate change has also caused the severity of floods to worsen. Despite various preparation, planning, and flood mitigation initiatives, present countermeasures still need to be improved. Given the significant impact of flooding in Malaysia, the complexity of FMP, and the potential benefits of using AHP and QMA methods with expert review, this study is significant for Malaysian stakeholders to improve the FMP decision process.

A study conducted by Abdullah, Siraj, and Hodgett (2021) highlights the importance of analysing various criteria for different flood measures to aid in decision-making for FMP for various Disaster Management Plan (DMP) phases based on the MCDA technique. In addition, a further investigation was conducted to examine the criteria employed in FMP based on PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) macrodomain by Abdullah et al. (2022). The study revealed that there was a notable emphasis on the Environmental domain criteria in comparison to the other domains, followed by the Social and Economic domains (Figure 1). Furthermore, the study demonstrated that a significant proportion of studies focused on singular domains, especially the Environmental domain (Table 1).

The statement underscores the significance and rationale of FMP, as its main goal is to lessen its negative effects on the economy, society, and environment. Henceforth, it is recommended that forthcoming FMP decisions consider and integrate criteria from wider domains to enhance the decision-making process.

Figure 1

Criteria Distribution based on PESTEL Macro Domain (source: Abdullah et al. (2022))

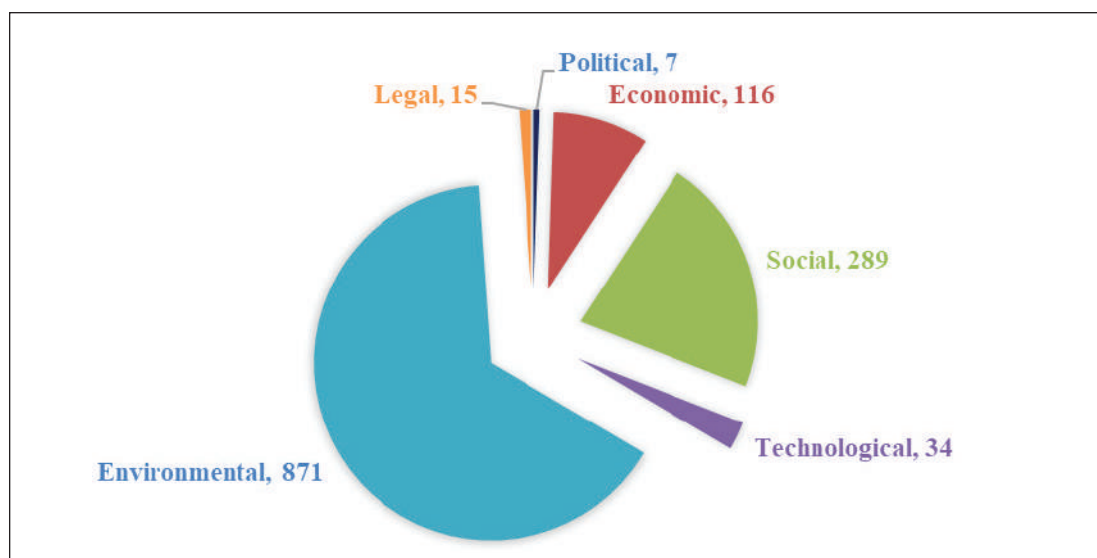


Table 1

Distribution of Macro Domain Criteria (source: Abdullah et al. (2022))

No	Macro Domain	Number of Study	No	Macro Domain	Number of Studies
1	EN	68	11	EC + S	2
2	EC + S + EN	19	12	EC + S + EN + L	1
3	S + EN	11	13	EC + T + EN	1
4	EC + S + T + EN	6	14	EC + T + L	1
5	EC + S + T + EN + L	4	15	P + EC + S + EN	1
6	P + EC + S + T + EN	3	16	P + S + EC	1
7	S	3	17	S + EN + L	1
8	S + T + EN	3	18	S + T	1
9	EC	2	19	T + EN	1
10	EC + EN	2			

P: Political, E: Economic, S: Social, T: Technological, EN: Environmental, L: Legal

Multiple studies have demonstrated a significant increase in the integration of multiple domains for FMP. Yang, Xu, Lian, Ma, and Bin (2018) employed a set of 12 criteria that spanned across economic, social, technological, and environmental domains. In a similar vein, Zahmatkesh and Karamouz (2017) assessed a total of 54 criteria that were drawn from the economic, social, technological, environmental, and legal domains. The identification, prioritisation, and ranking of criteria from multiple macrodomains were conducted prior to their application in various flood measures, where both studies focused on flood vulnerability. While this approach has demonstrated efficacy, it may only sometimes result in the formulation of all-encompassing FMP strategies that adequately tackle all macrodomains. This underscores the necessity for a more equitable approach to FMP strategies, considering the other domains are equally important.

The efficacy of a decision-making process hinges not only on the inclusion of important criteria but also on the consideration of their availability and accessibility. It is imperative to identify and rectify any ambiguity or uncertainty in the criteria to ensure the efficacy of the decision-making process. The same method employed by Iacovidou et al. (2017) to assess and evaluate criteria based on their importance and certainty is applied in this

study. The study identified two factors: the relative importance of criteria and the level of certainty of criteria. The term relative importance was used to denote how important it is for the identified criteria to be included in FMP decision-making with respect to the other identified criteria. The level of certainty of criteria was determined based on two factors: criteria that are inherently certain and criteria that are sufficient and unambiguous. These findings can be used to formulate efficient FMP strategies by considering the criteria's importance and certainty.

Recent studies about MCDA in flood disaster management included macrodomain criteria, yet their selection needed a comprehensive approach. Additionally, criteria certainty should have been discussed, potentially complicating FMP decisions. This study will analyse importance and certainty using expert judgement for criterion ranking and placement in a quadrant. The experts' involvement is important, and their evaluations can improve the accuracy and reliability of the analysis that combines AHP and QMA.

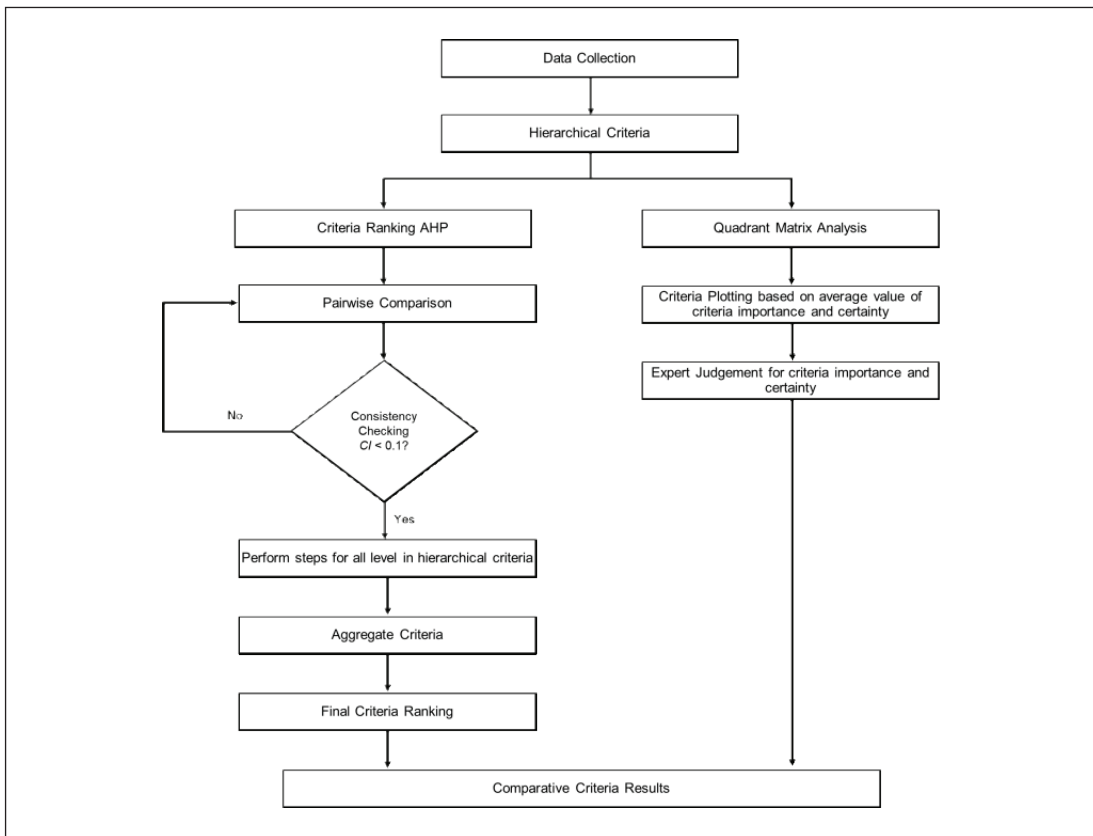
METHODOLOGY

This study involved a comprehensive assessment and scrutiny of the PESTEL macrodomain criteria that had been previously identified. This was accomplished through the expert evaluation of these criteria, which included criteria ranking, as well as an analysis of their degree of importance and certainty. An identical panel of experts was involved in both analyses. The AHP was employed to rank and prioritise the criteria, while the QMA was utilised to analyse the criteria's importance and certainty associated with them.

The concurrent application of both methodologies (illustrated in Figure 2) offers a structured and evidence-based approach to analysing criteria, enabling a comprehensive assessment of FMP criteria.

Figure 2

A Flow Diagram of the Detailed Study Process



Data Collection

This study evaluated the PESTEL criteria, drawing upon a previous study conducted by Abdullah et al. (2021) that examined the application of MCDA in the context of water-related disasters. A strategic analysis framework named PESTEL was applied as a structured approach for criteria analysis (Dockalikova & Klozikova, 2014). The framework is used to identify and analyse key macro domain criteria that can affect the FMP decisions operationally and strategically. Looking into these domains helps decision-makers grasp macro and micro criteria, facilitating them in making informed and comprehensive FMP decisions.

A comprehensive systematic literature review was undertaken, encompassing 131 research articles. The study obtained a total of 1,332 criteria through the process of extraction, which were subsequently mapped to the PESTEL framework. After careful consideration, a final set of 40 criteria was selected for this study (refer to Table 2). The steps involved in the criteria mapping are Step 1: Criteria Mapping to the PESTEL macro domain, Step 2: Eliminate duplicate criteria, Step 3: Criteria clustering, and Step 4: Criteria renaming and standardization.

Table 2

PESTEL Macro Domain Criteria

Domain	Sub-criteria
Political (P)	Fair distribution of resources (P1) and Government capacity & capability (P2)
Economics (EC)	Damage & Loss to Building (EC1), Damage & Loss in Infrastructure (EC2), Damage & Loss in Economic Activities (EC3), Investment Cost (EC4), Financial Budget (EC5), Economic Density (EC6), and Economic Loss (EC7)
Social (S)	Quality of Life & Human Needs (S1), Transportation Access(S2), Telecommunication Capacity (S3), Religious, Cultural & Heritage (S4), Personal Loss (S5), Town planning (S6), Health, Safety, Welfare & Lifestyle (S7), and Education & Awareness (S8)
Technological (T)	Flood Early Warning System (T1), Data collection and analyses (T2), Flood System/Modelling (T3), Education & Awareness (T4), Flood Structure & Control (T5), Communication (T6), and Financial Budget (T7)
Environmental (EN)	Water Quality (EN1), Land use & Planning (EN2), Hydrology (EN3), Topographic/Physical Data (EN4), Protection of wildlife habit (EN5), Protection & improvement of natural landscape (EN6), Water Supply Quantity (EN7), Flood risk management plan (EN8), Water infrastructure for Flood Protection (EN9), Damage in land use and land cover (EN10), Flood Mitigation Plan (EN11), and Biodiversity (EN12)
Legal (L)	Land ownership for flood protection (L1), Government Law & Policy Regulation (L2), Flood Disaster Institutional (L3), and International Constitutional & Standard, Guidelines (L4)

A criteria scoring session was conducted with the participation of ten experts based on a set of 40 criteria. The experts involved in the project possessed varied backgrounds in research, technical, and management domains, comprising a gender distribution of six females and four males. Their collective experience spanned a range of 10 to 20 years. The experts were tasked with assessing the criteria for both methodologies.

Analytical Hierarchical Process (AHP)

The AHP method was used to analyse the criteria ranking, where experts' opinions on the relative importance of each criterion were obtained. The AHP method helped to ensure that the prioritisation was based on objective criteria and that expert opinions were considered in a structured and transparent manner.

The AHP, which was first introduced by Saaty (1980), is a semi-quantitative methodology that utilises a hierarchical framework. This framework is comprised of various levels, including goals, criteria, potential sub-criteria, and alternatives (Saaty & Vargas, 1998). The criteria are assumed to be mutually exclusive and do not influence the alternative selections, which are

also independent of one another. The pairwise comparison was utilised within the AHP to calculate the weight of criteria for prioritisation (Triantaphyllou & Mann, 1995). The Saaty's scale (Table 3) is used to quantitatively rank the criteria, with values ranging from 1 to 0.

Table 3

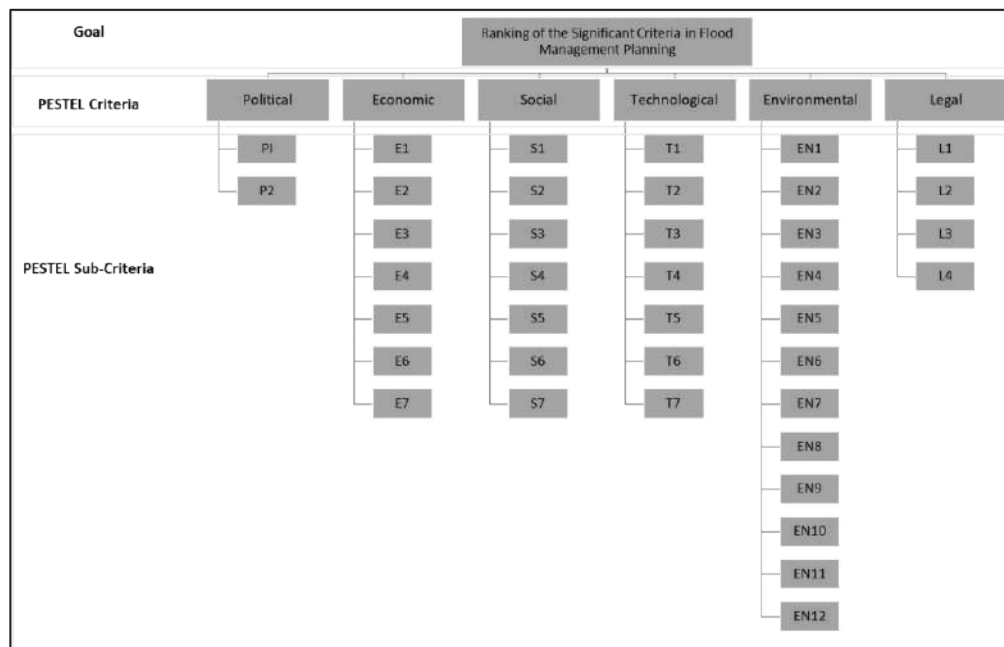
Saaty's Scale Table (Saaty, 1977)

Intensity of Importance	Definition	Intensity of Importance	Definition
1	Equal Importance	7	Very Strong Importance
3	Moderate Importance	9	Extremely Strong Importance
5	Strong Importance	2,4,6,8	Intermediate Values (for compromise between the above values)

The AHP was used in this study based on its inherent advantages, such as its structured approach to decision-making, ability to ensure consistency, and capacity to accommodate numerous criteria and sub-criteria. Furthermore, the methodology is suitable for and can be employed to evaluate both quantitative and qualitative factors (Wedley, 1990). The steps involved in AHP are as follows: Step 1: Define the decision goal and develop a criteria hierarchical structure (refer to Figure 3). Step 2: Construct pairwise comparison matrices, Step 3: Calculate the criteria weight, Step 4: Calculate consistency ratio, Step 5: Calculate overall scores.

Figure 3

Criteria Hierarchical Structure



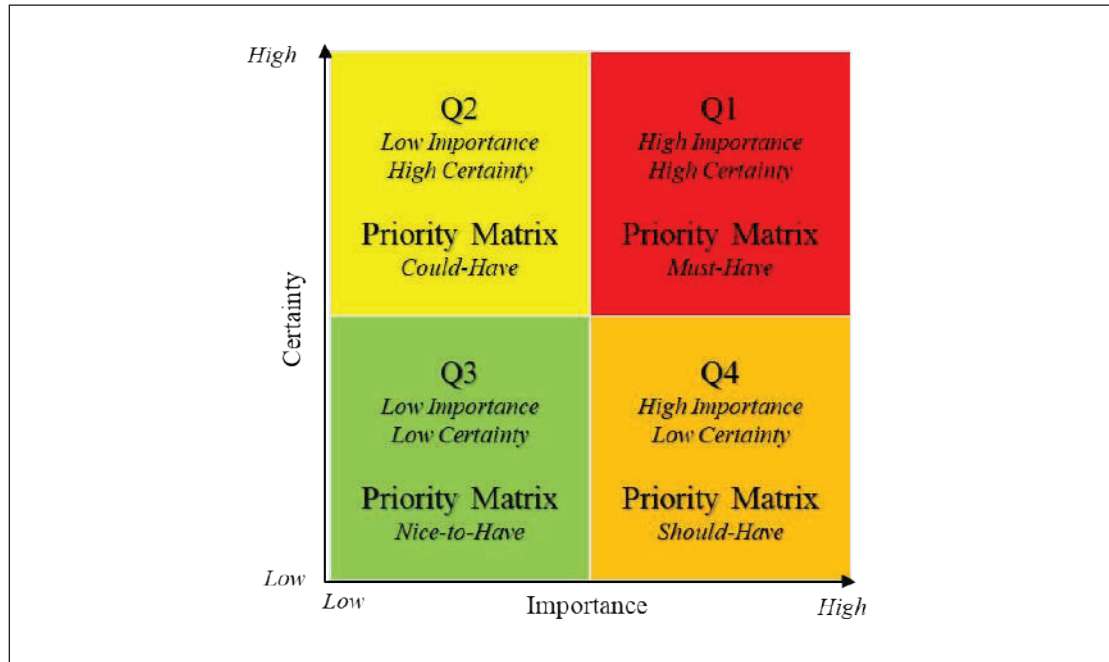
Quadrant Matrix Analysis (QMA)

A study was conducted using QMA to evaluate the relationship between the criteria's importance and the level of its certainty by using the same criteria. QMA is a tool used for strategic decision-making. It is a graphical representation of four quadrants that helps in analysing the relationship between two variables. This helped to communicate the results of the analysis more effectively to stakeholders and decision-makers, making it easier for them to understand the key issues and develop appropriate strategies. The QMA is useful for identifying areas for improvement as well as developing strategies to address them.

Using steps as suggested by Lynch, Carver Jr, and Virgo (1996), the following steps were taken: (1) define the target of interest-flood decision-maker, (2) specify interest-flood criteria, (3) determine significant and relevant criteria, (4) establish research protocol- expert rate the criteria, (5) narrowing the criteria list, (6) pre-test the list (mock-up test). Some modification was taken to make them fit this study. Figure 4 displays QMA with two dimensions: criteria importance (horizontal) and certainty (vertical) to map the criteria with its priority matrix implication. This creates four quadrants: Q1, Q2, Q3, and Q4.

Figure 4

Quadrant Matrix Dimension and Matrix Priority



RESULTS AND DISCUSSION

Table 4 shows the AHP-based consistency test results for each PESTEL macro domain (Level 2). This result indicated that experts' pairwise comparisons were consistent, ensuring their judgements were reliable for decision-making. Based on AHP, Table 5 shows the weights and rankings of PESTEL macro domains. The Political domain was the most important (weight: 0.24), followed by Legal (0.21), Economic (0.17), Social (0.15), Technological (0.11), and Environmental domains (0.11).

Table 4

Aggregate Consistency Test Result

Level	Consistency Ratio	Consistency Test
PESTEL Criteria	0.02	Accepted
Political	0.00	Accepted
Economic	0.02	Accepted
Social	0.01	Accepted
Technological	0.01	Accepted
Environmental	0.01	Accepted
Legal	0.04	Accepted

Table 5

Aggregate Criteria Weight

Domain	Weight	Ranking
Political	0.24	1
Economic	0.17	3
Social	0.15	4
Technological	0.11	5
Environmental	0.11	6
Legal	0.21	2

Experts' AHP-based judgements were aggregated and shown in Table 6. For each PESTEL macro domain, the sub-criteria (Level 3) weight and rank were calculated locally and globally. Political and Legal were the top two in global weight and rank. Notably, P1 was determined as a Very Highly Ranked Criteria (weight 0.1917), followed by L1 and L4, the top three very important sub-criteria. Interestingly, all Legal sub-criteria were deemed agreed by experts as very important, making them part of the top ten Very Highly Ranked Criteria.

Table 6

Aggregate Local and Global Weight and Ranking

Domain	Domain Weight	Domain Criteria	Local Weight	Ranking	Global Weight	Ranking	Criteria	Domain Weight	Domain Criteria	Local Weight	Ranking	Global Weight	Ranking
Political	0.24	P1	0.7950	1	0.1917	1	Environmental	0.11	EN1	0.0699	10	0.0079	38
		P2	0.2050	2	0.0494	6			EN2	0.0906	3	0.0102	31
Economic	0.17	EC1	0.1858	2	0.0318	8			EN3	0.0824	6	0.0093	34
		EC2	0.1300	4	0.0223	11			EN4	0.0856	4	0.0097	32
		EC3	0.1176	6	0.0202	15			EN5	0.0661	12	0.0075	40
		EC4	0.1150	7	0.0197	16			EN6	0.0705	8	0.0080	36
		EC5	0.1322	3	0.0227	10			EN7	0.0732	7	0.0083	35
		EC6	0.1286	5	0.0220	12			EN8	0.0701	9	0.0079	37
		EC7	0.1907	1	0.0327	7			EN9	0.0915	2	0.0103	30
Social	0.15	S1	0.1390	2	0.0208	13			EN10	0.0691	11	0.0078	39
		S2	0.1222	5	0.0183	19			EN11	0.0828	5	0.0093	33
		S3	0.1254	4	0.0188	18			EN12	0.1481	1	0.0167	21
		S4	0.1373	3	0.0206	14	L1	0.3499	1	0.0739	2		
		S5	0.0929	8	0.0139	25	Legal	0.21	L2	0.2442	4	0.0516	5
		S6	0.1162	6	0.0174	20			L3	0.2489	3	0.0526	4
		S7	0.1042	7	0.0156	23			L4	0.2573	2	0.0543	3
		S8	0.1668	1	0.0250	9							

Domain	Domain Weight	Domain Criteria	Local Weight	Ranking	Global Weight	Ranking	Criteria	Domain Weight	Domain Criteria	Local Weight	Ranking	Global Weight	Ranking
Technological	0.11	T1	0.1669	1	0.0189	17	Very Highly Ranked Criteria (Rank 1-10) Highly Ranked Criteria (Rank 11-20) Medium Ranked Criteria (Rank 21-30) Low Ranked Criteria (Rank 31-40)						
		T2	0.1419	2	0.0161	22							
		T3	0.1287	3	0.0146	24							
		T4	0.1161	4	0.0132	26							
		T5	0.0947	7	0.0107	29							
		T6	0.0978	6	0.0111	28							
		T7	0.0991	5	0.0112	27							

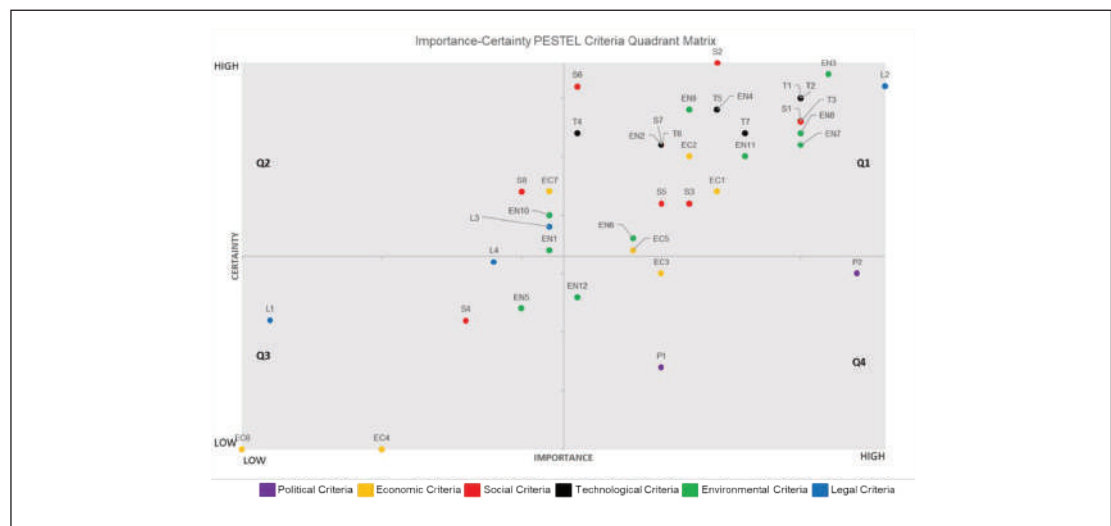
It is noteworthy to acknowledge that over 80% of the sub-criteria for Technological and Environmental were ranked as Medium and Low. Even though these, especially Environmental, are related to FMP decisions (as shown in studies by Abu El-Magd, Amer, and Embaby (2020) and Hammami et al. (2019)), experts agreed that other criteria would carry more weight in decision-making, potentially altering the decisions. This suggests that experts' experience highlights the need for additional criteria, not just from one perspective. Incorporating more criteria would provide a more thorough understanding based on cohesive criteria that are significant in FMP.

From another perspective, based on the local ranking of the sub-criteria, the results show the sub-criteria to prioritise within their domains. If these sub-criteria are not available, the next important ones can be replaced or be traded off. This helps decision-makers with criteria selection, providing options for informed choices. These findings offer valuable insights to policymakers and stakeholders, aiding them in creating an FMP that focuses on the critical criteria highlighted in this study.

Based on experts' scoring of criteria importance and certainty, average scores per sub-criteria were calculated based on QMA. Figure 5's quadrant matrix analysis showed 25 criteria in Q1 as highly important and highly certain, becoming Must-Have criteria to be considered in flood decisions. In Q1, Environmental dominated with eight criteria, followed by Social and Technology with six each. Q3 had six low-importance, low-certainty criteria deemed Nice to Have. L1, L4, EC6. S4, EC4, and EN5 were in Q3. Comparing L1 and L4 results, although AHP highly ranked both, quadrant analysis showed differences due to negotiation and compromise among experts, not considered in the QMA approach.

Figure 5

QMA for PESTEL Criteria Importance and Certainty



Q4 had four criteria, Should-Have criteria for crucial flood decisions, but with low certainty. Q4 includes P1, P2, EC3, and EN12, aligning P1 and P2's AHP rank, showing experts' consistent judgment on their importance. Meanwhile, Q2 had five criteria (L3, EC7, S8, EN1, and EN10), a Could Have criteria for consideration in the decision process.

The visual representation of criteria importance and certainty prioritisation by experts can guide the decision-making process. It helps identify areas needing improvement or performing well. Criteria for performing well should be maintained and ensure their certainty. Those needing improvement require effort, especially if certainty is an issue. Addressing it is crucial.

Considering these findings, a comparative analysis was conducted. Since AHP focuses more on objectivity from one dimension (criteria importance), QMA's two-dimensional approach (criteria importance and certainty) would supplement AHP's results. Thus, the application of more than one approach for criteria selection in decision-making might be the ideal approach. Different methods can complement and support each other, enhancing the analysis process.

Table 7 displays comparative results for criteria analysis. The ideal criteria to be employed are in the «Very Highly Ranked Criteria» and «Must-Have Criteria» groups. The reason behind this situation could be the certainty score, which affects the final distribution of the criteria. This is shown based on the certainty scores of the top three criteria ranked (P1, L1, and L4), where the certainty score was below the average certainty score. Therefore, it could be said that certainty plays a vital role in criteria selection and identification in FMP, where an assumed realistic criterion might not be selected based on its availability to be used.

Based on these approaches, decision-makers can have a more comprehensive understanding of the criteria and their relative importance for FMP. This reduces the risk of overlooking critical criteria or overemphasizing less important ones, leading to more effective and efficient FMP. In addition, the comparative results analysis helps decision-makers to identify and address any inconsistencies or contradictions in the results.

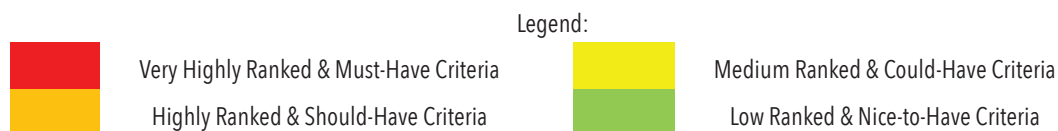
Based on the comparative analysis results, the findings can help decision-makers plan for uncertainty, which is important in flood management. The analysis shows that criteria certainty significantly affects criteria selection for FMP. Thus, resources and efforts need to be directed to prepare and manage the criteria. For instance, P1 had been identified as having a very high ranking in AHP, but in QMA, P1 is in Q4. Thus, the focus should be channelled into identifying and preparing P1 to ensure P1 moves to Q1.

As for L1 and L4, the experts ranked these criteria as Very Highly Ranked, but in QMA, it is in Q3, which is Nice-to-Have criteria. Thus, to improve the criteria's feasibility, the criteria's certainty needs to be improved, and these criteria need to be available and accessible to be used in decisions for FMP. By considering the uncertainty associated with different criteria, decision-makers can plan for different scenarios and outcomes and ensure that their plans are robust and adaptable.

Table 7

Comparative Result Analysis based on AHP and QMA

Criteria	AHP (Global)	QMA	Criteria	AHP (Local)	AHP (Global)	QMA	Criteria	AHP (Global)	QMA	Criteria	AHP (Global)	QMA
P1	1	Q4	EC2	4	11	Q1	EN12	21	Q1	EN2	31	Q2
L1	2	Q3	EC6	5	12	Q3	T2	22	Q1	EN4	32	Q4
L4	3	Q3	S1	2	13	Q1	S7	23	Q1	EN11	33	Q1
L3	4	Q1	S4	3	14	Q3	T3	24	Q1	EN3	34	Q1
L2	5	Q2	EC3	6	15	Q4	S5	25	Q1	EN7	35	Q1
P2	6	Q4	EC4	7	16	Q3	T4	26	Q1	EN6	36	Q1
EC7	7	Q1	T1	1	17	Q1	T7	27	Q1	EN8	37	Q3
EC1	8	Q2	S3	4	18	Q1	T6	28	Q1	EN1	38	Q2
S8	9	Q2	S2	5	19	Q1	T5	29	Q1	EN10	39	Q1
EC5	10	Q1	S6	6	20	Q1	EN9	30	Q1	EN5	40	Q1



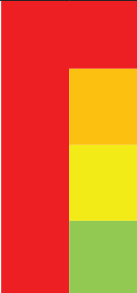















The results reveal inconsistencies in identifying ideal FMP decision-making criteria. Further analysis is required to ensure the certainty of importance criteria is factored into the decision-making process. AHP has facilitated the ranking of the ideal criteria both at the macro level and within individual domains. QMA demonstrates the significance of the interplay between the criteria' importance and certainty in criteria selection. Thus, to enhance FMP decision-making, it is imperative to meticulously construct a criteria hierarchical structure as a guide to improve the criteria selection and identification process.

Development of Proposed Criteria Hierarchical Structure

Comparing AHP and QMA results possibly identifies FMP's ideal and trade-off criteria. It also helps in structuring FMP based on criteria importance and certainty. AHP focuses on criteria importance objectively, while QMA complements it by adding certainty's two-dimensional view. This approach may be considered optimal, as it can be supplemented and reinforced by other approaches during the analysis phase.

The same colour codes assigned for both the AHP and QMA approaches were used to map the criteria to identify the ideal option. Preferably, the ideal criteria should be employed if they fall into the following groups, as shown in Table 8.

Table 8*Ideal Group of Criteria based on AHP and QMA*

Group	Paired Colour-Code	Colour-Code Explanation	Group	Paired Colour-Code	Colour-Code Explanation
1		Very Highly Ranked and Must-Have Criteria	9		Medium Ranked and Must-Have Criteria
2		Very Highly Ranked and Should-Have Criteria	10		Medium Ranked and Should-Have Criteria
3		Very Highly Ranked and Could-Have Criteria	11		Medium Ranked and Could-Have Criteria
4		Very Highly Ranked and Nice-to-Have Criteria	12		Medium Ranked and Nice-to-Have Criteria
5		Highly Ranked and Must-Have Criteria	13		Low Ranked and Must-Have Criteria
6		Highly Ranked and Should-Have Criteria	14		Low Ranked and Should-Have Criteria
7		Highly Ranked and Could-Have Criteria	15		Low Ranked and Could-Have Criteria
8		Highly Ranked and Nice-to-Have Criteria	16		Low Ranked and Nice-to-Have Criteria

Based on Table 7, the ideal criteria would be fallen into “Very Highly Ranked” and “Must-Have Criteria”. This could be due to the certainty score, which affects criteria mapping. For optimal outcomes, it is recommended to utilise L3, EC7, and EC5. This is supported by the top three highest-ranking criteria (P1, L1, and L4) certainty scores, which are lower than the average score. Hence, it can be argued that certainty holds significant impacts in choosing FMP criteria. In this context, a criteria that is deemed realistic may not be chosen solely based on its feasibility for implementation.

Different expert opinions might affect this study’s scores and outcome, as experts might favour criteria aligning with their personal preferences, convenience, or familiarity. However, these results offer a chance to investigate contributing factors and solutions. Through these methodologies, decision-makers attain a comprehensive comprehension of the criteria, avoiding overlooking crucial ones or overemphasising less important ones, thereby enhancing FMP efficiency. Moreover, comparative analysis also aids in detecting and addressing contradictions within the outcomes. If a criterion ranks high in AHP but falls in a low QMA quadrant, further investigation can clarify the reasons and implications on decision-making.

The proposed criteria hierarchy structure in Figure 6 is based on AHP and QMA results from Table 7. It is a three-tiered macro domain criteria hierarchy structure to identify important FMP to be employed.

Figure 6

Proposed Criteria Hierarchical Structure



P1, EC7, S8, T1, EN12, and L3 criteria are significant in the PESTEL macro domain. Due to their high importance and the likely use, integrating them in decision-making is recommended. The sub-criteria are listed in a manner for clear comprehension by decision-makers, helping them to see the rationale for criteria selection. This helps them review and strategise to ensure these criteria fit the “Very Highly Ranked Criteria.” and “Must-Have Criteria” categories for future decisions.

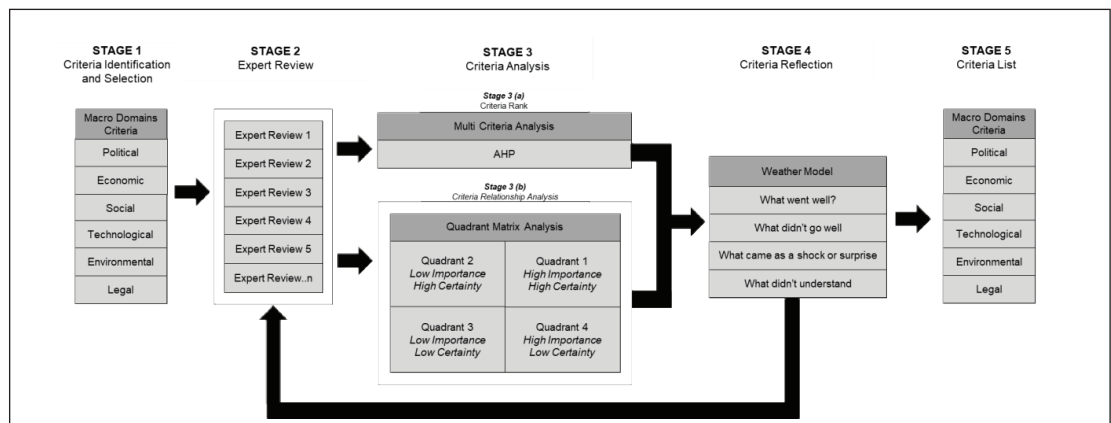
Proposed Macro Domain Criteria Analysis Framework for Flood Management Planning

The macro domain criteria analysis framework was proposed from the findings using both methodologies. Results show that the AHP ranking does not align with the QMA quadrant. This could stem from differing expert perspectives and interpretations.

The misinterpretation might result from factors like the expert’s subjective perception, personal preferences, limited data, accessibility, and underlying assumptions during the criteria analysis. Hence, the proposed conceptual framework shown in Figure 2 can improve this study’s methodology for future data collection and analysis efforts. It has five distinct stages: criteria identification and selection, expert review, criteria analysis, criteria reflection, and criteria list, depicted in Figure 7.

Figure 7

Macro Domain Criteria Analysis Framework for Flood Management Planning



In Stage 1, criteria significant for FMP are identified and selected, possibly based on experts' knowledge, experience, and prior studies. These criteria are clustered into six PESTEL macro domains. In Stage 2, the expert will assess and evaluate the criteria by scoring each criterion in two types of analysis: AHP and QMA in Stage 3. Stage 4, Criteria Reflection, is introduced to improve the process. In this stage, experts need to revisit and reassess the criteria until a consensus list is achieved in Stage 5. The criteria reflection steps, inspired by Maclean's Weather model (Maclean, 2016), were adopted, which involved four steps. Step 1: What went well? (Sunshine), Step 2: What did not go well? (Rain), Step 3: What came as a shock or surprise? (Lightening) and Step 4: What did you not understand? (Fog).

The concept of reflection, as defined by Mann, Gordon, and MacLeod (2009), is built upon works by Dewey (1933), Boud, Keogh, and Walker (1985), and Moon (1999). It critically analyses knowledge and experience to gain deeper meaning and understanding. The study incorporated various conceptualisations of reflection, including Schön (1983), Schön (1987), Boud et al. (1985), Dewey (1933), Hatton, Smith, and Education (1995), and Moon (1999). Table 9 presents the extended Weather model by Maclean (2016), which clarifies the distinctions and similarities among the steps involved.

Table 9

Models of Reflection and Reflective Practice (Source: Extended from Mann et al. (2009))

Author	Type of Model	Steps/Process
Schön (1983), Schön (1987)	Iterative Practice	Knowing-in-action, Surprise Reflection-in-action Experimentation Reflection-on-action
Boud et al. (1985)		Returning to experience Attending to feelings Re-evaluation of experience Outcome/Resolution
Dewey (1933)		Content and process reflection Premise reflection/critical reflection
Mezirow (1991)		Habitual action Thoughtful action/Understanding Reflection Critical reflection
Boud et al. (1985)		Association Integration Validation Appropriation
Hatton et al. (1995)	Vertical Practice	Description Descriptive reflection Dialogic reflection Critical reflection
(Moon, 1999)		Noticing, Making sense, Making meaning, Working with meaning, Transformative learning
Maclean (2016)		What went well in the lesson/task? What was successful? What did not go so well? What was challenging? Was there a point where you couldn't see clearly or weren't sure what to do? Was there something you saw differently during the lesson? What was it? What came as a surprise? Did anything change the course of the lesson or cause you to change what you had planned to do? Was there any conflict during the lesson? What caused it? How did you respond to it?

The Weather model was chosen from various reflection models due to its simplicity and straightforward steps, as demonstrated by Mann et al. (2009) on models of reflection and reflective practice. Stage 3 results will undergo additional analysis using Weather model steps. Step 1 acknowledges significant and certain criteria by experts will be duly recognised. In Step 2, criteria that have failed to meet expert importance and certainty will be identified and deliberated to address any issues. The third step entails identifying unexpected and startling outcomes, which may necessitate adjustments to the process. In contrast, the fourth step involves pinpointing potential conflicts that may arise, clarifying their causes, and outlining strategies to solve them.

Implication

The study makes several important contributions to FMP and other fields of study, such as:

1. The study proposes a valuable approach that combines the AHP and QMA methodologies to develop a hierarchical structure of criteria by identifying ideal criteria. The resulting structure can be used to make informed decisions regarding FMP.
2. The findings indicate that criteria certainty had a significant impact during the criteria process. High-ranked criteria importance does not help if there is uncertainty, which could harm the decision-making and results. To improve FMP, consider the criteria's appropriateness and practicality. Thus, the study suggests that the inclusion of criteria certainty should be considered during the process of selecting criteria.
3. The study emphasises how adding trade-off criteria to FMP can improve resource allocation. The comparison between AHP and QMA indicates that this methodology helps in balancing conflicting interests and priorities. Additionally, it can aid in the prioritisation of their endeavours and resources when devising flood management strategies.
4. The proposed conceptual framework could guide future research on criteria identification and selection. It assists policymakers in formulating informed decisions pertaining to structural planning and reliable data, reducing errors and uncertainties in FMP. It is also applicable in other areas like health facilities, transportation, tourism, and hospitality.

From a Malaysian perspective, it is currently understood that there needs to be more integrated AHP and QMA studies. The framework proposed could be applied in their FMP decisions to mitigate the impact and minimise the risk of flood disasters. It could improve town planning by designing residential areas, road access, hospitals, and schools in low-risk flood zones, considering macro domain criteria. In long-term use, it could save costs, enhance the quality of life of the public, and facilitate the country's growth.

CONCLUSION

In conclusion, this study highlighted the importance of a structured and rigorous approach to criteria analysis in FMP. The combined AHP and QMA methods proved valuable in identifying ideal criteria based on criteria importance and certainty. Their use effectively prioritises the criteria and comprehends their certainty, demonstrating the approach's feasibility for making informed decisions.

The proposed framework would significantly improve the FMP decision-making, where criteria will be reflected before finalisation. This can serve as a guideline to address issues and challenges, such as errors and uncertainties, for effective FMP. The study offers valuable perspectives to decision-makers, where the outcomes have the potential to enhance the advancement of FMP and regulations, thereby aiding in the reduction of adverse consequences from floods.

In summary, the results of this study have the potential to improve FMP by making them more resilient and enduring, thereby reducing the detrimental impacts of floods in social, economic, and environmental contexts. Further investigation could expand upon the findings by incorporating different experts from diverse backgrounds and adding new macro domain criteria.

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EFFECTS OF ORFF METHOD TO IMPROVE MUSIC COURSE SATISFACTION AMONG STUDENTS IN HENAN CHINA

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ABSTRACT

This study aimed to assess the effectiveness of Orff's method in improving music course satisfaction with undergraduate music students. Known for its emphasis on active participation, creative expression, and collaborative learning, the Orff Method has gained popularity in music education. However, empirical research on the effects of research findings on student music course satisfaction in undergraduate music programs is limited. This study adopts a quasi-experiment research design and will select a sample of undergraduate music students from a university in Henan Province, China, to participate in the research. The implementation of the Orff method will be incorporated into selected music courses, and the experiment group will experience the performance of the Orff method, while the control group will receive regular music instruction. Music course satisfaction surveys will be conducted to assess changes in course music course satisfaction. Data results are based on statistical analysis, including Descriptive Statistics and Paired Samples T-Test, which will be used to analyse the data and assess the impact of the Orff method on course music course satisfaction. The findings of this study provide evidence-based insights into the effectiveness of Orff's method in improving music course satisfaction in undergraduate music courses, will contribute to increasing the body of knowledge on innovative pedagogical methods of music education, and will contribute to existing knowledge about music education. This study will provide understanding to future music researchers and music teachers.

Keywords: Orff method, course music, course satisfaction, quasi-experiment

INTRODUCTION

Music education has long been recognised as integral to a student's academic and personal development (Hallam, 2010). It has many benefits, including enhanced cognitive skills, emotional health, and improved academic performance (Pitts, 2017). Music education methods and methodes play a vital role in shaping students' learning experience and overall music course satisfaction (Campbell, 2017). The choice of instructional method can significantly affect student engagement, motivation, and sense of accomplishment in music education (Asmus, 2021). In conventional music education, methodes focus on rote learning and teacher-centered instruction (López & Pozo, 2016). Students are passive recipients of information, mainly memorising and reproducing musical compositions, without much room for personal expression or creativity (Finney, 2016).

Modern methodes of music education recognise the importance of engaging students actively in the learning process (Mark & Madura, 2013; Ismail et al., 2021). These methodes encourage students to be active participants, decision-makers, and creators of music, fostering a sense of ownership and agency in the learning process and increasing music course satisfaction and motivation (Alderman, 2013). By engaging students with music in ways that resonate with them, music education becomes more meaningful and relevant, leading to greater music course satisfaction (Croom, 2015). Additionally, a method of music education that prioritises active participation and creative expression meets the changing needs of 21st-century students (Rusinek & Aróstegui, 2015). Music education methods and methodes play a vital role in shaping students' learning experience and overall music course satisfaction, by integrating these methodes

into music education, educators can meet these needs and create an environment that fosters curiosity, self-expression, and a lifelong love of music (Fink, 2013).

The Orff Method, also known as the Orff Schulwerk, was an influential method of music education developed in the mid-20th century by German composer Carl Orff and his colleague Gunild Kittmann (Shamrock, 1997). The Orff teaching method emphasises active music-making, creative expression, and the fundamental forms of music, such as rhythm, melody, and movement (Beegle & Bond, 2016). By providing opportunities for self-expression and creativity, the Orff Method develops students' self-confidence, fosters a sense of accomplishment, and ultimately increases their overall music course satisfaction with music education (Baker, 2014). The Orff Method has had a significant impact on music education around the world. It has been proven by numerous studies to improve students' course music course satisfaction and musical skills (Wei, 2023).

Although the Orff method is primarily practised in kindergarten and elementary school, there is growing interest in studying its impact on college students (Mu & Liu, 2023). The Orff method has been explored in previous studies. However, there is still a lack of empirical research on the specific effect of implementing music course satisfaction in a university environment (Guo, 2018). University is a pivotal time in a student's life, marked by new experiences, challenges, and opportunities for personal growth. A supportive and engaging environment must be created to enhance student music course satisfaction and well-being (Webber & Zhang, 2013). The potential of the Orff method to improve college students' music education experience and overall music course satisfaction makes it an interesting area of research (Jingjing & Meeson, 2022).

The main objective of this study is to determine the effect of implementing the Orff method on the music course satisfaction of college students in the context of collegiate music education. To explore the impact of implementing the Orff method on student music course satisfaction with undergraduate courses and to compare the music course satisfaction of students taught using the Orff method with those taught using conventional. The findings of this study have potential implications for music educators, curriculum designers, and university administrators. Suppose this research shows that the Orff method positively impacts college student music course satisfaction. In that case, it will provide valuable insight into the benefits of incorporating creative and engaging teaching methods. Furthermore, it may inspire the integration of the Orff method or similar methods across disciplines to improve overall student music course satisfaction and well-being. Based on these research purposes, the research hypotheses

H1: There is a statistically significant difference between pretest and posttest music course satisfaction in the control group.

H2: A statistically significant difference exists between the experimental group's pre-test and post-test music course satisfaction.

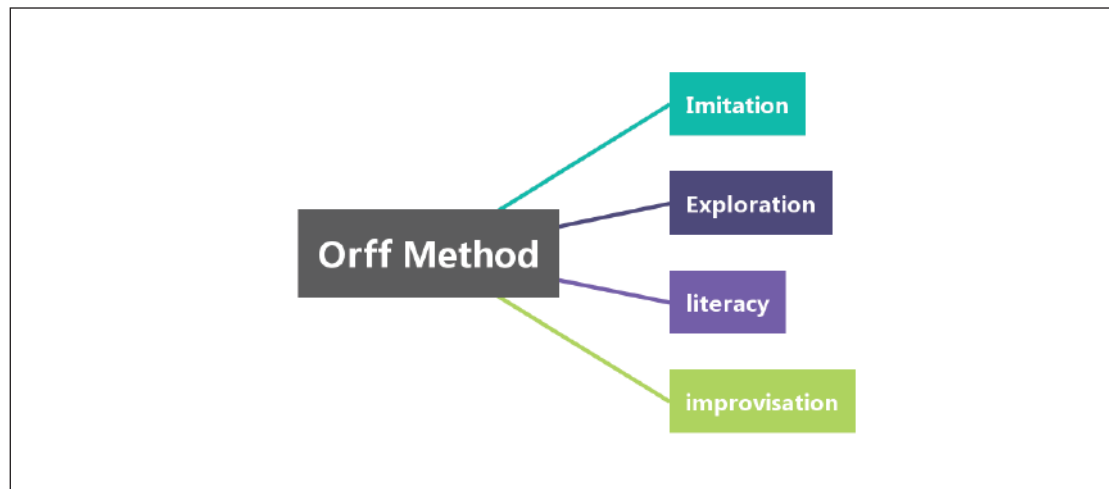
LITERATURE REVIEW

This literature review aims to explore existing research on the Orff method, college music education, and course music course satisfaction and to shed light on the effectiveness of the Orff method in improving students' overall music course satisfaction with college music courses.

The Orff method is widely recognised and practised in music education, emphasising active participation, creativity, and experiential learning (Orff & Keetman, 1950). The core ideas of the Orff method are imitation, exploration, literacy, and improvisation. To enable students to learn actively, imitation and exploration lead to improvisation and musical literacy. Voice, song, movement, and instruments are tools used to teach rhythm, melody, form, harmony and timbre (Scott, 2007). As shown in Figure 1

Figure 1

Orff Elements (Campbell, 1995)



The application of the Orff method to undergraduate music courses has brought many benefits to students. It offers a practical and engaging method of music education that goes beyond conventional theoretical instruction (Tabuena, 2021). Through active participation in music creation, students develop a deeper understanding and appreciation of the art form, and they also gain valuable performance skills and learn to work effectively in an ensemble environment, promoting teamwork (Mark & Madura, 2013). Second, the Orff method promotes creativity and improvisation by encouraging students to explore their own musical ideas and create original compositions; Orff's method develops their individuality and a sense of ownership in their music-making (Gray, 2018). This emphasis on creative expression enables students to develop their artistic voice and encourages them to think outside the box (Gray, 2018). Furthermore, the Orff method is highly inclusive and suits students of different musical backgrounds and abilities. Its experiential and kinesthetic nature enables students to engage with music regardless of their previous musical training or technical proficiency (Salmon, 2016). This inclusion promotes a positive and supportive learning environment where all students can actively participate and contribute (Monsen & Kwoka, 2014).

Existing research on the effects of music education methodes suggests that a student-centred Orff method has the potential to positively impact student music course satisfaction(Sungurtekin,2021). For example, research shows that active participation, collaboration, and creative expression in music education can increase student engagement and motivation by providing opportunities for students to learn autonomously and express themselves authentically. The Orff method may help improve college student music course satisfaction (Baker, 2014).

In a study by Van (2018), college early childhood teacher education students were surveyed to assess their perceptions of the Orff method and its impact on their improvisational skills. The results showed that students viewed Orff's method positively, with many reporting greater confidence in their ability to improvise and music course satisfaction with their musical progress. Orff's method's practical and interactive nature contributed to their music course satisfaction (Van& Excell, 2018). There are studies on the impact of Orff-based instruction on undergraduate music education majors. The findings showed that students who had experienced the Orff method reported higher levels of engagement, creativity, and enjoyment in their music lessons. They also expressed greater confidence in their musical abilities (Gooding & Yinger, 2013). Another study by Power (2013) examined the effect of the Orff method on the engagement and motivation of undergraduate music education students. The findings showed that students who experienced Orff-based instruction reported higher engagement, enjoyment, and motivation in their music lessons than conventional instructional methods (Power, 2013). A growing body of research has investigated undergraduate music education students' engagement, enjoyment, and motivation in music courses that employ the Orff method. The results showed that students

reported higher levels of engagement and enjoyment in courses that used the Orff method than in courses that used more conventional teaching methods. Students expressed music course satisfaction with the hands-on nature of the Orff activities and the opportunities for creativity and self-expression (Stewart, 2013).

METHODOLOGY

Research Design

This study conducted a quantitative study using a quasi-experimental method. The course chosen for this experiment is "Music Theory and Sight-Singing" for college students majoring in music education. The course lasts eight weeks, with 1 class per week. The participants were college students aged 18-20 studying at a university in Henan Province, China, majoring in music pedagogy. All participants voluntarily participated in this quasi-experimental study. All participants received an 8-week course instruction prior to the start of the experimental study. 82 respondents were divided into two groups in terms of gender. Specifically, 23 women (56%) were higher than 18 men (44%) in the experimental group. In the control group, there were 23 females (56%) and 18 males (44%). See Table 1 for a summary of student numbers and gender.

Table 1

Respondents' profile

Students' Gender	Research Group	N
Male	Control Group	18
	Experiment Group	18
	Total	36
Female	Control Group	23
	Experiment Group	23
	Total	46
Total	Control Group	41
	Experiment Group	41
	Total	82

According to the questionnaire statistics, the grades of students are mainly 18-20 years old, the number of students under 18 years old is 8 (10%), the number of students 18-20 years old is 68 (83%), and the number of students over 20 years old six people (7%). See Table 2 for a summary of student age.

Table 2

Respondents' age

Age	N
Under 18 years old	8
18-20 years old	68
Over 20 years old	6

According to the questionnaire statistics, 54 students (66%) are from the Urban, and 28 (34%) are from the Suburbs. See Table 3 for a summary of the student area.

Table 3

Respondents' Area

Area	N
Urban	54
Rural	28

Questionnaire design and tool development

The questionnaire consists of 21 questions and consists of two parts. Q1-Q3 are descriptive questions, statistical participants' gender, age, and suburb. Q4-Q21 is about the music course satisfaction survey of the course "Music Theory and Sight-singing". The pre-test and post-test questionnaires were the same, 82 were sent out, and 82 were returned.

Questionnaire for the music course satisfaction of "Music Theory and Sight-singing". There are 21 multiple-choice questions in this questionnaire, and there is no need to fill in the name. Participants are asked to fill in according to the actual situation. The results of this questionnaire are not disclosed, and the data collection is only for this research. Q4-Q21 are single-choice questions about music course satisfaction. Participants can choose according to their wishes, where the options are 1=Strongly dissatisfied, 2=Dissatisfied, 3=Neutral, 4=Satisfied, 5=Strongly satisfied

Research Procedure

Respondents in the control group used the conventional method for teaching, while the experimental group used the Orff method. The teaching process of these two methods is shown in Table 2. The study was conducted for eight weeks, with weeks 1 and 8 allocated to pre-test and post-test. Students were asked to fill out an online music course satisfaction questionnaire, which was anonymous, within 20 minutes. Data analysis was performed using the t-test using the Statistical Package for the Social Sciences (SPSS) version 28.

Table 4

Implementation methods of conventional method and Orff intervention research.

Week	Lesson Objective	Control Group	Experiment Group
1	Introduction to Ear Training and Pitch Recognition Pre-test	Warm-up activity: Play a series of single notes on the piano and have students identify and sing them back. 2. Introduce basic melodic intervals by playing them on the piano and having students identify and sing the intervals.	1. Warm-up activity: Vocal warm-ups using solfège syllables (do, re, mi, etc.) to practice pitch recognition and singing accuracy. Introduce basic rhythm patterns using body percussion and Orff instruments. Students play the rhythms on instruments while singing the corresponding solfège syllables. (Xylophones)
2	Interval Recognition and Melodic Dictation	1. Review melodic intervals and practice interval recognition using piano and audio examples. 2. Introduce melodic dictation activities. Play short melodic phrases on the piano, and students notate them using staff notation or solfège syllables.	1. Review solfège syllables and practice pitch recognition using vocal warm-ups. 2. Introduce melodic patterns using Orff instruments. Students play the patterns on instruments while singing the corresponding solfège syllables. (Alto Glockenspiel)

Week	Lesson Objective	Control Group	Experiment Group
3	Rhythmic Ear Training	Focus on rhythmic ear training. Play rhythmic patterns on the piano or audio clips, and have students clap or notate them using rhythmic notation. 2. Incorporate rhythm and pitch by playing short melodic patterns with rhythmic variations, and students identify and notate them.	1. Conduct ear training exercises to recognize melodic intervals and patterns. 2. Introduce melodic dictation activities. Play short melodic phrases on the Orff instruments, and students notate them using solfege syllables.
4	Chord Recognition and Progressions	Introduce chord recognition using audio examples. Play chords and have students identify their quality (major, minor, etc.) and root position. 2. Explore common chord progressions using piano or audio examples. Have students listen and identify the chords used in the progressions.	1. Explore basic harmony concepts using Orff instruments. Introduce chords and their relationship to the solfege syllables. 2. Play chord progressions on instruments while singing the corresponding solfege syllables.
5	Sight Singing and Melodic Memory	Practice sight singing exercises using piano or audio examples. Students sing short melodies played on the piano or provided through audio. 2. Work on melodic memory by playing short melodies and having students sing them back or notate them.	1. Encourage improvisation using the Orff instruments. Provide students with simple chord progressions or rhythmic patterns to improvise melodies using solfege syllables. 2. Collaborative improvisation: Students form small groups and take turns creating short improvisations while others provide accompaniment.
6	Harmonic Ear Training	Focus on harmonic ear training using piano or audio examples. Play chords or progressions and have students identify their quality and root notes. 2. Incorporate harmonic dictation activities. Play chord progressions on the piano or audio clips, and students notate them using chord symbols or staff notation.	1. Introduce a selected piece of music that demonstrates different melodic and rhythmic patterns. 2. Play the music on Orff instruments while students listen attentively. Discuss and analyze the elements of the piece, including identifying solfege syllables and rhythmic patterns.
7	Listening and Analysis	Introduce a selected piece of music that showcases various elements like melody, harmony, and rhythm. 2. Play the piece on the piano or provide audio recordings, and have students actively listen and analyze the musical elements present.	1. Divide students into small groups and assign different melodic patterns or rhythms using Orff instruments. 2. Rehearse and practice ensemble playing, focusing on dynamics, coordination, and listening to each other. Present a short performance where each group performs their assigned parts together.
8	Culminating Project and Review Post-test	1. Assign students to create short musical compositions using the concepts learned throughout the course. 2. Provide time for practice and rehearsals. Students perform their compositions for the class, explaining the musical elements and concepts they incorporated.	1. Allow students to create their own composition using solfege syllables and Orff instruments. Provide time for group rehearsals and individual practice. 2. Students perform their compositions for the class, showcasing their understanding of solfege, rhythm, harmony, and creativity.

RESULTS AND DISCUSSION

This study selected the music course satisfaction questions of Perceived interaction (PI) Bailey (2002) and music course satisfaction (SA) Cheng and Chau (2016) and combines the author's "Music Theory and Sight-Singing Course music course Satisfaction Questionnaire" designed for students. This study tested the reliability of the scale before using it, and the obtained Cronbach's α coefficient is 0.915, which is a high reliability coefficient (Sekaran and Bougie, 2010). Analyze valid data. An exploratory factorial analysis was performed for the model's measured sizes. Factorizability of data was assessed with Kaiser-Meyer-

Olkin (KMO) and Bartlett tests. A KMO value of $0.839 > 0.6$ and a $KMO > 0.80$ indicate an adequate sample size. Pass Bartlett's sphericity test $p = 0.00 < 0.05$, indicating that it is suitable for factor analysis. The above analysis shows that the research data has a good level of structural validity, which comprehensively shows that the scale has good reliability and validity. Therefore, the "Music Theory and Sight-singing Course music course satisfaction Questionnaire" used by this research institute is feasible to measure college students' music course satisfaction.

Table 5

Reliability test

Reliability Statistics	
Cronbach's Alpha	N of Items
.915	18

Table 6

Validity test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.839
Bartlett's Test of Sphericity	Approx. Chi-Square	440.332
	df	153
	Sig.	<.001

Paired t-test: A paired t-test was used to compare the mean scores on pre- and post-session music course satisfaction surveys for the same group of participants. This test determines whether there is a statistically significant difference in course music course satisfaction before and after implementing the Orff method. A paired t-test is appropriate when the data are normally distributed and the dependent variable is measured continuously.

H1: There is a statistically significant difference between pre-test and post-test music course satisfaction in the control group.

According to Table 7, the paired test was used to compare the course music course satisfaction of the control group before and after the test. Table 7 shows no significant difference in course music course satisfaction before and after the test in the control group ($t = -0.632$, $sig = 0.536$, $p > 0.05$). This shows that one hypothesis (H1) was rejected.

Table 7

Paired statistics sample for the control group.

Dependent variable	Mean	N	Correlation	Tscore	df	Sig. (2-tailed)
Pretest	2.31	18	0.983	-0.632	17	0.536
Post-test	2.32	18				

H2: A statistically significant difference exists between the experimental group's pre-test and post-test music course satisfaction.

Paired t-tests were used to compare the course music course satisfaction of the experimental group before and after the test. Table 8 shows a significant difference in course music course satisfaction ($t = 1.381$, $sig < .001$, $p < 0.05$) of the experimental group before and after the test. This shows that one hypothesis (H2) failed to be rejected.

Table 8

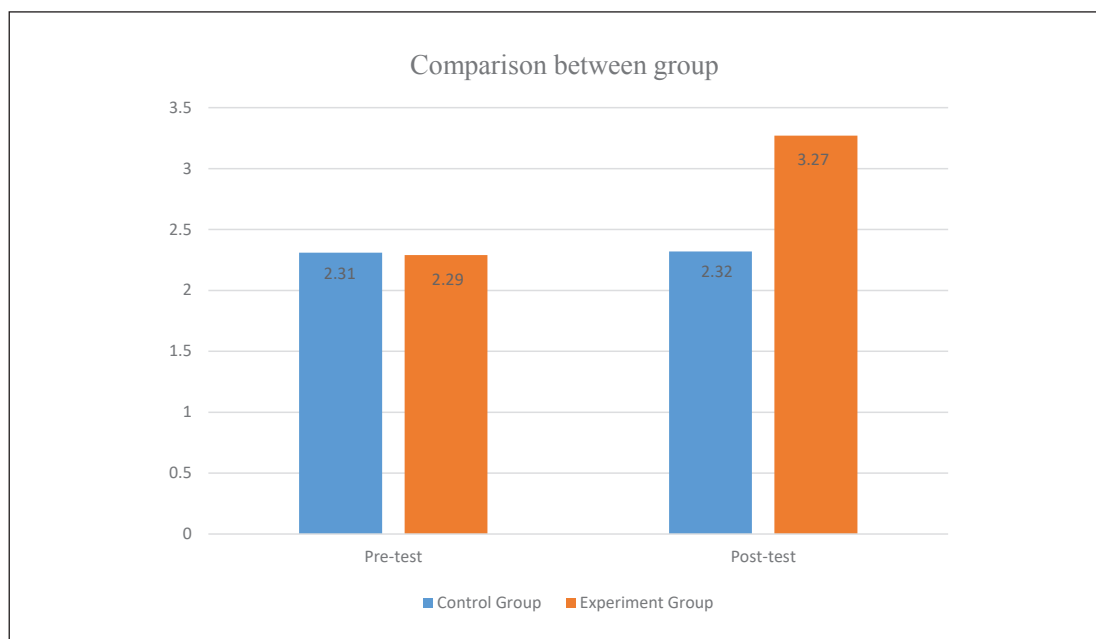
Paired statistics sample for experiment group.

Dependent variable	Mean	N	Correlation	T score	df	Sig. (2-tailed)
Pretest	2.29	18	0.479	10.381	17	<.001
Post-test	1.87	18				

According to the data results, it is found that the course music course satisfaction of the students in the experimental group has improved. Finally, we provide the course music course satisfaction between the two groups via Figure 2 below.

Figure 2

Comparison between groups for music course satisfaction.



The effectiveness of the Orff method has been proven in the test. The course music course satisfaction of the students in the experimental group has been greatly improved. The post-test data shows that the music course satisfaction of the experimental group is significantly higher than that of the control group. The increase in course music course satisfaction can be attributed to several key factors related to Orff's method. First, the Orff Method's active and experiential learning method allows students to actively engage with music through hands-on activities such as playing an instrument, singing, and moving. This active participation fostered a sense of ownership and agency in their learning, contributing to greater satisfaction with the music course (Duan, 2013). In contrast, students who took conventional methods did not experience a surge in achievement. Studies have shown that students who learn using the Orff method are more engaged and enjoy Orff activities more than students who learn in the conventional group (Meng, 2023). Furthermore, the Orff method's emphasis on creative expression is crucial in improving course music course satisfaction. By encouraging students to improvise, compose, and arrange music, the Orff Method allows students to express their unique musical ideas and develop their artistic voice. This freedom of expression and creative exploration can lead to a more fulfilling and satisfying learning experience (Okeyo et al., 2022). The collaborative nature of the Orff method also contributes to greater course music course satisfaction. The method usually involves small group activities and ensembles, promoting student cooperation and teamwork. Collaborative learning experiences create a positive classroom environment that fosters a sense of belonging and camaraderie. Supportive social interactions and shared musical experiences can increase student music course satisfaction with a course (Wilson, 2022).

The findings of this study are consistent with previous research on the impact of student-centered and experiential learning methods in music education. Research consistently shows that methods that prioritize active participation, creativity, and collaboration increase student engagement, motivation, and music course satisfaction. The Orff method effectively incorporates these elements with its holistic student-centered music education, resulting in increased music education and increased music course satisfaction (Locke, 2016). The researchers also found that an advantage of the Orff method is that the instruction does not only rely on the teacher. The students can learn by pairing or group activities, thus acting as their tutors, turning the conventional classroom into a flipped classroom (KOCABAŞ, 2016). Students can observe their fellow students' improvisations, compare them with their own, and interact with each other. By applying the Orff method to the university's music education curriculum, we believe that students will have enormous scope and opportunity to enhance their music course satisfaction further, thereby gaining insight into musical concepts by linking the elements of space, time, and energy. better understanding.

In addition, the reports of the instructors in the experimental group showed that not only did the students' music course satisfaction with the classroom increase, but the instructors also believed that they had more motivation to teach in the classroom. This is an important finding. The student-centered, experiential method of the Orff Method enables students to explore music holistically and meaningfully. By providing opportunities for creativity, self-expression, and collaborative work, the Orff Method creates a joyful and engaging learning experience. This positive emotional connection to the curriculum can profoundly affect overall student music course satisfaction and positively impact teacher music course satisfaction. Feeling fulfilled, enjoyed, and fulfilled can increase their music course satisfaction with the learning process and the course.

The results of this quasi-experimental study suggest that an Orff method intervention positively affects course music course satisfaction of university students in music education. Active experiential learning methods, a focus on creative expression, and an emphasis on collaboration contribute to greater student music course satisfaction. By implementing the Orff method in music education programs, educators can increase student motivation, engagement, and overall music course satisfaction. The Orff method focuses on active participation, creativity, and collaboration, in line with best practices in music education, to create a dynamic and fulfilling learning environment. Incorporating the Orff Method increases student music course satisfaction and contributes to their musical development, creativity, and personal growth. These findings support integrating the Orff method into music education programs to create engaging, student-centred learning environments that increase college students' overall music course satisfaction in their music courses.

CONCLUSION

The study concluded that the implementation of the Orff method in university music education courses had a positive impact on course music course satisfaction among undergraduates. The empirical study showed that students who received the Orff method intervention reported higher levels of music course satisfaction than those who received conventional instruction or no intervention. The researchers observed that the students who participated in the Orff method reported higher levels of music course satisfaction compared to the control group. These studies highlight the ability of the Orff method to increase students' motivation, engagement, enjoyment, and overall perception of the learning experience. These findings have important implications for music educators and institutions. Integrating the Orff method into a college music education program can lead students to a more fulfilling and satisfying learning experience. Educators can create a dynamic, student-centred learning environment that increases course music course satisfaction and fosters student musical development and growth by providing active participation, creativity, and collaboration opportunities. By embracing the principles of active participation, creativity, and collaboration, educators can create an environment that fosters student engagement, fosters a positive classroom climate, and ultimately increases

course music course satisfaction. However, it is essential to acknowledge the limitations of the current study. The number of studies specifically examining the effect of the Orff method on course music course satisfaction among undergraduates is limited, and further research is needed to strengthen the evidence base. Future studies should consider diverse student populations, long-term follow-up, and more rigorous study designs to ensure the validity and generalizability of the findings.

Implementing the Orff method in college music education courses positively impacts students' music course satisfaction. The Orff Method's focus on active participation, creativity, and collaboration aligns with a student-centred teaching method and enhances student motivation and engagement. Findings underscore the importance of incorporating student-centered, experiential learning methods into higher education music programs to improve college student music course satisfaction, enjoyment, and overall success.

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Appendix

"Music Theory and Sight-singing" Course music course satisfaction Questionnaire

Q1: Your gender:

A: Male B: Female

Q2: Your age group:

A: Under 18 years old B:18-20 years old C: Over 20 years old

Q3: Are you from the city or the suburbs?

A: Urban B: Suburbs

Q4. How satisfied are you with the teaching content of the course?

Q5. Your music course satisfaction with the teaching progress of this course

Q6. Your music course satisfaction with the teacher's choice of music sample tracks in this course

Q7. Your music course satisfaction with the teaching atmosphere of this course

Q8. Your music course satisfaction with the sense of participation in this course

Q9. Your music course satisfaction with the classroom order during this course

Q10. How satisfied are you with the teacher-student interaction in this course.

Q11. How satisfied are you with the student-to-student interaction in this course.

Q12. Your music course satisfaction with the music teachers in this course

Q13. Your music course satisfaction with the teacher's explanation of music knowledge in this course

Q14. Your music course satisfaction with the teaching ability demonstrated by the teachers in this course.

Q15. Your music course satisfaction with the ability of teachers to use teaching equipment, PPT and software in this course.

Q16. How satisfied are you with your learning attitude in this course?

Q17. Your music course satisfaction with the mastery of your music knowledge after learning this course.

Q18. Your music course satisfaction with the teaching materials and auxiliary teaching materials used in this course.

Q19. Your music course satisfaction with the assessment format in this course

Q20. Your music course satisfaction with the course work of this semester

Q21. How satisfied are you with the overall situation of the teaching curriculum of "Music Theory and Sight-singing"?

A STUDY OF RURAL RESIDENTS' TRUST AND READINESS TOWARD DIGITAL TOURISM IN MALAYSIA THROUGH TOURISM WEBSITE

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ABSTRACT

Digital technology has changed the tourism sector, and online travel agencies are now more crucial than ever for consumers to plan and reserve their vacations. However, due to reliability and security concerns when using websites, rural customers could be hesitant to employ this technology. This technology hesitation is a significant issue since rural areas can contribute to the growth of the tourism industry in the future. This study seeks to fill this knowledge gap by determining the characteristics of trust that are appropriate for this group while also assessing the level of trust that rural residents have in tourism websites. By using Linear Regression Analysis of 380 respondents in rural areas, the study found that security and information quality affect the trust among rural residents. Meanwhile, web design is not affecting their trust in tourism websites. However, trust was found to be a relevant mediation for security and rural residents' readiness. As a result, this study can offer creators of tourism websites insights to increase the trust and willingness of rural residents, encouraging tourism among rural residents and bridging the digital divide between urban and rural areas.

Keywords: Digital tourism, rural residents, trust, tourism website, readiness.

INTRODUCTION

The world tourism industry sector is increasingly inclined to practice digital technology and online platforms in their business operations. This situation makes digital technology an essential tool for potential tourists to plan and book their tours. However, despite the capabilities and advantages possessed by digital technology, rural residents may not be inclined to use this platform due to the trust factor and security issues when they use the website (Isabirye et al., 2015). This matter needs to be given attention by all parties because rural residents have the potential to drive economic development for the future of the tourism industry (Yang et al., 2021).

Some studies show that trust is the main factor in influencing the behaviour of website users to use digital technology (Qalati et al., 2021; Manzoor et al., 2020). This is considered appropriate for tourism websites, where trust is the most important factor in increasing the confidence of potential tourists and encouraging their participation in the digital platform to make their purchases (Palacios et al., 2021). However, there still needs to be more research on the factors that affect rural residents' trust and readiness to participate in digital tourism through websites.

Further research needs to be conducted to identify the detailed factors that influence their trust and readiness. Additionally, a study is needed to fulfil the need for more research on rural residents' trust in tourism websites and their readiness for digital tourism. There is a probability of such factors as the level of digital literacy among rural residents, where residents who are less familiar with technology will tend to use something other than digital tourism platforms (Samsuddin et al., 2021). Furthermore, to overcome trust issues, tourism websites can provide clear and transparent information about privacy policies and security guarantees to their website users.

This study was conducted to identify the level of trust and readiness of rural residents towards digital tourism through the tourism website and thus has addressed the gaps in the previous studies. This study will provide insight to industry players and tourism website developers regarding trust factors among rural residents and, at the same time, identify their level of readiness for digital tourism in Malaysia. In addition, this study will help tourism industry players promote domestic tourism and bridge the digital gap between urban and rural residents. This is also in line with the Malaysian government's plans to develop digital tourism based on the Malaysia Tourism Policy 2020-2030 (MOTAC, n.d). All these changes took place after the pandemic hit Malaysia in 2020, when travel restrictions were in place. This makes the tourism sector start practising digital technology in their operations for the continuity of operations.

In conclusion, this study has the potential to make a significant impact on the tourism industry by promoting tourism in rural areas and bridging the digital divide between urban and rural areas. By identifying the dimensions of trust that are acceptable for rural residents, this study can provide insights for tourism website developers to boost the trust and readiness of rural inhabitants, thereby promoting economic growth and development in rural areas.

METHODOLOGY

Research Paradigm

This study is in the form of causal research because it is seen as appropriate to explain the design of the study conducted. As defined by Kumar, Talib, and Ramayah (2013), causal research is a type of study where the researcher looks at the cause-and-effect connections between the studied variables. Specifically, this study was conducted on a cross-sectional basis because the data for this study was only collected once (Sekaran & Bougie, 2016). The convenient sampling method was used for this study, and the individual is the unit of analysis. Convenient sampling, according to Kumar et al. (2013), consists of selecting any group of respondents that is convenient for the researcher to gather data. Therefore, the data for this study that has been collected is as many as 400 respondents from Penang, Kedah, Melaka, and Perak. All respondents were selected based on their location in the village or rural areas. All in all, the data collection process took 20 days, and an average of 20 questionnaires were distributed each day (Ittig, 2000).

Data Analysis

Statistical Package for the Social Sciences (SPSS) Version 25 was used for this study to analyse all the data obtained from the questionnaire that can be used. From 400 questionnaires collected, only 380 articles can be used for this study. The first analysis that has been carried out is frequency analysis, which is used to analyse the demographic data of the respondents. Next, the reliability of the instruments was also tested and determined using Cronbach's Coefficient of Alpha. Mahmud (2008) noted that the reliability of measurement demonstrates the stability and consistency with which the instrument measures the notion. Finally, the causal relationships among variables in accordance with the proposed hypotheses of the study were analysed using linear regression analysis. According to Kumar et al. (2013), linear regression is a study of the impact of an independent variable on the dependent variable. Then, when the mediating variable is incorporated into the direct link between the variables, mediation analysis also takes place through the study of the after-effect (strength of Beta coefficient and significance level).

LITERATURE REVIEW

Digital Tourism in Malaysia

Malaysia has taken significant steps to address the challenges and promote the development of its tourism sector by embracing digital tourism through the National Tourism Policy 2020-2030 (Tourism Malaysia, n.d.). However, the adoption of digital tourism by rural communities remains to be determined.

In an effort to introduce digital tourism, Malaysia has invested heavily and launched various initiatives to facilitate the adoption of digital tourism, such as an e-visa program and developed a few mobile applications to provide tourists with information about local attractions (Malaysia Department of Immigration, 2022; Samsudin et al., 2022). This initiative is expected to be a catalyst and initiation to the practice of digital tourism in Malaysia, in line with the government's goals in the National Tourism Policy (Tourism Malaysia, n.d.).

Nevertheless, digital tourism acceptance among rural residents needs to be given attention. There are previous studies conducted abroad saying that limited access to digital technology and internet connectivity in rural areas affects their acceptance of technology (Dominques & Rivera, 2020; Davies, 2021). The study revealed factors that need to be taken seriously in Malaysia to make the government's inspiration a success.

Enhancing digital infrastructure in rural regions is crucial to realising this objective. This entails enhancing internet accessibility, granting access to reliable and inexpensive digital equipment, and providing digital literacy programs specifically designed to meet the needs of rural people. Additionally, targeted marketing and awareness campaigns can be employed to educate and engage rural residents about the benefits and opportunities of digital tourism.

Furthermore, partnerships between government, private and local stakeholders are needed to ensure the effective implementation of digital tourism in rural areas. This could include partnerships with telecom companies to expand connectivity and partnerships with local businesses to promote digital tourism services.

In conclusion, while Malaysia has made significant progress in promoting digital tourism, the acceptance and adoption of this approach by rural communities are challenging due to limited access to digital technology and internet connectivity. Addressing these barriers through infrastructure development, education, and collaboration will be crucial in fostering the acceptance and utilisation of digital tourism in rural areas, thereby contributing to the overall growth and development of Malaysia's tourism sector.

Tourism Website

Tourism websites are a very important platform for promoting tourist attractions and attracting more visitors. The use of websites in the marketing and promotion of tourism has become an important component in management, especially in the management of tourist destinations, especially in today's digital world (Putra et al., 2018; Akbar et al., 2022). Tourism websites also have the potential to help rural residents by giving them exposure to the uniqueness of tourist attractions and helping them interact with digital tourism technology (Lopes et al., 2019).

Tourism websites are now growing with the existence of several new interactive elements, such as virtual tours and social network integration (Voronkova, 2018; Medhekar, 2017). Such websites will help improve user experience as well as increase their satisfaction for them to make them real tourists (Huang & Mou, 2021).

Although there is much potential for tourism websites for rural communities, the acceptance of digital technology in rural areas can be difficult due to the lack of digital literacy and the digital divide (Samsuddin et al., 2021). As a result, it is very important to build a tourism

website that has user-friendly features and is accessible, where it will encourage the use and willingness of rural residents.

Security On Tourism Website

The travel industry has undergone a rapid transformation as a result of digital tourism, with more and more customers turning to online resources for their travel planning, booking, and research (Li et al., 2018). However, due to worries about website security, particularly with regard to online payment and personal data protection, rural residents may be reluctant to adopt these digital technologies (Gretzel et al., 2015). This review of the literature looks at how web security tools can increase rural residents' trust in travel websites and increase their willingness to participate in digital tourism. Consumers' financial security and trust in using digital platforms are directly impacted by online payment security, making it a critical component in fostering consumer trust (Kim et al., 2008) for rural citizens who might be less accustomed to online.

Hence, adding reputable third-party payment processors like PayPal or Stripe can raise rural residents' trust in travel websites (Luo et al., 2010). These gateways add more security layers to online transactions, protecting users' financial data and lowering the risk of fraud (Dwivedi et al., 2017). Besides, trust in travel websites also requires protecting users' personal information (Belanger et al., 2002). Consumers' willingness to interact with digital platforms can be significantly impacted by worries about personal data privacy, according to research (Malhotra et al., 2004). Adopting digital tourism technologies can be difficult for people living in rural areas, but ensuring strong personal data protection measures can help. It is crucial to communicate privacy policies in plain language and to establish trust among rural residents (Pollach, 2005). The privacy policies on tourism websites should be readily available and transparent and explain how users' data is gathered, used, and safeguarded (Culnan & Armstrong, 1999). According to studies, having clear and thorough privacy policies can increase users' trust and propensity to disclose personal information on digital platforms (Xu et al., 2008).

This literature review highlights the significance of web security tools, particularly online payment security and personal data protection, in order to increase the trust of rural residents and their willingness to engage in digital tourism. By utilising encryption technologies, reliable payment gateways, open privacy policies, and adherence to data protection regulations, tourism websites can create a secure and trustworthy environment that encourages rural residents to use digital tourism platforms.

H1: Tourism website security features affect user trust.

H1(a): Online payment security functions on tourism websites affect user trust.

H1(b): Personal data protection on tourism websites affects user trust.

Web Design Instruments

The increase and advancement of digital tourism has revolutionised the operation of the tourism industry by increasing the dependence of potential customers on online platforms for them to research, plan and then book their travel packages (Toubes et al., 2021). This happens because product tourism can be considered intangible, and potential tourists find it easier to identify the quality level of a tourism product if they obtain relevant information first (Abu Bakar, 2016). However, rural residents still need help catching up with the progress of digital technology, which has the potential to restrict their ability to take full advantage of it for this industry (Freeman & Park, 2015).

There is no doubt that ease of use can be used as a critical factor in identifying customers' level of trust in websites (Samed al-Adwan, 2019). The easier a website that the users can use, the higher the level of dependence and trust in the platform (Suhardi & Taufik, 2018). For the situation of rural residents who need to become more familiar with digital technology, a user-friendly interface is very important to increase trust and convince them to interact with the digital tourism platform (Sadiq & Adil, 2020). In order to optimise

ease of use, web designers need to build a website that can be accessed easily and can be adapted to the screen size of a mobile device since it has become a trend nowadays (Majid et al., 2015). A previous study found that a mobile-responsive website will increase user satisfaction and, at the same time, increase their trust (Amin et al., 2014). For rural residents who depend on the use of mobile devices to get internet access in their place, a mobile-responsive tourism website can make them ready to interact with digital tourism (Cai et al., 2020).

Effective online navigation also significantly raises the trustworthiness of travel websites, in addition to making them simple to use (Liang & Lai, 2002). One study found that user-friendly navigation can boost both customer trust and engagement with the digital platform (Zhang et al., 2014). Therefore, simple website navigation will probably lower barriers for rural populations using digital tourism technology. Additionally, when a user is browsing a website, breadcrumbs, a kind of navigational aid, can boost user confidence (Broughton & Zahedi, 2017). The breadcrumb feature and browsing history can aid users in navigating the platform. In light of this, using breadcrumbs on tourism websites benefits rural residents by reducing their cognitive load. Therefore, for the situation of rural residents, the use of breadcrumbs in tourism websites lowers the cognitive load and also helps them browse the website more effectively, increasing their trust in the platform (Palmer, 2002). H2: Tourism web design affects rural residents's trust.

H2(a): Ease of use in tourism websites affects rural resident's trust.

H2(b): Tourism website navigation affects rural residents' trust.

Information Quality on Tourism Websites

In recent years, consumers have increasingly chosen to plan, research, and book their travel experiences online. However, due to doubts about the accuracy of the information available online, rural residents might be reluctant to interact with digital tourism platforms.

Due to its direct influence on consumer expectations and decision-making processes, price information is considered an important component of information quality in tourism websites (Chang et al., 2010; Hu et al., 2020). Therefore, in order to increase rural residents' trust in using tourism websites, price information needs to be clear and reliable.

Furthermore, quality price information can be improved through the implementation of dynamic pricing strategies, such as personalised or location-based pricing (Cebollada et al., 2019). This strategy can increase the transparency and fairness of prices and, at the same time, can increase trust in the tourism platform (Canalejo et al., 2018).

In addition, online reviews, which are a function that provides thoughtful suggestions and insights to potential tourists, are also considered an important aspect of delivering quality information on tourism websites (Thomas et al., 2019; Marine-Roig et al., 2020). The confidence level of rural residents can be increased through their trust and dependence on online reviews (Kim & Kim, 2020).

Building trust among rural residents depends on making sure that online reviews are reliable and authentic. Travel websites should implement strong review management strategies, such as verification procedures or moderation policies, to maintain the confidence and dependability of reviews (Chan et al., 2017).

In order to build trust among rural residents and increase their willingness to use digital tourism platforms, this review of the literature emphasises the value of information quality instruments, particularly price information and online reviews. Tourism websites can foster a trustworthy and dependable atmosphere that motivates rural residents to use digital tourism platforms by offering transparent and accurate price information, putting in place price comparison tools and dynamic pricing strategies, and ensuring the credibility and authenticity of online reviews.

- H3: Information Quality in Tourism Websites Affects Rural Resident's Trust.
 H3(a): Price Information on Tourism Websites Affects Rural Resident's Trust.
 H3(b): Online Review on Tourism Websites Affects Rural Resident's Trust.

Rural Residents' Trust Affects Digital Tourism Readiness.

The level of rural residents' trust in tourism websites can affect their readiness for digital tourism (Kim et al., 2011; Palacios et al., 2021). This happens when rural residents feel confident and trust the information and services provided on the website, at the same time making them inclined to accept digital tourism experiences (Liao & Shi, 2017).

Trust also can be built through the transparency, accuracy of information, and the level of responsiveness of a website. Hence, website operators need to communicate openly with the community immediately to address any concerns or issues that arise through the website.

In addition, a user-friendly interface with personalised recommendations can also build trust and increase user engagement with the website (Otebolaku & Lee, 2018). However, if rural communities do not trust a website or they feel that their needs for the platform are not met, they are likely to hesitate to accept and prepare for digital tourism (Palacios et al., 2021; Kim & Kim, 2020). Therefore, industry players need to ensure that their websites can build trust with rural communities to promote readiness toward digital tourism.

The provision of transparent and accurate information can also build the trust of rural communities and can provide many benefits to tourism (Liao & Shi, 2017). This includes displaying online reviews or providing live interview sessions with customers at tourist locations. This function is also important to address any concerns that may arise among rural residents towards digital tourism. Therefore, by prioritising the involvement of rural communities and building their trust, website builders can foster readiness towards digital tourism among rural residents while providing many benefits to the national economy.

- H4: Trust towards the tourism website affects rural residents' readiness for digital tourism.
 H4a: Trust towards tourism website security affects rural residents' readiness for digital tourism.
 H4b: Trust towards tourism website web design affects rural residents' readiness for digital tourism.
 H4c: Trust towards tourism website information quality affects rural residents' readiness for digital tourism.

Trust Mediates the Tourism Website Features and Rural Residents' Readiness

Website characteristics such as security, web design and quality of information on rural residents' willingness to participate in digital tourism mediate by their trust in tourism websites. This happens in line with the development of digital technology in the evolution of tourism. Most tourists now rely on digital resources to manage their tours due to the growth of online booking platforms in the market. However, rural residents may not be ready for this digital change in tourism as a whole. Therefore, tourism websites are required to play an important role in promoting digital tourism. Hence, tourism websites can help rural residents feel more comfortable when using digital technology in tourism (Liao & Shi, 2017).

In a previous study, user trust can be increased through security features such as safe payment methods (Barkhordari et al., 2017). In fact, security features, web design and information quality can also help users feel more comfortable with the process (Tam et al., 2022). Therefore, tourism websites play an important role in encouraging rural people to use technology for tourism purposes to increase their engagement.

Besides, websites that provide secure payment methods can help increase users' trust in the website and subsequently feel confident in making transactions online. In addition, a

tourism website that is user-friendly and easy to navigate can also help users do the online booking process easily (Huang & Mou, 2021). In fact, providing high-quality information about tourist attractions may help rural residents make decisions about their visit plans (Chen et al., 2019).

All of these factors combine to help bridge the digital divide between urban and rural communities in terms of tourism while creating rapid economic development and cultural exchange.

H5: Rural residents' trust mediates the effect of tourism website features and their readiness towards digital tourism.

H5a: Rural residents' trust mediates the effect of tourism website security features and their readiness towards digital tourism.

H5b: Rural residents' trust mediates the effect of tourism website secure online payment features and their readiness towards digital tourism.

H5c: Rural residents' trust mediates the effect of tourism website personal data protection features and their readiness towards digital tourism.

H5d: Rural residents' trust mediates the effect of tourism web design and their readiness towards digital tourism.

H5e: Rural residents' trust mediates the effect of tourism website ease of use and their readiness towards digital tourism.

H5f: Rural residents' trust mediates the effect of tourism website navigation features and their readiness toward digital tourism.

H5g: Rural residents' trust mediates the effect of tourism website information quality and their readiness towards digital tourism.

H5h: Rural residents' trust mediates the effect of price information quality on tourism websites and their readiness for digital tourism.

H5i: Rural residents' trust mediates the effect of tourism website online review features and their readiness towards digital tourism.

RESULTS AND DISCUSSION

Analysis of Data

Moving further with the process of research, SPSS Version 25 was used to analyse collected data from sample respondents. The first frequency analysis was conducted, which involved analysing the demographic profiles of respondents included in the study. After that, reliability analysis was carried out to measure the internal consistency of each item, depicting variables existing in the study (Tavakol & Dennick, 2011). Next, the relationship within variables was tested according to the proposed hypotheses by using the multiple linear regression analysis. As asserted by Rogers, Cromwell and Newton (2005), regression analysis is used to determine the association between criterion variables and dependent variables.

Demographic Profiles Analysis

A total set of 400 questionnaires were disseminated during data collection, and at the end of the process, 380 questionnaires with complete answers were returned by the respondents. Gender-wise, the majority of respondents were female, which contributed to 58.4% (n=222) out of the total respondents, leaving males with 41.6% (n=158). In terms of age, those who are in the age group of 50 and above contributed the most in responding to the questionnaires, 32.1% (n=122) of them, followed by those who are in the age group of 20-29 years old, which were 29.5% (n=112), 40-49 years old with 20% (n=76) and 30-39 years old with 18.4% (n=70) out of total respondents. Apart from that, those who are married topped the number of respondents by 68.9% (n=262), while there were only 31.1% (n=118) of those who are singles. Another profile that depicts the level of education among respondents shows that the majority of them hold at least a bachelor's degree 52.9% (n=201), followed by those who have STPM, Matriculation and Diploma with

35.3% (n=134), have Master's Degree/Doctorate with 9.2% (n=35) and have SPM with only 2.6% (n=10). As for the profile of occupation, most of the respondents were government sector workers at 42.4% (n=161), followed by private sector workers at 23.2% (n=88), others with 18.4% (n=70) where most of them were pensioners followed by housewives, students with 11.6% (n=44) and running own business with 4.5% (n=17). Table 1 below shows the information on the demographic profiles of respondents in the study.

Table 1

Demographic Profile of Participant

Items		N	Percentage
Gender	Male	158	158
	Female	222	222
Age	20-29 Years Old	112	29.5
	30-39 Years Old	70	18.4
	40-49 Years Old	76	20.0
	50 Years Old	122	32.1
Marital Status	Married	262	68.9
	Single	118	31.1
Education	SPM	10	2.6
	STPM, Matriculation, Diploma	134	35.3
	Bachelor's Degree	201	52.9
	Master's Degree/Doctorate	35	9.2
Occupation	Government Sector Worker	161	42.4
	Private Sector Worker	88	23.2
	Owning Business	17	4.5
	Students	44	11.6
	Others (Housewife, Jobless, etc.)	70	18.4

Reliability Analysis

According to Tavakol and Dennick (2011), reliability analysis is used to determine sets of items in the sense of ensuring their internal consistency because each item might have the possibility of redundancy—hence the analysis. According to Nunnally (1978), the minimum acceptable value for Cronbach's Coefficient of Alpha, portraying the reliability of items, is 0.70. After the analysis was carried out, it was found that all constructs representing the Tourism Website Security, Tourism Web Design, Information Quality, Trust and Rural Residents' Readiness yielded the value of Cronbach's Coefficient of Alpha between 0.77 and 0.94. These results show that all constructs possessed a higher value of consistency, which is depicted in Table 2 below, with indicators of consistency following George and Mallery (2003).

Table 2

Reliability Test

Variables	Cronbach's Alpha	Internal Consistency
Tourism Website Security	0.77	Acceptable
Tourism Web Design	0.90	Excellent
Information Quality	0.90	Excellent
Trust	0.94	Excellent
Readiness	0.79	Acceptable

Regression Analysis

Next, multiple linear regression was conducted to test each of the variables affecting one another, proving all the proposed hypotheses. According to Sekaran and Bougie (2016), an analysis of regression is utilised when the predictor variable is expected to influence the dependent variable. Based on the analysis, it is shown that Tourism Website Security, Tourism Web Design and Information Quality explained 47.5% ($R^2=0.475$) of the variance in rural residents' trust toward tourism websites. In answering the first hypothesis (H1), which tourism website security features affect user trust, it is found that tourism security features contribute to a significant effect on residents' trust with a positive value of $\beta=0.369$, $p<0.000$, portraying the strong positive effect of security features on residents' trust toward tourism website. Therefore, Hypothesis 1 is supported.

It is moving on to the second hypothesis (H2), which proposes that tourism web design affects rural residents' trust. The result of the analysis shows that Tourism Web Design yielded an insignificant value of $\beta=-0.112$, $p=0.209$. This denotes that there is no significant effect of tourism website design on rural residents' trust in tourism websites. Following the notion, Hypothesis 2 (H2) is rejected.

The next hypothesis suggested that the information quality provided on tourism websites affects rural residents' trust. The result yielded a significant positive strength value of tourism website information quality at $\beta=0.477$, $p<0.000$ on rural residents' trust. Therefore, hypothesis 3 (H3) is accepted.

The last hypothesis, which taps into the effect of trust towards tourism websites on rural residents' readiness for digital tourism, shows that trust towards tourism websites explains 69.7% ($R^2=0.475$) of the variance in rural residents' readiness for digital tourism. The regression coefficient shows a positive significant value at $\beta=-0.835$, $p<0.000$. This indicates that trust towards tourism websites has a significant positive value on rural residents' readiness for digital tourism. Therefore, hypothesis 4 (H4) is accepted. Table 3 depicts the results of the proposed hypotheses in the study.

Table 3

Regression Analysis

Criterion Variable	Predictors	Multiple Linear Regression			
		R^2	Unstandardized β	Standardized β	Significance
Trust	Tourism Website Security		0.455	0.369	0.000
	Tourism Website Design	0.475	-0.138	-0.112	0.209
	Tourism Website Information Quality		0.579	0.477	0.000
Rural Residents' Readiness	Trust	0.697	0.877	0.835	0.000

Mediation Analysis

Mediation analysis was run to test the mediating effect of trust on the relationship between tourism website features and rural residents' readiness for digital tourism. The mediation test was conducted following the traditional Baron and Kenny (1986) method, which aspects that have to be met are firstly, the predictors must have a significant effect on the criterion variables. Next, the predictors must have a significant association with the proposed mediating variable. After that, the criterion variable must be regressed on both predictors and mediating variables, where it is also important to ensure that the

mediating variable has a significant effect on the criterion variable. Lastly, the regression coefficient for the predictor must be reduced than the regression coefficient yielded in the first aspect.

Following the procedures, it was found that the direct effect of tourism website security features on rural residents' readiness was initially significant with a regression coefficient of $\beta=0.251$, $p<0.000$. However, after trust was introduced to the relationship, its strength was highly reduced to $\beta=-0.010$, $p=0.820$, suggesting a full mediation. Next, tourism website information quality was initially high in terms of its strength on rural residents' readiness with the value of $\beta=0.483$, $p<0.000$. However, when trust entered the relationship, the regression coefficient was reduced to $\beta=0.146$, $p<0.05$. Since the relationship is still significant, it can be concluded that there is a partial mediation of trust in the relationship between tourism website information quality and rural residents' readiness. For the aspect of tourism website design, it failed the first condition set by Baron and Kenny (1986), where the initial direct significant effect of tourism website design on rural residents' readiness was not successfully proven. Therefore, it was not suitable to continue the mediation analysis. Lastly, the condition of the third aspect set by Baron and Kenny (1986) was also met, where the mediating variable of trust significantly affects the criterion variable of rural residents' readiness ($\beta=0.707$, $p<0.000$). Table 4 displays the results of the mediation analysis conducted.

Table 4

Mediation Analysis

Relationship	β (Without Trust)	Significance (Without Trust)
Tourism Website Security → Rural Residents' Trust	-0.010 (0.251)	0.820 (0.000)
Tourism Website Information Quality → Rural Residents Trust	0.146 (0.483)	0.022 (0.000)

CONCLUSION

The study used SPSS version 25 to analyse the data collected from the sample of respondents. The survey revealed that the majority of respondents were female, married, and had at least a bachelor's degree. Reliability analyses were conducted to measure the internal consistency of each item by identifying existing variables in the study. Studies have shown that all construction is highly valued for its sustainability. Then, multiple linear regression analysis was used to examine the relationships among the variables according to the proposed hypothesis. The study found that visitors' website security features have a significant positive effect on residents' trust in visitors' websites, while visitors' website design has no significant effect on residents' trust. In addition, the study found that the quality of tourist website information has a significant positive effect on rural residents' trust, and trust in tourist websites has a significant positive effect on rural readiness for digital tourism. Mediation analyses showed that trust fully mediated the relationship between visitor website safety features and rural digital tourism readiness. In contrast, trust partially mediated the relationship between visitor web information quality and rural readiness for digital tourism networks.

It can be concluded that rural residents are ready to be involved in digital tourism based on tourism websites, provided that they trust the websites. This study provides valuable insights into the factors affecting rural residents' trust in tourism websites and their readiness for digital tourism. Tourism website designers and marketers can use the findings of the study to improve website quality and rural internal confidence. This study also highlights the importance of website security features and high-quality information in creating trust among rural residents. In addition, this study shows that trust among rural residents affects their readiness for digital tourism. Overall, this study contributes to the study of new literature on trust and readiness towards digital tourism and, at the same time, serves as a reference for future studies.

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ADULT COVID-19 VACCINATION BEHAVIOR IN MALAYSIA: ARE WE SATISFIED

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ABSTRACT

Objectives: This study aims to provide a preliminary grasp on individuals' expectations towards, and satisfaction with, the COVID-19 vaccination based on the Health Belief Model and Expectation Disconfirmation Theory. Through the dissemination of e-questionnaires, 180 samples were obtained. Through multigroup analysis (MGA), partial least squares structural equation modelling was employed to assess the research hypothesis and provide a preliminary grasp of later booster intention. The findings suggest that perceived severity and self-efficacy positively influence satisfaction through expectation, the most important self-cultivated initiative in self-health. In addition, the MGA found no significant differences in the respondents' intentions, with the majority intending to obtain a booster vaccine. Given the limited number of studies on the public's satisfaction with the COVID-19 vaccine, the current study's findings are expected to give academics, practitioners, and policymakers more contextualised social and community health economic consequences. The vaccination recipients' comfort with the subject matter will be critical in achieving herd immunisation and creating resilient communities. The current study contributes to the existing literature by giving a multimodal experience viewpoint on COVID-19 vaccination.

Keywords: Vaccination; COVID-19; satisfaction; expectation; Health Belief Model; Expectation Disconfirmation Theory

INTRODUCTION

COVID-19 is an infectious disease caused by the novel coronavirus, which transmits through the droplets generated by infected persons. Briefly, the virus – primarily affecting the respiratory tract – was first reported in Wuhan City, Hubei Province, China, as early as December 2019. Subsequently, it spread like wildfire across Asia and other parts of the world. As a result, on January 30th 2020, the Director-General of the World Health Organisation (WHO) declared the COVID-19 outbreak of international concern as a public health emergency (WHO, 2020).

Malaysia reported its first COVID-19 case on January 25, 2020, involving three Chinese tourists from China who entered Johor, Malaysia, from Singapore, marking Malaysia's first wave of the COVID-19 pandemic (Umar et al., 2021). The first wave was brief and mild, involving only 22 cases. Then, a religious gathering held in Kuala Lumpur at the end of February 2020 caused the second wave; a sudden surge in cases to three digits was reported. In response, the Malaysian government announced a Movement Control Order (MCO) in March 2020 to reduce social mixing, curbing confirmed cases. The MCO was implemented in different forms (e.g., conditional MCO, enhanced MCO and recovery MCO) throughout 2020 and 2021 nationwide. It ended in October 2021 following the Government's intention to treat COVID-19 as an endemic disease whereby one is expected to live with the COVID-19 virus henceforth (Reuters, 2022). For the record, Malaysia was reporting new cases in four

digits during this point in time. However, despite urging the nation to treat COVID-19 as endemic, Malaysia began to record a steady increase in the number of new cases starting from February 2022, where a weekly average of 24 222 cases was reported on 20 March 2022 (Centre for System Science & Engineering, 2022).

Vaccines effectively develop a solid and lasting immune reaction, which is necessary to fight against infectious diseases (Mahmud et al., 2021). Expectedly, many countries rely on vaccines to curb the further spread of the COVID-19 virus (Sharma et al., 2021; Alwi et al., 2021). WHO has recognised the important role of vaccines in combating the outbreak and thus began its collaboration with pharmaceutical industries to produce vaccines as early as October 2020. As a result, WHO has approved six vaccines (i.e., AstraZeneca, Johnson & Johnson, Moderna, Pfizer, Sinopharm, and Sinovac), which have met the required vaccine safety and efficacy criteria as of June 3rd 2021 (World Health Organization, 2021). Though these approved vaccines are not 100 per cent protective, they are seen to provide a high degree of protection for humans.

WHO insisted that curbing the pandemic is not solely on the effective vaccine but the population's vaccination. This claim has led to an intense discussion on the importance of having herd immunity. Herd immunity refers to resistance to the spread of an infectious disease within a population based on the immunity of a high proportion of individuals due to mass vaccination. According to Wirawan et al. (2021), statistics on the previous influenza pandemic demonstrate that vaccination of 80 to 90 per cent of the population establishes herd immunity.

In response to the perceived importance of vaccination and herd immunity, the Malaysian government established a special committee in February 2021 (MOSTI, 2020). Through the National COVID-19 Immunisation Programme (NCIP), this committee is responsible for ensuring an immediate, safe, and effective vaccine for all people in Malaysia to curb the further spread of the virus in the country. In addition, the committee has pledged to ensure that at least 80 per cent of the adult population in Malaysia be vaccinated by February 2022 to achieve herd immunity. Nevertheless, the recent statistics in *Our World in Data* (Our World in Data, 2022) highlight that Malaysia is yet to reach the desirable immunity where only 78.68 per cent of the population in Malaysia had completed their initial two doses of vaccine as of March 20, 2022.

A global survey conducted in July 2020 involving 13 thousand respondents from 19 countries revealed that the average acceptance rate of the COVID-19 pandemic is 71.5%; the acceptance rate essentially differs across countries (Wirawan et al., 2021). In addition, the systematic literature review by Sallam (2021) observed a drop in the vaccine acceptance rate among citizens of five countries who had participated in multiple surveys related to the COVID-19 pandemic over 12 months. The decline is measured between the acceptance rate computed from the initial and last survey they participated in in 2020. The drop in the acceptance rate can be explained by the apparent hesitancy of the participants towards the vaccine uptake, where their initial positive response may have changed by the time the vaccine rolled out (Wirawan et al., 2021; Wong et al., 2021). Malaysia is one of the countries that changed the vaccine acceptance rate over time. For example, while the survey conducted in December 2020 involving 1411 Malaysian adults showed an acceptance rate of 83.3 per cent (Alwi et al., 2021), the survey conducted among nine low-and-middle-income countries, including Malaysia, from December 2020 to February 2021 observed a significant drop in the willingness of Malaysian adult's vaccine uptake which ranges from 55.4 per cent to 78.6 per cent (Bono et al., 2021).

Many researchers have examined widespread reactions to the COVID-19 epidemic, as evident in the systematic literature review by Sallam (2021) in December 2020 based on articles published in a single database. The initial results had 178 further refined articles with more specific search terms relating to the COVID-19 vaccine acceptance or hesitancy. Sallam completed the review with 30 articles that met the exact inclusion criteria. Based on the literature review, it is wise to conclude that investigation into the COVID-19 pandemic relating to public behaviour is indeed on the rise.

Existing studies, published in various databases, are focus on the pre and current behaviour of the public towards the vaccine, precisely the vaccine acceptance [e.g., Mahmud et al., 2021; Sharma et al., 2021; Alwi et al., 2021; Wirawan et al., 2021; Wong et al., 2021; Bono, 2021). However, to the best of our knowledge, there is no study investigating the post-vaccine behaviour of the public at the time of drafting this manuscript. Therefore, the current study intends to fill the gap by focusing on satisfaction with vaccine uptake, a crucial measurement of post-vaccine behaviour.

Satisfaction in the context of healthcare services implies the state of pleasure or happiness that the public experiences while using a health service. Therefore, it is claimed to be one of the key standards to assess the healthcare services' overall success (Manzooft et al., 2019). Applying this notion to the COVID-19 vaccine behaviour, only those satisfied with the vaccine uptake will be instrumental in assisting the government in achieving the desirable herd immunity.

Recent studies show that protection against COVID-19 may decrease within three to six months of being fully vaccinated, particularly against the more potent, like the Delta variant (Singh et al., 2021). Therefore, a booster dose has been deemed the solution to increasing immunisation and protection against the COVID-19 virus. Countries that had begun their immunisation program earlier have started administering booster doses to their citizens. Malaysia officially joined the national vaccine booster program (NVBP) on October 13th 2021. The uptake of vaccine boosters in Malaysia is voluntary (Harun, 2021) and only offered to the medical and security front liners and individuals aged above 60 years old and with preexisting illnesses (Singh et al., 2021; Harun, 2021). Given the early development of NVBP, this study intends to explore the intention of booster uptake in Malaysia.

LITERATURE REVIEW

Theoretical background

This study proposed an integrative research framework (Figure 1) based on the Health Belief Model (HBM) (Rosenstock, 1974) and Expectancy Disconfirmation Theory (EDT) (Oliver, 1996).

According to HBM, people who are aware of the underlying health risk take action to prevent illness (perceived susceptibility refers to an individual's belief in the likelihood of contracting diseases and an individual's assessment of the efficacy of various interventions aimed at reducing the risk of sickness or curing an illness, known as the perceived benefits), which has serious consequences (perceived severity refers to an individual's belief in the negative impact on physical or emotional well-being when contraindicated and perceived barriers reflecting the beliefs about the hurdles disturbing the action of performing health behaviour). As a proactive safety roadmap for COVID-19 prevention, HBM provides a good ground for further interventions in many contexts, especially health-related behaviour research such as community pharmacists' communication with patients (Sheppard & Thomas, 2021) and weight management (McArthur et al., 2018). The HBM postulates people's health preventive behaviour by predicting whether people will take early detection of health risks, prevent, or control to respond to the intensifying transformation of self-care and its impact on community health (Sheppard & Thomas, 2021). According to Jose et al. (2021), different magnitudes yielded by the belief, attitude, and behaviour components influence the outcomes.

EDT posits its capabilities to address people's satisfaction through the expectation's fulfilment mechanism, notably enhancing the continuance behaviour (Wang et al., 2021). Expectations are future-oriented predictions about a product's or service's performance, with the mechanics of "better than or worse than expectation" upon the experience of the actual product or service (Spreng, 2003). This mechanism continues to be an essential input in reflecting the truth-conclusive behaviour reaction. Positive disconfirmation was defined as product or service performance exceeding expectations. In contrast, negative

disconfirmation was defined as performance falling short of expectations. Confirmation occurs when the expectation and performance are equal.

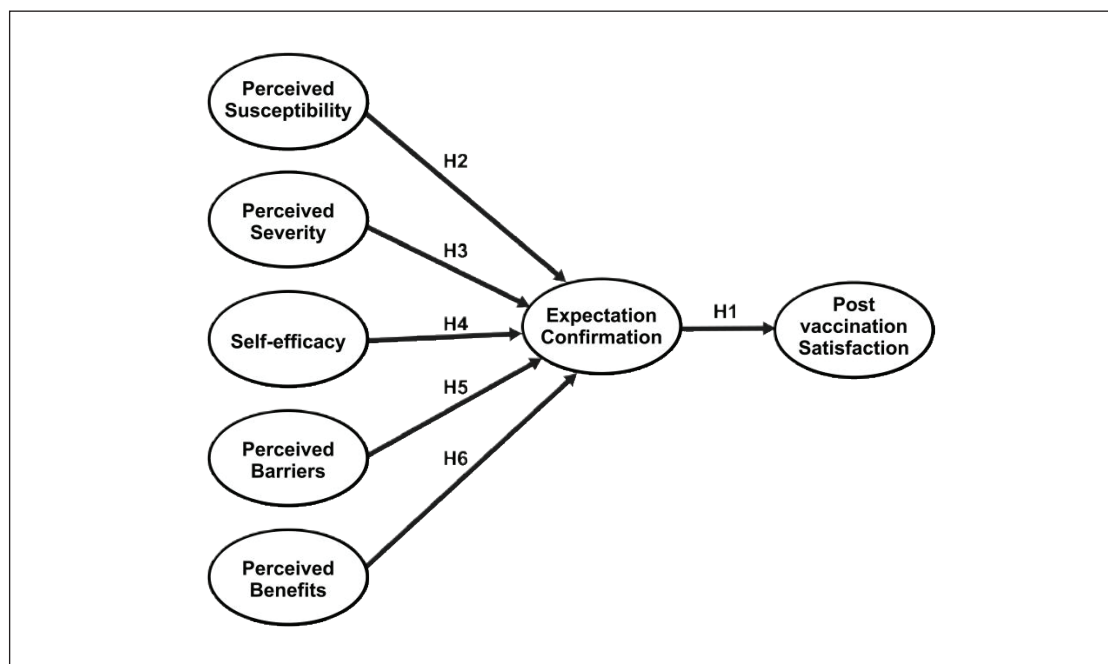
Previously, EDT was used in a variety of contexts, including food service (Yi & La, 2004), the treatment effect on patient satisfaction (Hudak et al., 2003), and product assortment satisfaction (Hudak et al., 2003; Diehl & Poynor, 2010). EDT can shed light on the COVID-19 post-vaccination satisfaction. Thus, it is critical to recognise that vaccine recipients' satisfaction can be an effective preventive measure in the current long-term scenarios. There is no data to determine the number of immunisations required to eradicate COVID-19 infection, implying that it could be a long-term approach if vaccine recipients' satisfaction is achieved. Furthermore, the healthcare profession is pressing the management to realise that vaccine recipient satisfaction is the backbone of preventing an avalanche of vaccine opposition (Kirksey et al., 2021).

To sum up, HBM is an expectancy-value-based model that postulates that health decision-making remains rational (Bam & Kim, 2020). It relies on the competence-related belief (e.g., perform attitude A to get B awarded). EDT principles are the assessment mechanism for understanding vaccine recipients' satisfaction. The collective expectations of people play a crucial function in the present theoretical model proposition, further speeding the belief in fulfilment through the expectation disconfirmation theory proportion. In this situation, the post-vaccination experience approximates the expectations, and the receiver is in balance. Conversely, disconfirmation happens if expectations are not realised; the recipients' evaluation is that the post-vaccination stimulation has negative consequences. According to Serrano et al. (2018), satisfaction is achieved simply by meeting expectations.

Figure 1 illustrates the study's framework and research hypotheses. It comprises five constructs examining the factors influencing an individual's vaccine expectation and satisfaction. The constructs are: i) perceived susceptibility, ii) perceived severity, iii) perceived barriers, iv) perceived benefits, and v) self-efficacy.

Figure 1

Research framework



Hypotheses Development

The following section discusses the past studies with the five constructs on the relationship between vaccine expectations and vaccine satisfaction. A discussion of the proposed hypothesis for this study follows.

Vaccine Satisfaction

In this study, the authors employed the Expectation Disconfirmation Theory (EDT) model as the research framework for defining vaccine satisfaction. The EDT model is well established in healthcare literature in various contexts, such as dependent, mediator, or moderator variables (Hudak et al., 2003; Serrano et al., 2018). The satisfaction level indicates that consumers will most likely return after a satisfactory experience. Similarly, if the public perceives the vaccination as effective in combating the COVID-19 virus, they will develop a favourable intention to accept the vaccination.

Consumer satisfaction has been conceptualised as vaccine satisfaction in the existing literature (Hudak et al., 2003; Serrano et al., 2018). Typically, vaccine satisfaction is defined as the fulfilment of one wishes, expectations, or needs or the gratification derived from being vaccinated. This evaluates the vaccination's performance, providing a pleasurable level of consumption-related fulfilment, including levels of under- or over-fulfilment (Kilic et al., 2021). Individuals will evaluate the pre and post-vaccination while comparing the expectations. The individuals are satisfied if the expectation is met with a positive intention. If that expectation is met negatively, the individuals are dissatisfied. According to the satisfaction literature, if customers enter a contract with a service provider and their expectations are exceeded positively, they are known to be satisfied with the service (Hudak et al., 2003; Kube et al., 2018). This implies the pleasurable feeling of fulfilment. Hence, an individual can be satisfied to return to normalcy, as in removing an aversive state (Oliver, 2010). However, the customer is dissatisfied if the perceived service exceeds expectations. Similarly, when the individual perceives that the vaccine intake meets or exceeds their performance expectation, they are satisfied. Nonetheless, if the vaccine fails to perform as the individual expected, they will be dissatisfied.

Vaccine Expectation

EDT model posited that individuals with expectations tend to gain more knowledge about that particular behaviour than those without expectations (Wang et al., 2021; Serrano et al., 2018). It indicated that expectation is essential in motivating satisfaction. Expectations are forward-looking beliefs concerning the service encounter and reflect an individual's perception of the vaccine before receiving it. Therefore, expectations can be influenced by prior perceived beliefs and personal attributes.

The positive relationship between expectations and satisfaction is explained through an assimilation effect. According to EDT, when an individual forms an initial expectation before making a specific transaction, it is what the individual believes they should and will receive through the transaction. After a certain period, individuals will form perceptions about the performance. They assess the perceived performance with their original expectation and determine how it is confirmed. Subsequently, they form a satisfaction level based on their confirmation and expectations. When individuals observe that their post-vaccination experience performs closely to their expectations, they tend to embrace their post-vaccine experience towards their baseline expectations and rely heavily on this expectation to form vaccine satisfaction.

In this study, vaccination expectation is defined as one's perceptions towards the performance of the COVID-19 vaccine concerning one's original expectations and establishing the extent to which those expectations are met. The expectation refers to the personal beliefs about the probable outcome of behaviour. It involves the imagined consequences of receiving the vaccination, in which individuals will be free of the COVID-19 virus.

A negative disconfirmation will occur, leading to the vaccination disconfirmation when the individual perceives the vaccination is not likely to meet their expectation. For example, it could happen as the public may get more severe or more negative consequences after the vaccination. In contrast, positive disconfirmation will lead to vaccination satisfaction when the public perceives safety and protection after vaccination. Thus, the following hypothesis is proposed:

H1: Vaccine expectation will be associated positively with vaccine satisfaction.

Perceived Susceptibility

Rosenstock (1974) defined perceived susceptibility as the subjective assessment of the severity of a health issue and its potential consequences. Perceived susceptibility suggests that the more seriously one takes a given health issue, the more one tries to reduce its likelihood of occurrence. This study defines perceived susceptibility as one's subjective risk assessment of being vaccinated. Perceived susceptibility is one of the strongest perceptions for individuals to adopt health behaviour (Rosenstock, 1974). If the disease susceptibility increases, health services in health belief models would also increase.

An individual underestimating the risk of health issues will typically engage in less healthy behaviour. In the same manner, individuals who believe that their health is at risk due to COVID-19 may develop a higher expectation regarding the vaccines' expectation in curbing the COVID-19 pandemic.

To be more specific, the COVID-19 vaccine can help reduce the likelihood of COVID-19 virus infection. Past researchers (Maiman & Becker, 1974; Scherr et al., 2017; Barakat & Kasemy, 2020; Kwok et al., 2021; Prati et al., 2011) acknowledged that during the early stage of a pandemic outbreak, both perceived susceptibility and perceived severity are high; as individuals assessed the pandemic risk are more probable and more severe, they tended to be more compliant with health-related recommendations. This is consistent with HBM, which postulates that individuals' perceptions about susceptibility and severity of disease lead to initiating a particular course of preventive behaviour. Individuals who believe that their health is at risk due to the COVID-19 virus may form a higher perception of the vaccination uptake that it helps them to prevent the virus's effects.

Perceived Severity

Perceived severity is a subjective assessment of the health issue's severity and potential consequences (Champion, 1984). The more seriously one takes a given health issue, the more one tries to reduce its likelihood of occurrence. Perceived severity suggests that if the individual underestimates disease risk, they will be less likely to engage in healthy behaviour. This study defines perceived severity as the seriousness of not being vaccinated. Past researchers (Kwok et al., 2021; Prati et al., 2011; Duan et al., 2020) found that individuals' risk perception significantly influences their motivation to take precautions against the virus infection. Individuals tend to respond more negatively to an action that incurs risk (e.g., getting vaccinated) than to inaction that incurs risk (e.g., not getting vaccinated and risking getting COVID-19). Mostafapour et al. (2019) acknowledged that the information highlighting benefits can increase the intention to be vaccinated against COVID-19, thus lowering the perceived severity.

The HBM model posits that individuals' perceptions about susceptibility and disease severity lead to initiating a particular course of preventing behaviour. The severity of illness is likely to strongly determine individuals' expectations that the virus infection may likely infect them. The public believes the COVID-19 virus is a health problem with severe consequences (Mostafapour et al., 2019); the higher perceived severity of COVID-19 was related to greater vaccine expectation. Therefore, it will automatically increase their expectation to get the vaccination to improve and control their health. Thus, the following hypotheses are proposed:

H2: Perceived susceptibility will be negatively associated with vaccine expectation.

H3: Perceived severity will be associated negatively with vaccine expectation.

Self-Efficacy

Self-efficacy is the individual's belief that they possess the skills and abilities to perform a specific task successfully. Schunk et al. (2006) suggested that individuals who develop

self-efficacy are more likely to participate readily in that activity, work harder, and persist longer when encountering difficulties. Self-efficacy plays a crucial role when individuals try to complete some tasks or challenges (Bandura, 1977). Self-efficacy is dynamically developed from external experiences, self-perception and others' persuasion (Higgins et al., 2016).

Past researchers found that individuals with higher expertise are more likely to provide useful vaccine advice (Higgins et al., 2016; Cheung et al., 2018). Equally, individuals are less likely to share their ideas on vaccinations if they feel they lack information about vaccines useful to others. In sum, self-efficacy determines an individual's vaccine expectation, influencing their satisfaction. This study defines self-efficacy as self-assessment of their ability and confidence to be vaccinated (COVID-19 vaccine). Individuals gain confidence in accepting vaccines and raise self-efficacy when they understand the importance of vaccines.

The study of Bandura (1977) suggested that the individual's cognition of a situation significantly impacts the action outcome. Individuals with significant knowledge are more likely to expect positive outcomes. Self-efficacy and outcome expectancy have separate impacts on the individual's behaviour. Bandura (1977) suggested that self-efficacy directly affects the outcome expectancy (Stone & Henry, 2003). Past studies show that self-efficacy positively predicts outcome expectations (Cheung et al., 2018). The higher the anticipation, the higher the tendency to make considerable efforts. Thus, the following hypothesis is proposed:

H4: Self-efficacy will associate positively with vaccine expectation.

Perceived Barriers

Perceived barriers are defined as one's perception of the potential negative consequences of the COVID-19 vaccine. The perceived barriers include the medical cost, the side effects of the medical procedures, and the discomfort of receiving or changing the health behaviour. These barriers will constrain the individual from developing a favourable impression of the vaccine's performance.

Past studies suggested that when individuals perceive too many difficulties or constraints in health-changing behaviour, the perception will cause them to have less motivation to accept change (Penfold et al., 2011; Nugrahani et al., 2017). Rosenstock et al. (1988) suggested that perceived barriers increase if individuals perceive the higher risk prompts them to get an undesirable course. Past researchers (Machingaidze et al., 2021; Kreps et al., 2021), in a similar study on the vaccination for COVID-19, suggested that one of the more formidable barriers faced by individuals to receive the vaccines is the side effects of vaccination. It is acknowledged that developing vaccines requires intensive resources and decades in initial development to final licensure. However, due to the severity of COVID-19, vaccinations have been launched quickly to curb this global pandemic. This caused the public concern about the side effects of the vaccination. The study by Dror et al. (2020) indicated that most participating medical staff have highly sceptical opinions on the effectiveness of vaccines towards COVID-19. One of the rationales for their doubt about the vaccination's effectiveness is the rapidly-developed vaccine. Moreover, misinformation is also one of the contributors to the negative perception towards the COVID-19 vaccination. Misconception on the vaccines has created confusion among the public, especially towards the safety of the immunisation (Kreps et al., 2021). Hence, individuals tend not to favour vaccine uptake. Thus, the following hypothesis is proposed:

H5: Perceived barriers will be associated negatively with vaccine expectations.

Perceived Benefits

Perceived benefits assess the value or efficacy of engaging in a health-promoting behaviour to decrease the risk of diseases (Penfold et al., 2011; Nugrahani et al., 2017). For example, suppose an individual believes a particular action will reduce susceptibility to a health

issue or decrease its seriousness. In that case, the individual is likely to be involved in that behaviour regardless of objective facts regarding the effectiveness of the action. In this study, perceived benefits are defined as one's perceptions of the effectiveness of the COVID-19 vaccine.

Past studies (Jose et al., 2021; Lau et al., 2020) suggested that most respondents were most likely to benefit from healthy behaviours as they have a clearer understanding and awareness of particular health issues. The study by Byidry et al. (2021) indicated an effect of perceived benefits and the use of vaccines. Individuals who felt the help of the vaccine in avoiding COVID-19 would prefer to take action. Rosenstock et al. (1988) stated that individuals would behave if they believed their behaviour was beneficial for themselves and the environment. Still, if the benefits were not appropriate, they would not do the behaviour. The public was encouraged to take the vaccine to prevent COVID-19 infection and feel safe after conducting the vaccination.

Furthermore, perceived benefits encourage them to have more favourable insights into accepting the changes in behaviour. Perceived benefits suggest that individuals with a better and clearer understanding of the COVID-19 vaccination will be more favourable and have higher expectations of the COVID-19 vaccine. Thus, the following hypothesis is proposed:

H6: Perceived benefits will associate positively with vaccine expectation.

METHODOLOGY

This study pursues a quantitative research approach with a descriptive research design. A quantitative approach is deemed appropriate to address how statistical analyses can shape life-sciences vaccination satisfaction perspectives away from a social-justice agenda (Curtis et al., 2022). COVID-19 vaccination is the current buzzword where, to date, there are about 79 per cent of vaccinated adults in Malaysia (MOH, 2021). This study intends to focus on the adults in Malaysia who have completed their two doses of the COVID-19 vaccine. Due to the sensitive topic and hence inaccessibility to the sampling frame of the vaccinated adults, this study opts for the judgmental sampling technique, a typical variation of the non-probability sampling technique. The survey link was given to those who completed their two doses of the COVID-19 vaccine. This study fundamentally adheres to the rule of thumb recommendation given by VanVoorhis et al. (2007), which requires 30 participants per predicting variable. Briefly, this study deems perceived susceptibility, severity, benefits, barriers, and self-efficacy to affect the vaccine expectation and, thus, satisfaction. Accordingly, there are collectively six predictors which affect vaccine satisfaction (Appendix 1). Hence, this study requires 180 participants as the sample size. A pilot study involving 18 participants was conducted upon pre-testing the questionnaire's content.

Also, the Bioequivalence FDA (Food & Drug Administration) Guidance (Julious, 2022) states, 'A minimum number of 12 evaluable subjects should be included in any bioequivalence study'. The current research leverages the heuristic approach (Lakens, 2022) by referring to Bioequivalence FDA Guidance to determine the sample size. SmartPLS_SEM software was applied in this study, which requires ten times the number of paths in the structure model (Hair et al., 2016). There were six paths, so the minimum number of observations was 60. SmartPLS can handle small sample sizes (Hair et al., 2014) and is the best tool for small sample sizes (Hahm et al., 2022) compared to CB-SEM.

The pilot study data assessed the instrument's internal consistency using the Cronbach alpha. All items had good alpha values and were retained for further analysis. The finalised survey form was distributed to target respondents through Google Forms. The gathered data were analysed using the path analysis technique through SmartPLS software.

Data Analysis and Results

This study employs a structural equation modelling (SEM) with variance technique with the SmartPLS software to assess the research model and facilitate multi-group analysis (MGA). First, the assessment involved evaluating the validity and reliability of the reflective measurement models, followed by estimating the structural model.

Measurement Model Assessment

Internal consistency, convergent reliability, and indicator reliability were all examined. If the reflecting indicator's loading is more than 0.5, the item represents the latent construct well (Hair et al., 2010). Many studies reported that factor loadings should be greater than 0.5 (Truong & McColl, 2011) for better results. Kaartina et al. (2015) also considered 0.5 as a threshold for acceptable loadings in the adolescent quality of life study. Ahmed et al. (2022) studied depression and anxiety and accepted 0.5 cutoff factor loadings. Additionally, research assessing attitudes and beliefs toward human HPV vaccination has considered a factor loading of 0.4. So, on the above ground, we have chosen this criterion and one 0 and close to 0.6 for better cut-offs for factor loadings. Rho_A is also a composite reliability indicator computed on unstandardised loadings that should be at 0.7 to be considered reliable, the average variance ex the individuals are satisfied if the expectation is met with a positive intention0.5 (Hair et al., 2011; Hair et al., 2019) indicating that more than half of the overall variance in the construct has been explained. As shown in Table 1, the composite reliability (CR) was examined to obtain reliability after it was deleted, and all of the measures were within the specified range.

Table 1

Measurement model

Constructs	Items	Loadings ^a	AVE ^b	CR ^c	Rho_A ^d
Perceived susceptibility	SUS1	0.677	0.547	0.827	0.745
	SUS3	0.658			
	SUS5	0.773			
	SUS6	0.835			
Perceived severity	SEV1	0.746	0.542	0.875	0.853
	SEV2	0.771			
	SEV3	0.596			
	SEV4	0.770			
	SEV5	0.830			
	SEV6	0.680			
Self-efficacy	SEF1	0.743	0.498	0.856	0.811
	SEF2	0.720			
	SEF3	0.723			
	SEF4	0.690			
	SEF5	0.718			
	SEF6	0.637			
Perceived barriers	BAR4	0.871	0.700	0.875	0.811
	BAR5	0.811			
	BAR6	0.827			

Constructs	Items	Loadings ^a	AVE ^b	CR ^c	Rho_A ^d
Perceived benefits	BEN1	0.634	0.519	0.865	0.834
	BEN2	0.661			
	BEN3	0.697			
	BEN4	0.833			
	BEN5	0.806			
	BEN6	0.667			
Expectation's confirmation	EXP1	0.861	0.644	0.878	0.832
	EXP2	0.829			
	EXP3	0.803			
	EXP4	0.711			
Vaccination satisfaction	SAT1	0.839	0.702	0.934	0.922
	SAT2	0.857			
	SAT3	0.810			
	SAT4	0.763			
	SAT5	0.853			
	SAT6	0.899			

a. All items' loadings > 0.5 indicates indicator reliability, b. All average variance extracted (AVE) > 0.5, c. All composite reliability (CR) > 0.7 indicates internal consistency, d. All Cronbach's alpha > 0.7 indicates indicator reliability. Items removed because indicator items < 0.5 are BAR1, BAR2, BAR3, BAR7, SUS2, SUS4

Structural Model

The bootstrapping technique was used with 5,000 re-samples to verify the stipulated hypotheses. The first tested indirect model included six paths representing the six hypotheses. Table 2 indicates the outcomes path coefficients of and t-test; it can be concluded that hypothesis H1 i.e., the expectation's confirmation -> vaccination satisfaction ($\beta = 0.735$, $t = 16.835$, $p < 0.001$), perceived severity -> expectation's confirmation ($\beta = 0.194$, $t = 2.472$, $p < 0.001$), and self-efficacy -> expectation's confirmation ($\beta = 0.406$, $t = 5.294$, $p < 0.001$), is supported and significant namely 1.69 with a significance level of 5 per cent. A model had a high degree of explanatory power when the R² value was close to 0.75 and a moderate degree of explanatory power when the R² value was close to 0.50. According to this model, the R² for expectation confirmation is 46.8 per cent, and vaccination satisfaction is 53.5 per cent. As a result, the current model adequately explains the latent variables and has a moderate and acceptable level of explanatory power.

Table 2

Direct effect relationships for hypothesis testing

Hypothesis (H)	Std Beta	Std Error	[t-value] [^]	Decision	f ²	R ²	95% CI LL	95% CI UL
H1: Expectation's confirmation -> Vaccination satisfaction	0.735	0.043	16.835**	Supported			0.659	0.801
H2: Perceived susceptibility -> Expectation's confirmation	-0.056	0.084	0.649	Not supported	0.004	-0.004	-0.193	0.084
H3: Perceived severity -> Expectation's confirmation	0.194	0.079	2.472*	Supported	0.038	0.012	0.064	0.326
H4: Self-efficacy -> Expectation's confirmation	0.406	0.076	5.294**	Supported	0.201	0.087	0.281	0.529

Hypothesis (H)	Std Beta	Std Error	[t-value] [^]	Decision	f ²	R ²	95% CI LL	95% CI UL
H5: Perceived barriers -> Expectation's confirmation	-0.078	0.082	0.943	Not supported	0.006	0.001	-0.213	0.054
H6: Perceived benefits -> Expectation's confirmation	0.141	0.097	1.423	Not supported	0.017	0.001	-0.022	0.298

**p<0.01, *p<0.05

R² (Expectation's confirmation = 0.468; Satisfaction = 0.535)

Effect size impact indicators are, according to Cohen (1988), f² values 0.35 (large), 0.15 (medium), and 0.02 (small)

Q² (Expectation's confirmation = 0.275; Satisfaction = 0.364)

Predictive relevance (q²) of predictor exogenous latent variables is, according to Henseler et al. (2009), q² values 0.35 (large), 0.15 (medium), and 0.02 (small)

Table 3 presents the results of indirect effect testing, which revealed that perceived severity and vaccination satisfaction were mediated by expectation confirmation ($\beta = 0.146$, $p < 0.05$). It suggests that a higher level of perceived severity was associated with higher expectations of the vaccination's ability to avert health consequences and improve satisfaction. Also, the results supported an indirect effect of self-efficacy on expectation's confirmation of vaccination satisfaction ($\beta = 0.298$, $p < 0.01$). It encourages the individual expectation of a specific scale of behaviour interventions that begin with a sense of self-mastery action to advocate for self-health.

Table 3

Indirect effect relationships for hypothesis testing

Hypothesis	Std Beta	Std Error	[t-value] [^]	Decision	95% CI LL	95% CI UL
H1, H2: Perceived susceptibility -> Vaccination satisfaction	-0.041	0.061	0.651	Not supported	-0.14	0.061
H1, H3: Perceived severity -> Vaccination satisfaction	0.146	0.060	2.381*	Supported	0.048	0.247
H1, H4: Self-efficacy -> Vaccination satisfaction	0.298	0.058	5.061**	Supported	0.205	0.392
H1, H5: Perceived barriers -> Vaccination satisfaction	-0.056	0.062	0.921	Not supported	-0.16	0.046
H1, H6: Perceived benefits -> Vaccination satisfaction	0.104	0.071	1.417	Not supported	-0.015	0.22

**p<0.01, *p<0.05

The average magnitude of the differences between observed and expected correlations was widely recognised as an absolute measure of the fit criterion. Furthermore, this model demonstrates a tolerance of RMS theta (root mean squared residual covariance matrix of the outer model residuals) of 0.129 for the reflective model; this value is less than 0.12 threshold, which indicates a reasonably well-fitted model (Henseler, 2013).

Vaccine boosters are voluntary in Malaysia (Harun, 2021), and as the two vaccines might not be enough to prevent COVID-19 infection, repeated COVID-19 vaccines are likely to become a part of people's self-health practice. Thus, it is important to assess people's willingness to accept the third dose of the COVID-19 vaccine, denoted as "Get the booster Yes" and "Get the booster No" in Table 4. This study assumes all respondents accepted the COVID-19 booster dose as a starting point. According to the parametric and Welch Satterthwaite test statistics in Table 4, the respondents have no significant difference in accepting the booster vaccine. These findings imply that people believe boosters are essential for long-term protection and reduce the risk of infection while waiting for a definitive solution to COVID-19 infection. This discovery is similar to the study by Rzymiski et al. (2021), who investigated the willingness to receive COVID-19 booster doses in Poland.

Table 4

Multigroup analysis (MGA) of respondents who will receive a COVID-19 vaccination booster against those who will not receive a COVID-19 vaccination booster

Intention to get the booster (3rd dose) vaccine	Path Coefficients-diff (Get the Booster No - Get the Booster Yes)	p-Value original 1-tailed (Get the Booster No vs. Get the Booster Yes)	p-Value new (Get the Booster No vs. Get the Booster Yes)	p-Value (Get the Booster No vs. Get the Booster Yes) [Parametric Test]	p-Value (Get the Booster No vs. Get the Booster Yes) [Welch-Satterthwaite Test]
Expectation's confirmation -> Vaccination satisfaction	0.10	0.116	0.232	0.386	0.233
Perceived barriers -> Expectation confirmation	-0.052	0.609	0.782	0.817	0.78
Perceived benefits -> Expectation's confirmation	0.439	0.023	0.046	0.076	0.054
Perceived severity -> Expectation's confirmation	-0.217	0.864	0.273	0.297	0.295
Perceived susceptibility -> Expectation's confirmation	-0.004	0.505	0.989	0.985	0.984
Self-efficacy -> Expectation's confirmation	-0.064	0.646	0.708	0.758	0.708

Demographic summary of the study

Table 5 summarises the demographic details of this study's target respondents. Of the 180 online survey responses gathered, about half of the respondents were female (54 per cent) and Chinese (49 per cent). In addition, about 64 per cent of them are from households with monthly incomes less than RM7099, and 78 per cent have tertiary education qualifications. Furthermore, about two-thirds of the respondents, besides being 47 years old and younger, are employed.

Table 5

Demographic summary of study population by total sample (N = 180) n (%)

Sex	180 (100%)		
Male	82 (46%)		
Female	98 (54%)		
Monthly Household Income	180 (100%)		
2,500 and below	28 (16%)		
2,501 - 4,849	44 (24%)		
4,850- 7,099	44 (24%)		
7,100 - 10,959	31 (17%)		
10,960 and above	33 (18%)		
Race	Highest Educational Qualification		
Malay	37 (21%)	Secondary School	8 (4%)
Chinese	88 (49%)	Certificate / Diploma	32 (18%)

Sex			180 (100%)
Indian	48 (27%)	Undergraduate	88 (49%)
Others	7 (4%)	Postgraduate	52 (29%)
Total	180 (100%)	Total	180 (100%)
Age		Occupation	
18 - 27	37 (21%)	Employed	131 (73%)
28 - 37	47 (26%)	Unemployed	19 (11%)
38 - 47	59 (33%)	Self-employed	15 (8%)
48 - 57	25 (14%)	Others	15 (8%)
58 - 67	11 (6%)		
68 and above	1 (1%)		
Total	180 (100%)	Total	180 (100%)

CONCLUSION AND DISCUSSION

This study aims to provide information on individuals' expectations of COVID-19 vaccination and satisfaction based on the health belief model (HBM) and expectation disconfirmation theory (EDT). The HBM and EDT integration model is influential in identifying how the public developed their perception, subsequently influencing their satisfaction with vaccination performance. Several important findings are discovered in this study.

According to Rosenstock (1974), proactive health behaviour depends on five core perceptions: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, and general health motivation. This study employed these factors to examine individuals' expectations of COVID-19 vaccination and self-efficacy. Of these factors, it was found that expectation's confirmation, perceived severity, and self-efficacy were significant predictors of an individual's expectation and satisfaction with the COVID-19 vaccination. Table 2 indicates that expectation's confirmation was the important variable for individuals to develop a favourable perception of vaccination and booster intake. It is consistent with the findings of past studies (Serrano et al., 2018; Wang et al., 2021), where expectation indeed motivates the individual's satisfaction towards vaccination. Individuals feel satisfied with the vaccination if they have good expectations about its performance and encourage them to go for booster vaccine to develop stronger immunisation against COVID-19.

Secondly, this study's findings align with the past studies' findings on the significant role of perceived severity. People are taught the importance of the vaccine. Hence, the perception of the negative consequences of vaccination would certainly not affect one's expectation of vaccine uptake. Individuals who accepted the vaccination understood its safety and importance. Similarly, the finding also suggested that fear of COVID-19 was important in encouraging the public to go for the vaccine and booster uptake. Thus, the fear of the severity of COVID-19 infection could also promote vaccination in the community. Health officials (e.g., Ministry of Health and World Health Organization) and private medical organisations advocate for the value of vaccines in preventing severe illness and death as a buffer from the association of perceived severity. Those with a high level of perceived severity are confident in taking the full dose of COVID-19 vaccination to overcome the vaccination barriers (Higgins et al., 2016; Cheung et al., 2018). These relationships are consistent with health behaviour change theory (Chu & Liu, 2021; Ng et al., 2020). Individuals who acknowledge the severity of COVID-19 will estimate the risks of contracting and suffering from this pandemic, motivating them to get the vaccination.

Based on Tables 2 and 3, self-efficacy is associated significantly with COVID-19 expectations and satisfaction. As suggested by past studies (Ng et al., 2020), self-efficacy is one of the main contributors to public behaviour towards multiple types of vaccines. Past researchers (Higgins et al., 2016; Cheung et al., 2018) indicated that continuous vaccination programs,

such as on-site free vaccination at multiple locations, with health education and information dissemination, can increase self-efficacy of vaccination for COVID-19. Individuals with higher self-efficacy of COVID-19 vaccination will demonstrate stronger vaccination satisfaction than those with lower self-efficacy. It empowers individuals to make the correct decision by accepting the vaccination to curb this pandemic. This finding suggests that the government's efforts in combating this pandemic have structured the community to be better educated and accomplished both the vaccination and the booster.

The findings in Tables 2 and 3 also indicate that the public is willing to go for a vaccine booster as they know its long-term effect in curbing this global pandemic. This study's findings on the respondents' willingness for the booster vaccine are consistent with the study of Stämpfli et al. (2021), where almost 88 per cent of the respondents were willing to do an annual booster. This significant finding suggested that the public was satisfied with the information about the COVID-19 vaccination through extensive information sharing via government and private medical organisations. These efforts may contribute significantly to the willingness of the public to take the COVID-19 vaccination booster; this is consistent with the study of Al Janabi and Pino (2021), where the majority of respondents are willing to take additional vaccines in the future.

As shown in Tables 2 and 3, perceived susceptibility, perceived barrier, and perceived benefits found no relationship between vaccination uptake and satisfaction (Nugrahani et al., 2017). The assurance from national (Malaysian Ministry of Health) and global (WHO) authorities, alongside the trend of people being vaccinated worldwide, have urged individuals to "accept" vaccines. Subsequently, their perception of risk assessment, barriers, and benefits does not significantly affect their COVID-19 vaccine uptake.

There were some statistically non-significant results. The perceived susceptibility (H1, H2) shows insignificant results, implying that people believe they would not be at risk of getting the COVID-19 vaccination. This is due to the government's consistent and effort in advocating the safety evidence to the public about the COVID-19 vaccination, potentially reducing the risk perception of getting vaccinated (French et al., 2020; Suliman et al., 2021). Perceived barriers do not affect vaccination satisfaction, indicating that people do not perceive any negative consequences from receiving the COVID-19 vaccination. The large scale of the nationwide COVID-19 vaccination campaign, which was well facilitated by easily accessible centres, mobile application appointments, digital vaccination certification, and collaboration with private life-science organisations (Jayasundrara, 2021), as well as Malaysia's low mortality after vaccination (Lim, 2021), play an important role in influencing perceived barriers to getting vaccinated. Perceived benefits have no significant influence on vaccination satisfaction, as the existing safety profile of the COVID-19 vaccine cannot eliminate the illness. The main reason for vaccine uptake is healthcare professional advocacy. According to Marzo et al. (2021), the healthcare professional's recommendation was responsible for 95.7 per cent of Malaysians receiving the COVID-19 vaccine.

The vaccine update is technically compulsory to achieve herd immunity to reduce the infection rate and curb the spread of the COVID-19 virus. The progressive publicity on the importance of COVID-19 vaccination in the fight against this global pandemic has minimised individuals' subjective risk assessment. Thus, it does not affect the public's expectation's confirmation or satisfaction. The insignificant relationship between perceived susceptibility to vaccination uptake and satisfaction is similar to past studies (Schimid et al., 2017; Chapman et al., 2006; Weinstein et al., 2007), which investigated influenza vaccination among college students. Additionally, other pushing factors, such as the economic factor and social media role, were considered in these past studies.

The rapidly ongoing awareness campaign and worldwide vaccination practice significantly reduce the individual's risk assessment towards the vaccination and boosts their confidence in accepting the vaccine. Individuals tend to be more concerned about the general population in assessing the global pandemic's societal threat in terms of susceptibility. They gauge the possibility of the general public being influenced by information correction, which aims to amplify correct information and counteract harmful or irrelevant erroneous media content.

In this study, perceived barriers and benefits showed different results from the past studies on a similar topic. The findings suggested that the sense of urgency cultivated by the global and local authorities, as well as medical bodies, encouraged the public to uptake the vaccination against the COVID-19 virus spread instead of pondering the possible challenges and difficulties in receiving the vaccination. Besides the vaccination programs and awareness campaigns, the economic factor also played an important role in making the insignificant relationship between both assessments on the vaccination uptake. Due to the government restrictions on the standard operating procedures at the workplace, employers and employees are required to complete both vaccinations before the business can resume as usual (Nasrun et al., 2021). This new norm has influenced individuals to place aside their assessment of the vaccination's pros and cons and focus more on economic survival. Moreover, the international and local authorities imposed travel bans prohibiting individuals who do not complete their vaccination from crossing the national borders; these bans may have also contributed to the insignificant role of perceived barriers and benefits (Nasrun et al., 2021).

The insignificant outcome of perceived barriers is in line with the positive development in the vaccination in reducing the severity of the virus spread. It implies that when the community receives support from their surroundings, they may find it easier to overcome any vaccination-related barriers (Schaefer et al., 2013). Notably, the external factor may be one of the crucial contributors to this health behaviour since COVID-19 vaccination had a large amount of media coverage associated with it (Kwok et al., 2021).

Implications

Globally, the pandemic remains tough, driven by variations but aided by vaccination. COVID-19 vaccine booster uptake is contingent upon individuals assessing, responding, and ultimately deciding, following their satisfaction with two initial vaccine doses. Our results indicate that the components contributing to vaccine satisfaction prediction include self-efficacy and perceived severity. While self-efficacy strongly influences booster uptake decisions, previous uptake experience reinforces confidence in booster uptake. In addition, the perceived severity of not accepting the booster endangering one's health and the goodness of the community was well understood. Continued focus on self-efficacy and perceived severity will increase public understanding of the benefits of vaccine boosters, assisting in developing more resilient and sustainable herd immunity.

COVID-19 vaccinations successfully minimise the spread of COVID-19 and keep those infected from becoming extremely ill. However, due to the lack of evidence regarding the duration of protection for those vaccinated, a nationwide campaign to educate people about the importance of building a strong immune system through the consumption of nutritious foods and over-the-counter products such as Vitamin C is essential.

These measures are critical in preventing COVID-19 and outweigh the danger of severe illness. Additionally, maintaining reinforcement and collaboration with healthcare professionals to generate multi-communication integration, such as highly specialised vaccination against COVID-19, helps reduce the risk of contracting and transmitting the viruses. Simultaneously, vaccine recipients should act as role models by sharing their experiences through multiple communication platforms, significantly contributing to the pandemic containment. Community pharmacists serve as one of the first contacts for healthcare information and ease the myths surrounding the COVID-19 vaccination and booster and the relevant COVID-19 information to people. Furthermore, reliable information from healthcare professionals in communicating the seriousness of COVID-19, for example, long-term symptoms, would promote a higher level of perceived severity and hence increase the public's precautionary behaviour.

Thus, above-the-line communication contributes to increased self-efficacy in community health and self-care. However, it demands high self-efficacy, which can be obtained through empowerment with an action-oriented sense of purpose. One may reinforce the subconscious through below-the-line touchpoints by

placing COVID-19 vaccination educational collaborators in community pharmacies, clinics, and business locations. In addition, it will create a strong perception of the danger associated with contacting COVID-19 and will drive avoidance behaviour.

Limitations and Recommendations

Despite the study's relevant practical and theoretical implications, some limitations must be acknowledged. First, the COVID-19 pandemic is a global health crisis that results in an indefinite population for investigation. Typically, a survey-based study on the indefinite population requires responses from 385 sampling elements. However, this study was based on the 180 survey responses. Future researchers are encouraged to opt for a large-scale survey, preferably investigating the public behaviour from several countries to generalise the findings more meaningfully. The vaccine administration has expanded to a broader target range of adolescents and children. Nevertheless, the current results are based on adults' responses towards the vaccination. Therefore, future researchers may consider the parents' responses towards their children's vaccination. Additionally, investigating the physiological aspects of the vaccine's recipient is also recommended for future studies.

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Appendix 1

Measurement items	SD	D	N	A	SA
SUS1: Vaccine poses a danger in general.	1	2	3	4	5
SUS2: The vaccine will have an impact on my health.	1	2	3	4	5
SUS3: If I get vaccinated, I am going to die.	1	2	3	4	5
SUS4: The vaccine is not safe if I am unaware of my health condition (e.g. chronic disease).	1	2	3	4	5

Measurement items	SD	D	N	A	SA
SUS5: If I have allergies, I should not get vaccinated.	1	2	3	4	5
SUS6: If I am on long-term medicine, I should not get vaccinated.	1	2	3	4	5
SEV1: The COVID-19 pandemic is harmful to us if we do not get vaccinated.	1	2	3	4	5
SEV2: The COVID-19 pandemic appears to have no end unless everyone gets fully vaccinated.	1	2	3	4	5
SEV3: I am scared I will die if I do not get vaccinated.	1	2	3	4	5
SEV4: I am scared I will get seriously ill if I do not get vaccinated.	1	2	3	4	5
SEV5: I am worried my family and friends will be infected if they are not vaccinated.	1	2	3	4	5
SEV6: If everyone is not vaccinated, the number of positive COVID-19 cases will rise.	1	2	3	4	5
BEN1: The COVID-19 vaccine helps me from getting seriously ill even if I am reinfected with the virus.	1	2	3	4	5
BEN2: The Covid-19 vaccine is completely safe.	1	2	3	4	5
BEN3: The COVID-19 vaccine is effective to prevent the spreading of the virus	1	2	3	4	5
BEN4: The Covid-19 vaccine protects me from putting my life in danger.	1	2	3	4	5
BEN5: Vaccinating myself will protect those around me.	1	2	3	4	5
BEN6: Getting vaccinated will make me less afraid of contracting the Covid-19 virus.	1	2	3	4	5
BAR1: I am concerned about possible side effects such as diarrhoea, fever, body soreness, and others.	1	2	3	4	5
BAR2: My current health condition may not be compatible with the Covid-19 vaccine.	1	2	3	4	5
BAR3: Visiting a vaccination centre increases the chances of being infected.	1	2	3	4	5
BAR4: Overall, getting vaccinated is inconvenient.	1	2	3	4	5
BAR5: Overall, getting vaccinated will be uncomfortable.	1	2	3	4	5
BAR6: I am generally opposed to the idea of getting any vaccine.	1	2	3	4	5
BAR7: I am worried I will be given an empty jab.	1	2	3	4	5
INF1: I have shared the COVID-19-related information that I later discovered to be false.	1	2	3	4	5
INF2: I have shared the COVID-19-related content on social media that appeared to be factual at the time but was later shown to be false.	1	2	3	4	5
INF3: I shared the COVID-19-related information on social media that was exaggerated, but I had no idea it was exaggerated at the time.	1	2	3	4	5
INF4: I made every effort to verify the sources of the Covid-19 data I obtained.	1	2	3	4	5
INF5: I immediately disseminate the COVID-19-related information to others.	1	2	3	4	5
INF6: I trust all COVID-19-related information acquired from official sources (e.g. WHO, Government, Mainstream Media).	1	2	3	4	5
INF7: I trust all COVID-19 information gained from unauthorised sources (e.g. sharing via WhatsApp, posting on social media and others).	1	2	3	4	5
EXP1: My whole vaccination experience was better than I had anticipated.	1	2	3	4	5
EXP2: My vaccine expectations were mostly met.	1	2	3	4	5
EXP3: The apparent benefits of the COVID-19 vaccine were greater than I had anticipated.	1	2	3	4	5

Measurement items	SD	D	N	A	SA
EXP4: The negative effects of the Covid-19 vaccine were lower than I had anticipated.	1	2	3	4	5
SAT1: The vaccination process has met my expectations.	1	2	3	4	5
SAT2: I am satisfied with the vaccination services that I received.	1	2	3	4	5
SAT3: The vaccination arrangement is satisfactory to me.	1	2	3	4	5
SAT4: I will encourage people around me to be vaccinated.	1	2	3	4	5
SAT5: I am satisfied with the care I received when getting vaccinated.	1	2	3	4	5
SAT6: The vaccination procedure has met my expectations.	1	2	3	4	5
SEF1: Getting myself vaccinated has been an easy process.	1	2	3	4	5
SEF2: It is easy for us to get vaccinated in Malaysia.	1	2	3	4	5
SEF3: Registering for vaccinations is a simple process for me.	1	2	3	4	5
SEF4: I could go to the vaccination centre on my own.	1	2	3	4	5
SEF5: I had easy access to the vaccination centre assigned to me.	1	2	3	4	5
SEF6: I always refer to the MySejahtera app whenever I need any information on the Covid-19 vaccine.	1	2	3	4	5

DEVELOPMENT OF ADULT EMOTION REGULATION INSTRUMENT

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ABSTRACT

Amidst the COVID-19 pandemic, social isolation due to quarantine measures has severely impacted individuals' mental health in regulating (controlling) their negative emotions. Emotion regulation is crucial for well-being and can be influenced by factors such as mindfulness, diet and music. However, no study has simultaneously explored the relationship between emotion regulation, plant-based diet, and music. This study aims to develop a valid and reliable emotion regulation instrument incorporating a plant-based diet and music to assess adult emotion regulation levels. The instrument is developed by adopting and adapting 5 existing emotion regulation instruments, resulting in 20 items and 12 items of diet and music. The content validity of the instrument is achieved through expert validation. Face validity is assessed using face-to-face focus group discussions of 6 respondents with different genders, ethnicities and age groups. The Reliability is tested based on Cronbach Alpha and Exploratory Factor Analysis using pilot (50 respondents) and main (349 respondents) study data. Cronbach Alpha of 0.9 shows high internal consistency. Exploratory Factor Analysis identified two factors contributing to emotion regulation: "Emotion Overwhelm" and "Emotion Awareness Proficiency." The findings from the correlation analysis revealed moderate significant relationships between emotion regulation and plant-based diet but weak correlation with music, respectively. This study sheds light on the complex relationship between emotion regulation, plant-based diet, and music, providing valuable insights for interventions promoting emotional well-being and mental health.

Keywords: Emotion regulation instrument, diet preference, music, mental health

INTRODUCTION

The COVID-19 pandemic has led to widespread social isolation, negatively impacting individuals' mental health (Wang et al., 2020; McKibbin & Fernando, 2020; Mazza et al., 2020). Emotion regulation is the ability to manage and adjust one's emotions, has been shown to mitigate these effects (Garnefski & Kraaij, 2016; Gresham & Gullone, 2012; Hartley & Phelps, 2010; Yang et al., 2020; Kashdan & Rottenberg, 2010). Emotion regulation is crucial for well-being and can be influenced by factors such as mindfulness, diet and music.

A plant-based diet has gained popularity and is associated with positive mental health outcomes (Lai et al., 2014; Lassale et al., 2018; Mason-D'Croze et al., 2019; Peltzer & Pengpid, 2017; Shen et al., 2021). Several studies have linked a plant-based diet to better emotional health, suggesting it may improve emotion regulation (Giraldo et al., 2019).

Music is another significant factor influencing emotion regulation, with research showing its ability to evoke and regulate various emotions (Laurua, 2023; Hesmondhalgh, 2013; Cook et al., 2017; Zoteyeva et al., 2015; Silverman, 2019; Sakka & Juslin, 2018; Skanland, 2013). Music has been found to aid in emotion regulation, reducing stress and improving well-being (Chin & Rickard, 2013).

In this context, recent studies have explored the connection between a plant-based diet and emotion regulation, as well as the influence of music on emotional well-being.

Understanding these relationships can offer valuable insights into promoting better mental health and emotion regulation during challenging times like the COVID-19 pandemic.

However, no studies connected the three factors simultaneously: emotion regulation, plant-based diet, and music. Based on past studies, there were several instruments to evaluate adult's emotion regulation. The Emotion Regulation Questionnaire (ERQ) designed by Gross and John (2003) is a widely used measure of emotion regulation. It assesses individuals' tendencies to use two cognitive strategies, reappraisal and suppression, to regulate their emotions. Reappraisal involves changing one's emotional response to a situation by reinterpreting its meaning, while suppression involves inhibiting the expression of one's emotional response. The Difficulties in Emotion Regulation Scale (DERS), designed by Gratz and Roemer (2004), is another widely used measure of emotion regulation that assesses individuals' difficulties in regulating emotions. The Cognitive Emotion Regulation Questionnaire (CERQ), designed by Garnefski et al. (2001), measures individuals' cognitive strategies for regulating their emotions. The Cognitive Emotion Regulation Questionnaire - Short (CERQ-short) was proposed by Garnefski and Kraaij (2006), which measures cognitive strategies used to regulate emotions in response to stressful events. The Behavioural Emotion Regulation Questionnaire (BERQ) was designed by Gross and John (2003) to measure various strategies individuals use to regulate their emotions behaviourally. The Interpersonal Emotion Regulation Questionnaire (IERQ) was developed by Hofmann et al. (2016) to measure how individuals regulate their emotions in interpersonal relationships. Previous instruments looked into the perspectives they wished to explore, but no instruments simultaneously included the recent connection between plant-based diet and music with emotion regulation.

Based on our review of past studies connected to existing instruments, we noticed that the existing instruments lacked consideration of the new factors other researchers have found in recent years. As all the instruments were developed more than five years ago, they might lack certain new factors that affect people's emotion regulation. Therefore, this study aims to adopt and adapt the existing emotion regulation instruments by simultaneously including plant-based diet and music. The purpose is to develop a valid and reliable emotion regulation instrument incorporating a plant-based diet and music to assess adult emotion regulation levels.

METHODOLOGY

The instrument is developed by adopting and adapting 5 existing emotion regulation instruments, resulting in 20 items and 12 items of diet and music. Table 1 lists the instrument constructs and a number of items.

Table 1

Instruments Constructs and Number of Items

Instrument	Construct	Number of Items
Emotion Regulation Questionnaire (ERQ)	Cognitive Reappraisal facet	5 items
	Expressive Suppression facet	5 items
Difficulties in Emotion Regulation Scale (DERS)	Non-acceptance of emotional responses	5 items
	Difficulties engaging in goal-directed behaviour	6 items
	Impulse control difficulties	6 items
	Lack of emotional awareness	5 items

Instrument	Construct	Number of Items
	Limited access to emotion regulation strategies	6 items
	Lack of emotional clarity	8 items
Cognitive Emotion Regulation Questionnaire (CERQ)	Self-blame	4 items
	Acceptance	4 items
	Rumination	4 items
*Cognitive Emotion Regulation Questionnaire - Short (CERQ-short)	Positive refocusing	4 items
The same constructs but only 2 items per construct instead of 4 items	Planning	4 items
	Positive reappraisal	4 items
	Putting into perspective	4 items
	Catastrophising	4 items
	Blaming others	4 items
	Seeking Distraction	4 items
Behavioural Emotion Regulation Questionnaire (BERQ)	Withdrawal	4 items
	Actively Approaching	4 items
	Seeking Social Support	4 items
	Ignoring	4 items
	Enhancing Positive Affect	5 items
Interpersonal Emotion Regulation Questionnaire (IERQ)	Perspective Taking	5 items
	Soothing	5 items
	Social Modelling	5 items
Our Instrument	Growth Mindset	4 items
	Overwhelmed by Emotions	4 items
	Intensity of Emotions	4 items
	Self-Soothing	4 items
	Lack of Emotional Awareness	4 items
	Diet & Music	12 items

Five constructs are developed: growth mindset, feeling overwhelmed by emotions, the intensity of emotions, self-soothing, and lack of emotional awareness. Items are selected from existing instruments, such as the Cognitive Emotion Regulation Questionnaire, the Difficulties in Emotion Regulation Scale, the Emotion Regulation Questionnaire, the Behavioural Emotion Regulation Questionnaire, and the Interpersonal Emotion Regulation Questionnaire.

The Growth Mindset construct assesses individuals' beliefs in their capacity for growth in emotional regulation skills through effort and practice. Items Q1, Q6, Q11, and Q16

explore their mindset and motivation towards enhancing emotional regulation abilities, providing insights for interventions and strategies that foster a growth-oriented outlook.

The Overwhelmed by Emotions construct examines how individuals perceive and react to strong emotional states. Items Q2, Q7, Q12, and Q17 offer insights into the challenges individuals face when managing overwhelming emotions, guiding the development of interventions to support effective emotion regulation.

The Intensity of Emotions construct explores individuals' perceptions of the intensity of their emotional experiences compared to others. Items Q3, Q8, Q13, and Q18 provide insights into emotional intensity levels and their impact on emotion regulation processes, informing strategies to promote effective management.

The Self-Soothing construct assesses individuals' ability to comfort and support themselves during times of distress. Items Q4, Q9, Q14, and Q19 offer insights into self-soothing abilities and behaviours, guiding the development of interventions for emotional well-being.

The Lack of Emotional Awareness construct explores difficulties in identifying, understanding, and articulating emotions. Items Q5, Q10, Q15, and Q20 inform strategies that promote emotional self-awareness, recognition, and expression. A ten-point numerical scale measures the items, ranging from "Strongly Disagree 1 2 3 4 5 6 7 8 9 10 Strongly Agree".

Our instrument also includes sections that explore respondents' diet preferences and attitudes toward music, as both factors can be linked to emotion regulation. Understanding individuals' dietary patterns, such as plant-based diets, and their subjective experiences related to diet can provide insights into how diet impacts emotion regulation. Similarly, exploring the role of music as an emotion regulation tool and its influence on emotional well-being. The relationship between diet, music, and emotion regulation will be investigated to gain a comprehensive understanding of their interplay. Table 2 outlines the items according to the constructs we developed for our Emotion Regulation Instrument.

Table 2

Constructs and Items of Emotion Regulation (Our Instrument)

Construct	No.	Item
Growth Mindset	Q1	I can improve my ability to regulate my emotions with effort and practice.
	Q6	I try to learn from my experiences to improve my ability to regulate my emotions.
	Q11	I believe that my ability to regulate my emotions can change over time.
	Q16	I believe my emotions can be managed effectively using different strategies.
Overwhelmed by Emotions	Q2	When I experience strong negative emotions, I feel like I cannot handle them.®
	Q7	I get overwhelmed when I experience strong negative emotions.®
	Q12	I have trouble thinking clearly when I experience strong emotions.®
	Q17	When I experience strong emotions, I feel like I am out of control.®
Intensity of Emotions	Q3	I experience negative emotions very intensely.®
	Q8	Once I start feeling an emotion, it is hard for me to control how intense it gets.®
	Q13	I get easily overwhelmed by my emotions.®

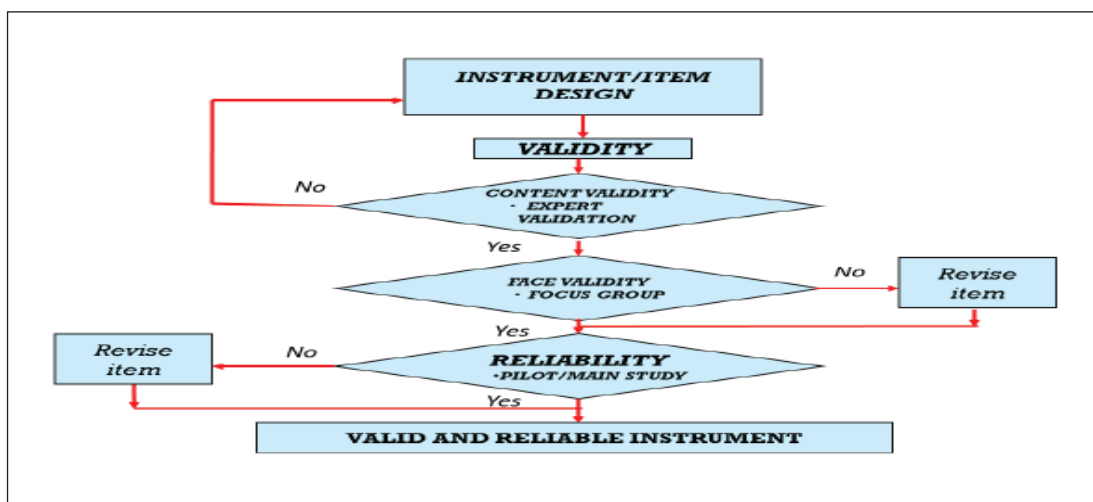
(continued)

Construct	No.	Item
Self-Soothing	Q18	I found that my emotions are more intense than other people's emotions. ®
	Q4	When I am upset, I try to comfort myself by doing things that make me feel better.
	Q9	I know how to calm myself down when I am feeling anxious or upset.
Lack of Emotional Awareness	Q14	I try to be kind and supportive of myself when experiencing difficult emotions.
	Q19	When I am upset, I take time to care for myself and my needs.
	Q5	I have trouble identifying what I am feeling. ®
	Q10	I sometimes feel like I do not really know what I am feeling. ®
	Q15	I have trouble putting my emotions into words. ®
	Q20	Sometimes, I feel disconnected from my emotions. ®
Diet & Music		1. Diet Preferences:
		a. Vegan (excludes all types of foods that contain animal products and animal by-products)
		b. Vegetarian (excludes all types of foods that contain animal products but consists of animal by-product (e.g.: milk, egg, cheese, etc.))
		c. Pescatarian (excludes all types of meat except seafood. (e.g.: fish, squid, shrimp, etc.))
		d. Flexitarian (mainly in a plant-based diet, but small amounts of meat, fish, eggs, and dairy can be included as desired.)
		e. Meat eater (major in having meat and less in plant-based diet)
	2. On average, how often per week do you have a plant-based diet (fruits and vegetables)?	
	3. When I eat fruits and vegetables, I feel: Sick 1-10 Healthy. Tired 1-10 Energetic	
	4. Do you like to listen to music?	
	5. How frequently do you listen to music in a week? (average)	
	6. When I listen to music, I feel: Sad 1-10 Happy Anxious 1-10 Calm	

Next, our instrument is evaluated based on Figure 1. The instrument's content validity is achieved through expert validation with a psychology background. Face validity is assessed using face-to-face focus group discussions of 6 respondents with different genders, ethnicities, and age groups. The Reliability is tested based on Cronbach Alpha and Exploratory Factor Analysis using pilot (50 respondents) and main (349 respondents) study data. The respondents are selected randomly at Perlis using systematic sampling. Our instrument also includes a demographic section of gender, ethnicity, age group, education level, marital status, employment status, and monthly income.

Figure 1

Instrument Validity and Reliability Process



RESULTS AND DISCUSSION

Table 3 displays the respondent's profiles for the main study, involving 349 respondents.

Table 3

Respondent Profiles

Demographic	Frequency	Per cent
Gender		
Male	172	49.3
Female	177	50.7
Ethnicity		
Malay	224	64.2
Chinese	88	25.2
Indian	28	8.0
Others	9	2.6
Age		
18-30	124	35.5
31-45	101	28.9
46-50	41	11.7
51-65	58	16.6
66 or older	25	7.2
Education Level		
No formal education	14	4.0
Primary	21	6.0
Secondary	111	31.8
Tertiary	203	58.2
Marital Status		
Single	155	44.4
Married	177	50.7
Divorced	6	1.7
Widowed	11	3.2
Employment Status		
Student	82	23.5
Employed	209	59.9
Unemployed	31	8.9
Retiree	27	7.7
Monthly Income		
No Income	77	22.1
Less than RM1,000	32	9.2
RM1,000 - RM2,999	101	28.9
RM3,000 - RM4,999	55	15.8
RM5,000 - RM6,999	48	13.8
RM7,000 - RM9,999	24	6.9
RM10,000 above	12	3.3

The Cronbach Alpha of 0.914 (pilot) and 0.932 (main study) shows high internal consistency. However, Exploratory Factor Analysis (EFA) identified only two factors contributing to emotion regulation, although initially, we developed 5 constructs by adopting and adapting from existing instruments. When we comprehensively examined the EFA results, the two factors are suitable and can be named “Emotion Overwhelm” and “Emotion Awareness Proficiency”. Table 4 displays the 2 new constructs according to the items. “Emotion Overwhelm” consisted of 12 items, which are Q2, Q3, Q5, Q7, Q8, Q10, Q12, Q13, Q15, Q17, Q18, Q20 and all describe aspects of feeling overwhelmed by negative emotions, difficulty in identifying and controlling emotions, and experiencing strong emotions intensely. The remainder of the 8 items belong to the second construct, “Emotion Awareness Proficiency” (Q1, Q4, Q6, Q9, Q11, Q14, Q16, Q19), which centres around the awareness and regulation of emotions. They describe the ability to improve emotional regulation through self-awareness, learning from experiences, applying effective strategies, and being kind and supportive of oneself.

Table 4

Summary of New Construct for Our Emotion Regulation Instrument

Construct	No.	Item	Number of Items
Emotion Overwhelm	Q2	When I experience strong negative emotions, I feel like I cannot handle them.®	12
	Q3	I experience negative emotions very intensely.®	
	Q5	I have trouble identifying what I am feeling.®	
	Q7	I get overwhelmed when I experience strong negative emotions.®	
	Q8	Once I start feeling an emotion, it is hard for me to control how intense it gets.®	
	Q10	I sometimes feel like I do not really know what I am feeling.®	
	Q12	I have trouble thinking clearly when I experience strong emotions.®	
	Q13	I get easily overwhelmed by my emotions.®	
	Q15	I have trouble putting my emotions into words.®	
	Q17	When I experience strong emotions, I feel like I am out of control.®	
	Q18	I found that my emotions are more intense than other people’s emotions.®	
	Q20	Sometimes, I feel disconnected from my emotions.®	
Emotion Awareness Proficiency	Q1	I can improve my ability to regulate my emotions with effort and practice.	8
	Q4	When I am upset, I try to comfort myself by doing things that make me feel better.	
	Q6	I try to learn from my experiences to improve my ability to regulate my emotions.	
	Q9	I know how to calm myself down when I am feeling anxious or upset.	
	Q11	I believe that my ability to regulate my emotions can change over time.	
	Q14	I try to be kind and supportive to myself when I am experiencing difficult emotions.	
	Q16	I believe my emotions can be managed effectively using different strategies.	
	Q19	When I am upset, I take time to care for myself and my needs.	

The findings from the correlation analysis show moderate (0.5) significant relationships between emotion regulation and plant-based diet but weak (0.2) significant correlations with music, respectively. A plant-based diet is often associated with a healthier lifestyle, including regular exercise and better stress management. Individuals who adopt a plant-based diet may be more conscious of their overall

well-being, leading to improved emotion regulation. However, its impact varies due to individual differences and environmental factors. This study also found that approximately 80% of respondents liked music, but it is essential to recognise that music preferences are highly subjective and personal. The impact of music on emotion regulation can vary significantly from person to person, leading to a weaker overall correlation in the data.

CONCLUSION

Successfully, we have developed a valid and reliable adult emotion regulation instrument by adopting and adapting from 5 existing instruments and incorporating diet (plant-based) and music. The content validity is achieved through expert validation with a psychology background and face validity through focus group discussion with 6 respondents (different genders, ethnicities and age groups). The reliability based on the Cronbach Alpha of 0.9 indicates high internal consistency, but Exploratory Factor Analysis only identified 2 factors and not 5 as initially designed. Thus, the investigation is conducted, and the 2 factors are suitable to be the instrument constructs, which we named "Emotion Overwhelm" and "Emotion Awareness Proficiency." The correlation analysis revealed moderately significant relationships between emotion regulation and plant-based diet but a weak correlation with music. Hence, it requires further studies and considering other factors, such as exercise and religious practices in the future. This study sheds light on the complex relationship between emotion regulation, plant-based diet, and music, providing valuable insights for interventions promoting emotional well-being and mental health.

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COMMUNITY CORRECTIONS INMATES' PRISON CLIMATE AND LIFE SATISFACTION, MEDIATED BY SOCIAL SUPPORT: STRUCTURAL EQUATION MODEL ANALYSIS

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ABSTRACT

The greater focus on community corrections aligns with Malaysia's goal of reducing the rate of recidivism within the nation. The initiative is part of the prison reforms enhancing community correction, in which two-thirds of inmates will engage by 2030. Previous research has linked social support to prison climate and life satisfaction, making it essential for implementation. Thus, this study examines whether social support affects the prison climate and life satisfaction. Cross-sectional surveys were used in this quantitative study. This research involved a total of 380 Malaysian inmates. Respondents are selected using a sampling framework and a simple random sampling method. The proposed model and research hypotheses are evaluated using IBM SPSS AMOS 25 and structural equation modelling (SEM). The results demonstrate that social support fully mediates the association between the prison climate and life satisfaction among Malaysian inmates. Based on the study findings, it is suggested that the Malaysian Prisons Department develop appropriate policies and strategies to enhance prison climate and social support to increase inmate life satisfaction. The described situation is consistent with the Malaysian government's goal of Malaysia Madani, which seeks to tackle the difficulties faced by the population and promote national progress.

Keywords: life satisfaction, social support, prison climate, community corrections, Malaysian inmates

INTRODUCTION

The Malaysian Prison Department enforces sentences imposed by competent authorities as part of the criminal justice system. The agency implements rules and regulations to ensure the proper and equal implementation of punishments. The prison institutions must ensure security, safe custody, and humane treatment for all inmates serving their sentences (Malaysia Prison Department, 2023). In the bargain, the Malaysian Prison Department also provides successful recovery treatment while inmates serve prison sentences and undergo community correction (Jabatan Penjara Malaysia, 2021). Commensurate with most other nations, the recidivism rate is used as a proxy for the effectiveness of the Malaysian Prison Department's operations and roles.

The recidivism rate among prison inmates is 15%, compared with just 0.38% for inmates who undergo community corrections (Bernama, 2022). The situation indirectly presents significant challenges of overcrowding, security risks, increased costs of inmate management, and leakage of the effectiveness of rehabilitation programmes and the welfare of imprisoned inmates (Esther & Palmen, 2023; Suhakam, 2023). Therefore, implementing strategies that enhance the effectiveness of community corrections can solve the situation in prison and meet inmates' life satisfaction.

Besides, the life satisfaction of inmates appears to be a vital part of achieving the government's aspiration for Malaysia Madani, as they are Malaysian citizens. Indeed, low life satisfaction among inmates stems from a variety of factors, including inefficient treatment programmes (Lee et al., 2021), inequity in the management of communicable diseases (Fazel & Baillargeon,

2011), and insufficient numbers of prison staff (Bahagian Sumber Manusia, 2020). Likewise, inmates also experienced severe anxiety (Lindstedt et al., 2005), isolation while living in custody (Baharudin et al., 2020), and traumatic incidents (Pavot & Diener, 2008). Therefore, focusing on their mental health and social support can help them achieve a higher level of life satisfaction, which is necessary for greater resilience, decreased emotional suffering, and improved adjustment to incarceration (Baharudin et al., 2020a; Leidenfrost et al., 2016).

Prison management is accountable for the life satisfaction of inmates (Ali et al., 2016). Inmates with chronic and persistent behavioural disorders were subject to harsher restrictions to improve their life satisfaction. In contrast, higher levels of life satisfaction are associated with increased resiliency, diminished emotional suffering, and enhanced adaptation to incarceration (Baharudin et al., 2021). Previous studies among South Korean inmates indicated that the prison climate of horticulture therapy improved inmates' life satisfaction (Lee et al., 2021). A study among Chinese drug abusers reveals that social support from family, friends, and significant others strongly correlates with life satisfaction (Cao & Liang, 2020). However, although the relationship between social support and life satisfaction was significant, the research only involved 110 respondents. Despite this, prison climate and social support studies concerning inmates' life satisfaction remain underexplored (Baharudin et al., 2021). Thus, the research attempts to determine the significance of social support and prison climate, which may improve life satisfaction among inmates who go through community corrections.

The greater focus on community corrections is part of Malaysia's objective to reduce the recidivism rate in the country, whose aim is to have two-thirds of eligible inmates undergo community corrections by 2030 (Bernama, 2022). Community corrections are under the Community Rehabilitation Programme initiative for eligible inmates, which aims to expand the concept of restorative justice compared to punitive justice in the Malaysian prison system. The initiative is seen to be increasingly essential in providing a second chance to inmates and in the process of integrating into society.

The evolution of empowering rehabilitation in the community among inmates has been actively implemented, and it will continue to be a consistent direction of the Malaysian Prison Department in the future. The Malaysian Prisons Department started implementing the parole system in 2008, then the Halfway House in 2009, the Compulsory Attendance Order in 2010, the Community Reintegration Programme in 2011, the Early Release 14 Days in 2012, the Corporate Smart Internship Programme in 2016, the Industrial Community Reintegration Programme in 2019, the Release On Licence in 2020, and the Release On Licence for Henry Gurney School in 2021.

This study focused on the inmates who participated in the Community Reintegration Programme (CRP), where rehabilitation activities are carried out. There are six CRPs all over Malaysia, consisting of CRP Kuala Muda, Kedah, CRP Sepang, Selangor, CRP Mantin, Negeri Sembilan, CRP Kuala Kerai, Kelantan, CRP Kluang, Johor, and CRP Tuaran Sabah. CRP covers rehabilitation activities and the integration process of inmates in the community outside the prison walls, such as involvement in community service, working in factories, working in the sectors of plantation and agriculture, and working in the livestock sector, where it is a joint venture between the Malaysian Prison Department and the industry company.

LITERATURE REVIEW

Prison Climate

Additionally, referred to as the prison environment according to Ross et al. (2008), the social environment according to Smith et al. (1997), the institutional environment according to Day et al. (2011), the secure environment according to Schalast et al. (2008), and the climate perception and According to Parker et al. (2003), prison climate is a frequent term. Additionally, Dollard and Bakker (2010), Day et al. (2011), and Lafferty et al. (2016) have

referred to them as prison social capital, social climate, and safety climate. In light of this, the dynamic security model and the prison climate are related. According to the United Nations Office on Drugs and Crime, a dynamic security model combines the population of prisoners, the relationship between inmates and prison officers, and prison activity (Neubacher & Kant, 2023). Simultaneously, the model indicates that prison personnel must maintain their authority and differentiation about inmates to establish successful interactions and reduce isolation (Worthington, 2012).

Social Support

Social support can be defined as the presence or accessibility of individuals we depend on who demonstrate concern, appreciation, and affection towards us (Sarason et al., 1983). It encompasses interpersonal interactions that involve emotional support, practical aid, information sharing, or other forms of assistance (Blagden et al., 2017). The social convoy model, which Kahn and Antonucci proposed in 1980, is a thorough theoretical framework that examines the idea of social support. According to Fuller et al. (2020), the model aims to describe a heuristic structure for the conception and understanding of social relationships. The model has been widely used in prior scholarly investigations, including studies involving older adults (Fuller et al., 2020), youngsters and adolescents (Levitt, 2005), as well as individuals residing in various settings (Perkins et al., 2013). The social convoy model describes social support for the sake of inmates as a function of a network of social connections based on the familiarity and intimacy of interactions (Baharudin et al., 2021).

The social convoy model consists of three concentric circles, which maintain a distinct distance from the individual present (Fuller et al., 2020). First, the inner circle is frequently seen as the recipients' most significant source of support. Second, the individuals in the middle circle, who have a stronger affinity and connection than expected based on their positions, are further apart than those in the inner circle. Third, the outside circle refers to those individuals who are not included in the inmate's inner or middle circle but are nevertheless significant in their lives (Fuller et al., 2020). Inmates establish relationships with and receive social support from the social milieu. These people, such as family members, friends, and others, play specific roles. In this role, inmates experience events as part of a group or convoy. Negatively or positively, encounters in the convoy setting might improve their understanding of each event's dynamics. This study uses the social convoy model as a theoretical lens to explain the appropriateness of inmates' social support for their life satisfaction.

A review of relevant literature indicates an increased awareness of the impact of the prison climate on social support. Scholars of prison studies have conducted several studies on the relationship between prison climate and social support (Andersen, 2018; Lambert et al., 2016; Mowen et al., 2020). A previous study among female drug-abuse inmates shows that the relationship between prison climate activities and perceived social support is essential for inmates' success in the future (Andersen, 2018). Based on several studies that extensively examined the relationship between prison climate and social support, the current study proposes the following hypothesis:

H1: The prison climate has a direct effect on social support.

Life Satisfaction

Life satisfaction is a cognitive evaluation of an individual's quality of life and an integral component of subjective well-being (Diener et al., 1985). Life satisfaction is depicted as having long-term functioning associated with an individual's behaviours, moods, and emotions in life domains such as job satisfaction, marital status, and finances (Pavot & Diener, 2008). Life satisfaction is frequently temporary until individuals adjust to their new life domain due to transition (Diener et al., 2013).

According to Dunn et al. (2013), life satisfaction relates to the individual's evaluation process based on the individual's particular criteria (Diener et al., 1999). It is a consistent component of an individual's life, as Kevin (2006) stated, that connects with their perception of life (Kaku, 2010). Life satisfaction is essential for inmates to explain their perceptions of prison life in a prison setting. Also, gaining life satisfaction is necessary for inmates to achieve their highest prison function (Kashy & Morash, 2021). Improving life satisfaction is also critical for successfully reintegrating released inmates into their communities (Ali et al., 2016). Likewise, life satisfaction can be a benchmark and guidance for relevant parties, such as the government and prison management, to develop more effective rehabilitation programmes and minimise recidivism (Ali et al., 2016; Leidenfrost et al., 2016).

Festinger developed the social comparison theory in 1954, which relates to life satisfaction (Ruggieri et al., 2020). The theory examines the psychological mechanisms by which people compare themselves to others. It is suggested that individuals have a drive to achieve particular self-assessments by comparing their thoughts and abilities to those of others to measure themselves (Myers, 2010). In this context, if inmates compared themselves to better inmates, they would likely feel insecure, reflecting their daily lives. Otherwise, if inmates compare themselves to people who are less like them, this is an example of social comparison at the individual level (Olivos et al., 2020; Ruggieri et al., 2020).

A study on the impact of prison climate on life satisfaction has received increasing attention (Ali et al., 2016; Lee et al., 2021; Van Ginneken et al., 2019). A study in a Dutch prison indicated a relationship between prison climate and inmates' life satisfaction (van Ginneken et al., 2019). The study's findings reveal that inmates with low psychological distress in the prison climate experienced positive levels of life satisfaction. Previous scholars also stated that prison climate influenced inmates' life satisfaction (Ali et al., 2016). Based on earlier studies' findings, it is hypothesised that prison climate directly affects drug-abuse inmates' life satisfaction. The hypothesis for this study, therefore, is formulated as follows:

H2: The prison climate has a direct effect on life satisfaction.

Numerous researchers have examined the connection between social support and life satisfaction, and they have found that social support results from life satisfaction (Cao & Liang, 2020; Heng et al., 2020; Ma, 2020; Yang et al., 2020). For example, a study among Hong Kong high school students identified a strong association between social support from family and friends and life satisfaction (Ma, 2020). Furthermore, they revealed that Chinese and ethnic minority groups demonstrated a significant relationship between social support from family and friends and life satisfaction. This current study concluded that the relationship between social support and life satisfaction was clear based on previous literature. Hence, the hypothesis for the relationship is as follows:

H3: Social support has a direct effect on life satisfaction.

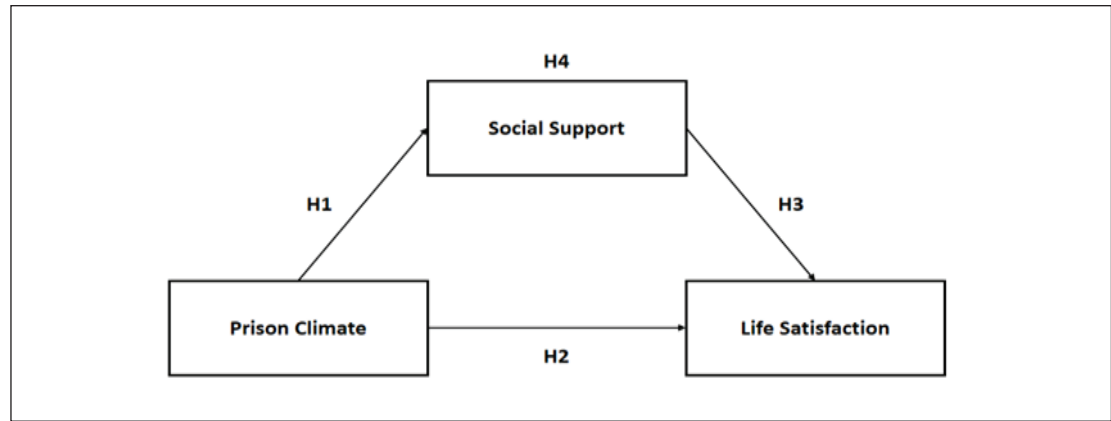
In recent years, a study examining social support as a mediator has become the focus of researchers in various disciplines (Li et al., 2018; Lin et al., 2020; Rahmat et al., 2019; Skowronski & Talik, 2020). The role of the social support variable as a mediator between several independent variables and the dependent variable of the life satisfaction construct is very important. Thus, the hypothesis for the mediating role of social support in this study is as follows:

H4: Social support mediates the relationship between prison climate and life satisfaction.

Consequently, the relations between the constructs in the form can be linked to a more general conceptual model, as shown in Figure 1.

Figure 1

Framework of the Study



METHODOLOGY

A cross-sectional research design was applied in this study, which targeted Malaysian inmates who participated in the Community Reintegration Program. The selection of the target population in this study was based on several specific criteria. The sampling frame was obtained from the Malaysian Prison Department (PRIDE) based on a list of 886 inmates from the middle zone of CRP, consisting of CRP Sepang, Selangor, and CRP Mantin, Negeri Sembilan, by applying simple random sampling. This study uses the table of sample sizes developed by Cohen et al. (2007) to determine the sample size of the given population. Therefore, the calculation was made using the calculator at the following web link: <https://www.surveysystem.com/sscalc.htm> to determine the sample size of this study. Based on the calculation, the sample size for this study was 380 respondents for a population of 886, in which the confidence level was 99% and the margin of error was 5% (L. Cohen et al., 2007). Table 1 illustrates the calculation of the sample size for each related prison. Based on Table 1, the sampling size for each prison was chosen based on 42.9% of the total required sampling size from the population size ($380 \div 886 \times 100 = 42.9\%$).

Table 1

Population and Sampling Size of Prisons

No	Institution	Population	Sampling calculation	Sampling size
1	CRP Sepang, Selangor	488	$42.9\% \times 488$	209
2	CRP Mantin, Negeri Sembilan	398	$42.9\% \times 398$	171
	Total	886		380

The statistical analyses were performed to illustrate the model and test procedures using the structural equation modelling (SEM) method of IBM-SPSS-AMOS 24 for the essence of social support among inmates. The measurements for this quantitative study were adapted from previous studies. Prison climate was measured by the scale of inmates' surveys (Molleman & van der Broek, 2014), while social support and life satisfaction were measured by the Multidimensional Scale of Perceived Social Support by Dahlem et al. (1991) and the Satisfaction with Life Scale (Diener et al., 1985). This study uses the prison climate concept by Ross et al. (2008). This concept defines prison climate as how inmates and prison officers see the environment in terms of organisational, social, physical, and emotional aspects. For life satisfaction, this study used the definition by Oishi et al. (2018), which says that it is a person's evaluation of his or her life based on criteria or factors that the person thinks are important. For social support, the study used the definition by Feldman (2019), which says it is mutual help, concern, and support from one person to another.

Validation Procedures

Exogenous, endogenous, and mediator constructs make up the study's structure. The three latent constructs in the study are social support, life satisfaction, and prison climate. Life satisfaction is a first-order construct, while prison climate and social support are second-order constructs. Particularly, the three components of expectation for the future, reintegration, and activity comprise the exogenous construct known as prison climate. The components of friends, family, and others (prison officers) make up the mediator construct of social support, whereas the endogenous construct of life satisfaction is assessed using four items.

Before the SEM was conducted, the validity of the measurement model (convergent validity, construct validity, and discriminant validity) and composite reliability were examined using confirmatory factor analysis (CFA) (Awang et al., 2018). SEM is also helpful for evaluating the study's hypotheses, calculating the correlations between all dimensions, and determining the function of social support as a mediator of the relationship between prison climate and life satisfaction. The measurement model has achieved the necessary fitness indices. Figure 2 shows the measurement model that has the required fitness indexes (ChiSq/df = 2.195, TLI = 0.959, CFI = 0.965, and RMSEA = 0.057=6) and construct validity (Awang, 2015; Awang et al., 2018).

Figure 2

Pooled CFA Result

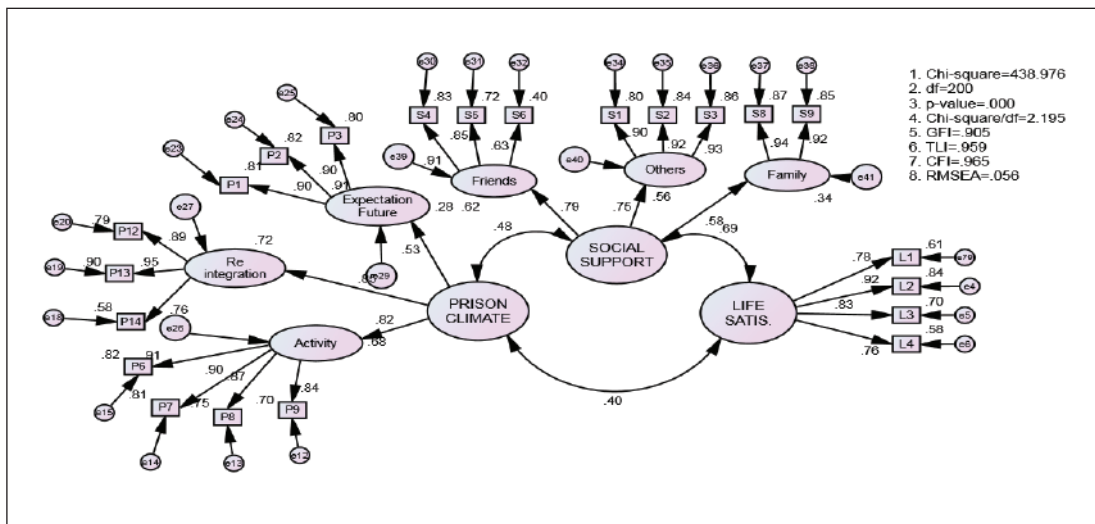


Table 2 illustrates the factor loading, the composite reliability (CR), and the average variance extracted (AVE) for prison climate, social support, and life satisfaction. The results indicate that the prison climate construct, consisting of three components—expectation for the future, reintegration, and activity—achieved the levels of CV and CR. Likewise, the social support construct with three components of friends, family, and others and the life satisfaction construct with four items of L1, L2, L3, and L4 achieved CV and CR levels. The results proved that the factor loading for prison climate, social support components, and life satisfaction items is higher than 0.60, which achieved the analysis requirement.

Table 1*The CR and AVE Values of Prison Climate, Social Support, and Life Satisfaction*

Construct	Component	Factor Loading	CR	AVE
Prison Climate	Expectation for future	0.636	0.796	0.574
	Reintegration	0.830		
	Activity	0.864		
Social Support	Friends	0.820	0.760	0.518
	Family	0.605		
	Others	0.724		
Life Satisfaction	L1	0.786	0.896	0.683
	L2	0.897		
	L3	0.845		
	L4	0.773		

Table 3 shows that a construct's discriminant validity is reached when the square root of its AVE is equal to its correlation value with other constructs in the model (Awang et al., 2018). In those statements, discriminant validity is attained when the diagonal values (in bold) are more significant than all of the other values in the row and column. Likewise, Table 3 illustrates the tabulated values that comply with the discriminant validity threshold. The analysis, therefore, demonstrates that discriminant validity is obtained for all constructs. Besides that, the present study's normality assessment was provided by looking at each item's skewness and kurtosis values. The required level between -2.58 and 2.5 is reached since the skewness estimate ranges in this study are between -1.29 and 0.475, while kurtosis ranges between -1.12 and 1.136 (Hair et al., 2014). It is demonstrated that the data in this study are normally distributed.

Table 3*Summary of the Discriminant Validity Index for All Construct*

Constructs	Prison Climate	Social Support	Life Satisfaction
Prison Climate	0.76		
Social Support	0.52	0.72	
Life Satisfaction	0.42	0.68	0.83

RESULTS

The SEM method evaluates the study hypothesis using AMOS version 24. The SEM has corresponding points of interest to assess the ties represented by indicator variables between latent constructs. In addition, correlations between measurement errors can also be considered, and the recursive relationship between constructs can be calculated. Table 4 shows the information that was gathered from using the SEM technique. As a result, it was found that the prison climate directly affects social support. Thus, H1 is supported. However, the direct effect of the prison climate on life satisfaction was found to be insignificant. Thus, H2 is not supported. Meanwhile, it was shown that social support directly affects life satisfaction. Therefore, H3 is supported.

Table 4

Regression Path Coefficient and Its Significance

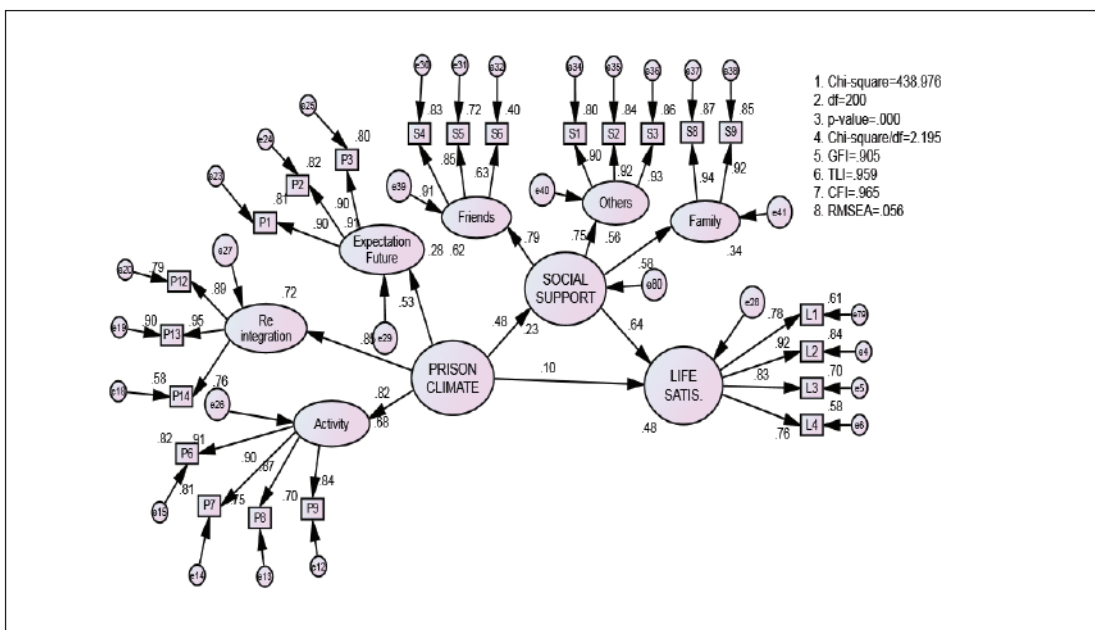
Construct	Path	Construct	Beta Estimate	Standard Error	Critical Region	P-Value	Result
Social Support	<---	Prison climate	0.48	0.06	8.018	***	Significant
Life satisfaction	<---	Prison climate	0.087	0.052	1.497	0.135	Not Significant
Life satisfaction	<---	Social Support	0.684	0.077	8.931	***	Significant

Note: Significant level *** p<0.001

Figure 3 shows that the model's parts of prison climate and social support can predict the life satisfaction of 48% of inmates.

Figure 3

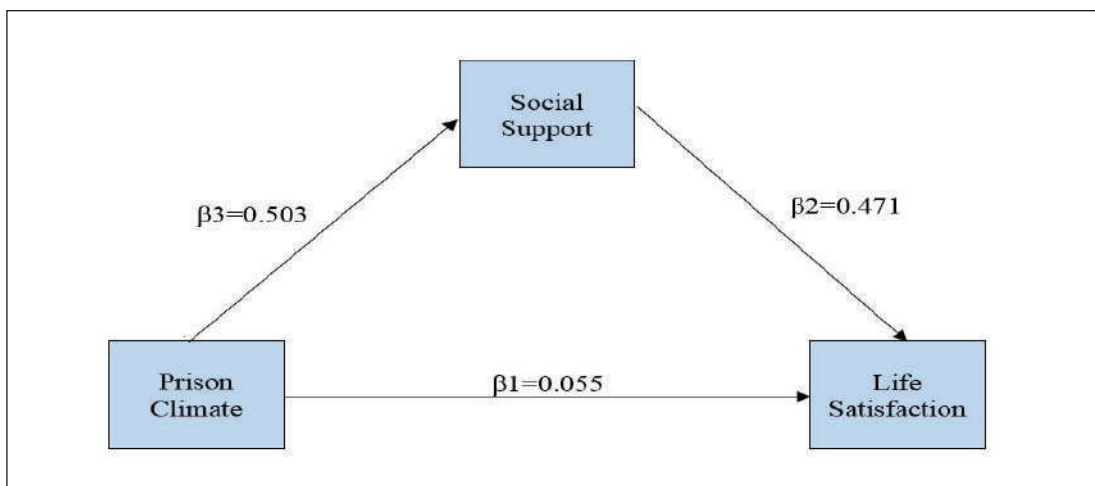
Standardised Regression Path Coefficient



The current study used the traditional procedure to analyse social support's mediating effect between prison climate and life satisfaction to test the hypothesis's mediator impact, as shown in Figure 4.

Figure 4

Analyse the Mediating Effects of Social Support



The regression coefficient β_1 (prison climate to life satisfaction) is not significant, although the other two hypotheses testing for regression coefficients β_3 (prison climate to social support) and β_2 (social support to life satisfaction) are significant. Awang et al. (2018) suggest that the result proves that social support is a full mediator, as explained in Table 5. Thus, H4 is supported.

Table 5

The Full Mediator of Social Support Analysis

Construct	Path	Construct	Estimate	S.E.	C.R.	P-Value	Result
Life Satisfaction	<---	Prison Climate	0.055	0.054	1.030	0.303	Not Significant
Life Satisfaction	<---	Social Support	0.471	0.090	5.255	***	Significant
Social Support	<---	Prison Climate	0.503	0.060	8.324	***	Significant
Conclusion	<p>1. Both hypotheses testing for regression coefficient β_3 (Prison Climate to Social Support) and β_2 (Social Support to Life Satisfaction) are significant</p> <p>2. Hypothesis testing for regression coefficient β_1 is not significant. Thus, the type of mediation is full mediation</p>						

Bootstrapping was applied to confirm the role of social support in mediating the relationship between prison climate and life satisfaction to prove the result of the mediation analysis in Table 5. This study applied the bootstrapping method of Preacher and Hayes (2008). The results report that the indirect effects of a 95% Boot Confidence Interval (CI) of [LB = 0.283, UB = 0.466] did not include zero (both the upper and lower bounds are in a positive region), as shown in Table 6. Similarly, it is proven that the mediator type is a full mediator because the effects of the direct effect were not relevant, with a p-value of 0.41. Thus, social support fully mediates the relationship between prison climate and life satisfaction.

Table 6

The Full Mediator of Social Support Analysis by Bootstrapping

Mediator	Prison Climate → Social Support → Life Satisfaction		Two-tailed significant	Result
	Lower Bound (LB)	Upper Bound (UP)		
Direct effect on Life Satisfaction	-0.064	0.168	0.41	Not Significant
Indirect effect on Life Satisfaction	0.283	0.466	0.001	Significant
Type of mediation	Fully mediation occurred since the direct effect is not significant			

DISCUSSION

Imprisonment affected inmates' life satisfaction because of the consequences derived from overcrowding. Therefore, prison climate is not related to fulfilling inmates' life satisfaction. Besides, many researchers have stressed that the essence of social support is the mediator in numerous studies (Li et al., 2018; Lin et al., 2020; Rahmat et al., 2019; Skowronski & Talik, 2020). A current study also identifies that social support mediates the relationship between prison climate and life satisfaction among inmates of the Community Reintegration Programme of community erections. More specifically, the form of mediation that had the greatest effects was the full mediation of social support on the relationship between prison climate and life satisfaction.

Conversely, the presence of social support as a mediator makes the relationship meaningful. Social support is essential for inmates to achieve life satisfaction while undergoing community corrections. A current study reveals that life satisfaction declines when inmates meet a low prison climate level, which can be improved through social support that keeps inmates motivated even in unfavourable situations. However, it has also been shown that the prison climate has not positively affected life satisfaction. Overall, a study reveals that social support mediates the association between prison climate and life satisfaction.

CONCLUSION AND RECOMMENDATIONS

This study aims to determine the role of social support in mediating the relationship between prison climate and life satisfaction among Malaysian inmates in community corrections in CRP. The study discovered that social support is critical in the relationships mentioned above. Findings suggested that inmates who gained positive social support were satisfied with their lives. The present study also showed an insignificant relationship between prison climate and life satisfaction that can be improved by providing proper social support to the inmates to fulfil their life satisfaction. Hence, the study's findings confirmed that social support plays a vital role as a mediator in the relationship between prison climate and life satisfaction.

The Malaysian Prison Department should improve social support and prison climate, which may drive inmates to live in prison to fulfil their life satisfaction. The study's findings contributed to the theoretical and contextual contributions that benefited the Malaysian Prison Department in the sustainable management of inmates. Applying the model of the study leads to superior intelligence and successful decision-making in responding to inmates' needs and ensuring a good environment in community corrections, which are related to their prison climate, social support, and life satisfaction. This study also contributes to the importance of social support, highlighted as one of the critical psychosocial factors that linked prison climate and inmates' life satisfaction. The prison authority could stimulate and sustain the prison climate by planning, designing, and developing related strategies such as upgrading accommodations, enhancing networking with the community, and strengthening inmates' intrapersonal skills within related activities. Apart from this, prison management needs to improve inmates' social support from friends, family, and prison officers to fulfil inmates' life satisfaction.

LIMITATION

A recent study's drawbacks are that it emphasises life satisfaction among Malaysian inmates, even though it also impacts other prison settings, such as prison officers and foreign inmates. The surveys were also spread across Peninsular Malaysia to selected respondents, especially in the middle zone, neither in other zones nor in Sabah and Sarawak, whose demographics vary and do not represent Malaysia as a whole. In addition, the quantitative method was utilised in this study despite the mixed-mode and qualitative methods being practical for measuring inmates' life satisfaction. Therefore, for more conclusive results, the next study should incorporate the current study's findings.

SUGGESTIONS

Future studies should employ the same model in other residential facilities, such as juvenile centres, women's, and drug-related prisons. The outcome may differ because of the uniqueness of the climate compared to the current study. It is suggested that future research employ mixed-mode or qualitative methods for measuring the life satisfaction of incarcerated individuals, which will enhance the originality of the findings. In addition, future researchers are encouraged to utilise other dependent constructs, such as personality, resiliency, and motivation, because they are advantageous and might be associated with social support and life satisfaction. Consequently, for more conclusive results, the next study should incorporate the recommendations of this study.

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FIGHTING AGAINST ILLEGAL TRADING OF PERSONAL DATA: AN UPHILL BATTLE FOR VIETNAM?

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ABSTRACT

The unauthorized trading of personal data has emerged as a global concern, with far-reaching implications for individual privacy, cybersecurity, and societal trust. Vietnam, a rapidly developing nation, confronts a multifaceted dilemma in addressing illegal data trading. In this paper, the authors delve into the intricate landscape of combating illegal personal data trading, focusing on the unique challenges faced by Vietnam. We explain the legal frameworks governing personal data protection in Vietnam, examining their adequacy and enforcement efficacy. We also scrutinize the intricate interplay between technology, data privacy, and cybersecurity in the Vietnamese context. Furthermore, we consider the cultural and socio-economic factors that contribute to the persistence of illegal data trading practices. Ultimately, we offer a nuanced understanding of the obstacles facing the country and propose a roadmap for crafting holistic solutions that safeguard personal data in Vietnam.

VIETNAMESE LEGAL FRAMEWORK ON PERSONAL DATA PROTECTION

The Evolution of Vietnamese Laws on Personal Data Protection

The Constitution

Since the first Constitution promulgated in 1946, the modern Vietnamese law has always enshrined fundamental rights such as “the right to life, liberty, and the pursuit of happiness”. However, due to the wartime, the 1946 Constitution merely delineated these civil rights at a rudimentary level without expansive applications across various domains. Notwithstanding this limitation, the 1946 Constitution did contain a specific provision (Article 11) pertaining to privacy rights concerning correspondence.

Subsequent 1959 and 1980 Constitutions expanded the scope of these rights but retained inherent limitations. Specifically, Article 71 of the 1980 Constitution incorporated additional categories – “telephone and telegraph” – while ambiguously stating that “The secrecy of correspondence, telephones, and telegrams are guaranteed” without explaining what this assurance entailed.

In the 1992 Constitution, Article 73 more explicitly stipulated that “The safety and confidentiality of citizens’ correspondence, telephones, and telegrams are ensured”. Nevertheless, this provision did not delineate who is responsible for ensuring this safety and confidentiality.

Subsequently, the current 2013 Constitution clarified and perfected several provisions from the 1992 Constitution, introducing for the first time the term “personal privacy”. Article 21 of the 2013 Constitution widened the protective scope, stating that “Everyone has the right to inviolability of private life, personal privacy, and family secrecy; the right to protect one’s honor and reputation. Information regarding private life, personal privacy, and family secrecy is legally ensured for safety”. This provision introduced and provided the constitutional basis for the term “personal privacy”.

The Civil Code

Although the 2013 Constitution was the first Constitution to recognize the term “personal privacy”, the Vietnamese Civil Codes had already referenced privacy rights. The first iteration of the 1995 Civil Code outlined the rights to personal secrecy (Article 34), followed by subsequent versions in 2005 (Article 38) and 2015 (Article 38). An evident distinction between the 1995 and 2005 versions pertains to the title of the provision. While the 1995 version used the term “rights with respect to personal secrecy”, the 2005 version omitted the phrase “with respect to”, thereby emphasizing it as a distinct right within civil law, rather than a generic term subsuming various rights. Both versions generally stipulated that the right to personal secrecy is “respected and legally protected”. Nevertheless, Article 38 of the 2005 Civil Code modified the subjects who could consent to the collection and publication of personal information, extending this privilege to legally designated representatives beyond immediate family members.

Hence, the inviolability of individual privacy, personal secrecy, and familial confidentiality aligned with the 2013 Constitution. This provision delineated more explicitly its scope of protection, which now includes “private life, personal secrecy, and family secrecy”. Nevertheless, due to the absence of precise definitions for these terms, ambiguities persist in identifying the exact scope of safeguard under the law. Furthermore, this provision covered further activities such as the “collection, storage, use, and public disclosure of information”, which was a significant expansion compared to previous 1995 and 2005 versions.

Specific Laws (*lex specialis*)

Specific laws also incorporated rights and responsibilities pertaining to personal information. Noteworthy, the 2005 Pharmaceutical Law introduced the term “personal information”, albeit without a comprehensive definition. Furthermore, the 2006 Information Technology Law included specific provisions on the collection, processing, and use of personal information in online environments, as well as storage and provision of personal information on the internet; however, it too lacked a definitive explanation of “personal information”.

The Decree No. 64/2007/ND-CP on the Application of Information Technology in the State Agencies’ Activities was the first regulation to offer a general concept of personal information, defining it as “information sufficient to accurately identify an individual”. Later, the Decree No. 52/2013/ND-CP on E-commerce offered another perspective, defining it as information that helps to identify an individual and other information that the individual wishes to keep confidential. Personal information does not include work contact information and information that individuals have self-published in the media. Nevertheless, Decree No. 72/2013/ND-CP on the Management, Provision and Use of Internet Services and Online Information took an opposite approach, defining it as “information associated with the identification of individuals”, regardless of whether this information has been published (Chu, 2022).

Despite multiple enactments between 2005 and 2015, a consistent application of terminology remains elusive. This inconsistency results in contradictions when applying the laws and regulations.

In short, a constitutional foundation for personal privacy was not established until the enactment of the 2013 Constitution. Prior to this milestone, various laws and regulations had already safeguarded some aspects of personal information. However, these documents have manifested overlaps and inconsistencies in their legal stipulations, further compounded by a lack of uniformity in the definition of related terminologies, which consequently leads to ambiguities in their application. After the enactment of the 2013 Constitution, legal documents have indeed undergone modifications to align with constitutional mandates

The Current Legal Framework on Personal Data Protection

General Laws (*lex generalis*)

Originating from the 2013 Constitution, Vietnamese legislation has made references to personal privacy. The 2015 Civil Code improved relevant provisions by utilizing a more nuanced terminology “private life, personal secrecy, and family secrecy”. Additionally, Article 38(4) of the 2015 Civil Code has introduced regulations safeguarding private life, personal secrecy, and family secrecy within contractual relationships. However, the 2015 Civil Code still lacks a precise definition of what these categories of information entail.

The 2015 Law on Network Information Security, although not employing the same terminology as the 2015 Civil Code, defined “personal information” as “information associated with identifying a specific individual”. It further introduces the term “subject of personal information” as “an individual identified through that personal information”. Moreover, the 2015 Law on Network Information Security explicated “personal information processing” as “performing one or multiple operations of collecting, editing, using, storing, providing, sharing, and disseminating personal information online for commercial purposes”. Therefore, activities such as “collection, storage, usage, and public disclosure” as regulated in the Civil Code are indeed forms of personal information processing. Although the 2015 Law on Network Information Security offers more detailed provisions than the 2015 Civil Code, the former leaves unresolved issues concerning non-commercial personal data processing for other legal documents to cover.

Similarly, within the cyber realm, the 2018 Law on Cybersecurity stipulates measures for ensuring societal security online and outlines responsibilities for relevant agencies, organizations, and individuals. The 2018 Law on Cybersecurity was the first legislation to require online service providers to notify users in the event or potential occurrence of incidents involving leaks, losses, or damages to user data (Article 41(1)(c)). However, its provisions on user information security are only fundamentally principled in nature.

Specific Laws (*lex specialis*)

Nonetheless, existing laws still possess substantial gaps in the realm of personal data protection. Regarding vulnerable persons such as children, persons with disabilities, and the elderly, the 2010 Law on Elderly Persons lacked explicit regulations pertaining to the protection of personal information for the elderly. Nevertheless, the 2010 Law on Persons with Disabilities unambiguously prohibited the exploitation of the images, personal information, and condition of disabled individuals for profit or for the execution of unlawful acts (Article 14(4)).

The 2016 Law on Child Protection marked a substantial advancement from its 2004 version. The 2016 Law on Child Protection law explicitly prohibited the disclosure of private life, personal secrecy about the child without the consent of the child, if above seven years of age, and their legal guardians (Article 6(11)). It further includes a provision devoted to preserving the children’s right to privacy, safeguarding them against illegal intrusion into their private information (Article 21). Additional regulations extend to service providers who must maintain confidentiality in cases involving victimized children. Building on these provisions, the 2018 Law on Cybersecurity includes specific regulations for child protection in cyberspace (Article 29).

Another significant stakeholder group – consumers – receives special attention. The 2023 Law on Consumer Protection introduced and elaborated the concept of “consumer information”, including personal information, transactional records, and other data relevant to consumer transactions (Article 3(3)). Consequently, the number of provisions related to consumer information in the 2023 version has increased sixfold compared to the 2010 version, featuring notable requirements like explicit written agreements for situations where businesses delegate or contract third parties to manage consumer information.

The 2023 Decree on Personal Data Protection

While the existing laws to some extent address principles and regulations concerning the protection of personal data, it is only with the advent of the Decree No. 13/2023/ND-CP on Personal Data Protection that the act of trading personal data is expressly prohibited (Article 3(4)). However, since this decree is a regulation, its applicability is subordinate to legislations, implying that laws must be applied in cases involving personal data protection before referring to this Decree. Given that the Decree has only recently become effective as of 1 July 2023, a comprehensive evaluation of its impact on the protection of personal data in Vietnam remains to be conducted.

The Decree No. 13/2023/ND-CP significantly contributed to providing a more comprehensive legal framework for the protection of personal data. Unlike the term “personal information”, which had sporadically appeared in previous legal documents, the term “personal data” was officially defined for the first time in this Decree. According to Article 2(1) of the Decree No. 13/2023/ND-CP, “Personal data is information in the form of signs, writing, numbers, images, sounds, or similar forms in the electronic environment that are associated with a specific individual or facilitate the identification of a specific individual. Personal data encompasses both basic and sensitive personal data.”

Legal Remedies

The regulatory frameworks governing the violations pertaining to the buying and selling of personal information are tripartite: civil, administrative, and criminal responsibilities.

Civil responsibilities primarily focus on contractual penalties and compensatory damages, encompassing both contractual and extra-contractual damages. However, such compensations are only permitted if the damages are indeed actualized.

Administrative sanctions for violations related to personal information are dispersed across various legal documents. Noteworthy, the Decree No. 15/2020/ND-CP stipulated two main offenses: (1) Violating regulations concerning the collection and utilization of personal information and (2) Violating regulations concerning the storage, rental, transmission, provision, access, collection, processing, and utilization of information. Penalties range from VND 40,000,000 to VND 60,000,000 for the first offense, and from VND 50,000,000 to VND 70,000,000 for the second, along with additional punitive measures such as license revocation and confiscation of illegal profits.

Additionally, the Decree No. 98/2020/ND-CP stipulated penalties ranging from VND 30,000,000 to VND 40,000,000 for the illegal transfer or sale of consumer-related personal information in e-commerce. Additional penalties include the seizure of objects or tools used in the offense or the suspension of e-commerce activities for six to 12 months. Remedial measures include domain name retrieval and app removal, among others.

The 2015 Criminal Code (as amended) does not directly address dangerous activities that infringe upon personal data but includes articles on “the crime of violating the privacy or security of letters, telephones, telegrams, or other forms of private information exchange” (Article 159) and “the crime of unauthorized distribution or utilization of computer network or telecommunications information” (Article 288). Penalties for these crimes are stratified according to the degree of the offense and can range from VND 30,000,000 to VND 1,000,000,000, along with imprisonment of varying durations.

In summary, the existing sanctions for violating laws concerning the buying and selling of personal data suffer from overlapping and inconsistent terminologies across various legislative documents. These inconsistencies have impeded effective enforcement, particularly when certain offenses related to personal data fall outside the purview of specialized legal documents. Moreover, current regulations largely focus on electronic forms of personal data, neglecting non-electronic forms such as paper lists and identification cards.

Prevalence of Personal Data Breaches in Vietnam

According to DataReportal, as of January 2023, Vietnam had 77.93 million Internet users, constituting approximately 79.1% of the population. This report highlights that Vietnamese people spend an average of 6 hours and 23 minutes per day browsing the Internet, with 55.4% of that time spent on mobile devices. At the time of this statistical review, Vietnam had 70 million social media users, and the five most prevalently utilized platforms were Facebook (91.6%), Zalo (90.1%), TikTok (77.5%), Facebook Messenger (77%), and Instagram (55.4%) (DataReportal, 2023).

These statistics indicate a substantial volume of personal electronic data in Vietnam, where most Internet and social media users provide personal information to access these services. Owing to the nature of digital data, this information is susceptible to unauthorized collection, storage, and dissemination. With just a few digital actions, files containing personal information can be globally circulated and replicated, leading to their illicit trading.

In recent years, Vietnam has witnessed an alarming surge in significant data breaches involving major corporations. For instance, in 2016, cyber-attacks against Vietnam Airlines led to the exposure of 411,000 customer accounts (Nam, 2016). Similarly, in 2018, companies like The Gioi Di Dong and Dien May Xanh compromised over 5 million emails and numerous payment card details, while FPT had its customer data publicly disclosed (Mai, 2018). Facebook further exposed information on 50 million Vietnamese users in 2019 (Khoa, 2019). Additionally, in 2022, Viettel Cyber Security recorded 34 significant data breaches, four of which were in the technology and business sectors, compromising approximately 2TB of data and five million records (Viettel Cyber Security, 2022). During the first quarter of 2023, Viettel Cyber Security documented ten major data breaches, including the sale of around 300GB of source code and customer data (Khanh, 2023).

A 2022 survey conducted by the Vietnam Information Security Association (VNISA) involving 135 Vietnamese enterprises and organizations found that 42.2% expressed concerns about information security threats and 68% reported inadequate financial resources to meet annual security requirements (VNISA, 2022). Fortinet discovered approximately nine million threats per day in Vietnam in the first quarter of 2023. These primarily consisted of exploratory attacks aimed at identifying vulnerabilities in both enterprise and personal systems. Concurrently, 72% of the survey respondents reported experiencing at least twice the number of security incidents in the recent past, underscoring the inadequacy of existing corporate security measures. Furthermore, public awareness regarding general information security, and specifically personal data protection, remains markedly deficient. The Authority of Information Security under the Ministry of Information and Communications assessed that 80% of personal data breaches are due to user negligence, whereas only 20% are the fault of platforms holding the data (NK, 2022).

The Ministry of Public Security identified over 60 entities involved in the illegal sale and utilization of personal data online, spanning multiple sectors. Such data is repeatedly bought and sold, sometimes with guarantees of accuracy and updates, across various domains like public administration, banking, insurance, and more. Personal data trading occurs predominantly in two ways: businesses collecting personal data allow third parties to access this information without stringent regulations, facilitating further illicit data trading; or companies actively collect, analyze, and sell this data as part of their business operations (Ministry of Public Security, 2019).

The Cybersecurity and High-Tech Crime Prevention and Control Department indicated that illegal data trading is not merely an isolated act between individuals but involves corporations and organizations. These entities invest in developing technologies for the unauthorized collection of personal data and deploy malicious code to extract such data from networked environments. The Ministry of Public Security reported that between 2019

and 2020, hundreds of individuals and organizations were implicated in the illicit trade of personal data, totaling nearly 1,300GB of stolen information (Du, 2022).

In Vietnam, the illicit trade of personal data has become so blatant that merely typing “buy data” into Google instantly yields a multitude of posts soliciting or offering such data for sale. This phenomenon primarily manifests on social media platforms like Facebook and Telegram, where groups containing thousands of participants openly engage in these transactions. In addition to public listings, unauthorized sellers often deploy automated chatbots that offer personal information for as little as \$0.001 to \$1 USD, with Facebook account information typically being the cheapest (Chi, 2023). Cybersecurity experts argue that the low cost of data can be attributed to the ease with which it is acquired through various methods, including the creation of counterfeit fan pages that post lucrative gift offers to attract thousands of comments containing any information the page requests (VLLF, 2022).

Further complicating matters, non-digital personal information of employees is frequently collected without these workers realizing that their rights are being violated. In the early 2023, the Ministry of Justice documented a sudden increase in citizens requesting judicial *curricula vitae*, which are legal documents that indicate whether an individual has a criminal record. These records, especially the highly sensitive Type 2 forms containing information about family relations and marital status, are legally intended for judicial proceedings. The surge in requests for these documents is driven by businesses requiring applicants to submit them as part of their job applications. Most workers being asked to include these records are engaged in manual jobs, including delivery drivers, domestic helpers, and handymen, who are not legally required to produce such documents. Furthermore, their lack of legal knowledge means they comply without understanding the sensitive nature of the personal data they are exposing, and how its leakage could adversely affect their legal rights and interests.

The sharing of sensitive personal information poses a particular risk as, once acquired by hackers or criminals, it is often utilized to perpetrate various types of fraud. These may include impersonating law enforcement or legal officials, posing as bank employees, or other authoritative figures in schemes to illicitly acquire assets. Statistics from the Authority of Information Security under the Ministry of Information and Communications indicate that online fraud incidents in Vietnam increased by 64.78% in the first half of 2023 compared to the same period in the previous year, and by 37.82% compared to the last six months of 2022 (VNS, 2023). These incidents serve as harbingers, accentuating the urgent need for a robust legal framework to curb the commodification of personal data.

Lack of Legal Remedies

Current legislation is either lacking or inadequately punitive, thereby failing to act as a deterrent.

Administrative Responsibilities

Under regulatory guidelines, administrative penalties for data breaches are predominantly applicable to sectors like telecommunications, information technology, and commerce. In many instances, such regulations are impractical for transgressions outside these designated domains. In practical terms, administrative penalties in data protection currently exist but are not universally applicable.

Civil Responsibilities

The issue of liability for compensatory damages in cases of data breaches is yet to be clearly defined in Vietnam. As of now, there is no documented instance where consumers or students have successfully filed lawsuits for compensation against the offending organizations. For example, a 2020 appellate case in the People’s Court of Hai Phong City involved a customer suing a bank for leaking personal transaction information. Despite the plaintiff identifying a bank employee as responsible for the data leak, the lack of sufficient evidence led to the court exonerating the bank. This underscores not only the absence

of comprehensive regulations but also the difficulty in producing evidence to establish liability in cases of personal data breaches.

Criminal Responsibilities

From 2021 through the present day, the pervasive commercialization of personal data over the internet has escalated. However, according to statistics from the Department of Cybersecurity and High-Tech Crime Prevention and Control under the Ministry of Public Security, the number of cases brought to trial concerning personal data trading remains exceedingly limited. Specifically, between early 2021 and February 2023, only five cases have been prosecuted, even as the total data illicitly traded amasses to several thousand gigabytes comprising billions of individual records (Khanh, 2023). These cases were largely initiated to investigate the criminal offense of unauthorized computer or telecommunication network data exploitation, pursuant to Article 288 of the 2015 Criminal Code (as amended). Among the ongoing and adjudicated cases of personal data trading, two prominent ones must be highlighted: (1) A case involving a married couple who illicitly sold millions of customer records from local electric companies, and (2) a case implicating a group illegally trading thousands of details related to phone numbers from three telecommunications providers – Vinaphone, Viettel, and MobiFone.

In the first case, adjudicated in August 2022 under the criminal offense specified in Article 288 of the 2015 Criminal Code (as amended), supplementary investigation was necessitated as the court found the initial case files inadequate in clarifying lawful data managers. The husband, an independent programmer for a telecommunications and information technology company, exploited his privileged access to the database, containing customer information from electric companies. Subsequently, the couple established a software company and illicitly marketed the stolen data online, negotiating prices between 200 and 1,000 VND per data entry (SGT, 2021).

The second case, tried in March 2023, involved eight defendants. Among them was defendant A, Deputy Head of the Cybersecurity Center under VNPT Net, and defendant Q1, a former criminal police officer. Given their professional background in private detective services, defendants T1, T2, and H required information and therefore sought to procure such data. After establishing connections, fraudulent documents were created by Q1 to collect data from Viettel and Mobifone, which was then sold to defendant A and subsequently to other defendants at a price ranging between 500,000 and 1 million VND per data entry. The initial verdict imposed varying sentences on all defendants under Article 288 of the 2015 Criminal Code (as amended), including suspended sentences for some (Thu, 2023).

The accused in both cases were generally charged with the unauthorized exploitation of computer or telecommunication network data, yet the alarming aspect lies in their professional backgrounds. Defendants Q and A possess considerable expertise in information technology, with the latter even working in a cybersecurity center. These individuals, who should ostensibly be well-versed in personal data security, are in fact the violators. This illustrates a significant shortfall in data protection awareness among not just industry professionals but the general populace, exacerbated by the lucrative nature of data trading. Furthermore, in the second case, the managing company of defendant A faced no punitive repercussions, revealing lapses in organizational accountability. The orchestrated nature of these companies formed for illicit data trading signifies that the unauthorized sale of personal data is becoming increasingly organized and sophisticated, rather than isolated incidents.

Reasons for Personal Data Breaches

To elucidate the phenomenon of personal data leakage in Vietnam, the authors identify several contributing factors categorized along the lines of technical, psychological-societal, and legal dimensions:

Technological Reasons

Inadequate information security infrastructure plagues businesses in Vietnam, as outlined in earlier assessments of the current situation. These enterprises often lack security measures proportional to the scale of their data repositories. Digital personal data serves as a valuable input in the digital economy and thus warrants comprehensive protection against unauthorized disclosures and abuses (Ministry of Public Security, 2019). While existing legal frameworks such as the 2018 Law on Cybersecurity and the 2015 Law on Network Information Security stipulate the corporate responsibility to develop rapid response strategies for security vulnerabilities, these mandates are not all-encompassing. They target specific entities operating in the cyber realm but neglect a wider range of stakeholders. This lacuna in regulation has led to a pervasive sense of complacency among businesses, fostering an environment where companies believe that existing security protocols are sufficient without staying abreast of emerging threats and vulnerabilities. Such attitudes render even robust four-layer security infrastructure ineffective against contemporary cyber-attacks, especially when criminals exploit lax security protocols within a business's supply chain (NK, 2022).

Psychological-Societal Reasons

Data subjects often demonstrate insufficient awareness of the significance of personal data protection. Empirical evidence from Vietnam reveals that not only do businesses and organizations display a laissez-faire attitude toward data security, but individual data subjects are also largely apathetic about how their data is utilized. For example, consumers frequently provide personal information when prompted by unsolicited advertisements for English courses, real estate, insurance packages, or beauty services. Enticed by promotional offers, individuals divulge sensitive information without adequate scrutiny of its ultimate purpose. Additionally, prevalent phenomena such as targeted online advertisements based on user behavior demonstrate how personal data is surreptitiously collected and leaked.

Legal Reasons

While Vietnam has enacted legislation pertaining to personal data, it remains an incomplete framework. The nascent legal document introduces fundamental concepts, principles, rights, and obligations but neglects to outline penalties for infractions. Existing legal stipulations, some of which have been in place for six to seven years, are increasingly incongruent with the evolving socio-economic landscape. This discordance has been exacerbated in the post-Covid era, given the rapid proliferation of online services requiring personal data, such as e-commerce, online payments, multiplayer online games, cryptocurrency trading, and network-based multi-level marketing.

Solutions to Fight Against Illegal Trading of Personal Data

Drawing from both theoretical and practical considerations, the authors propose several solutions to the issue of illegal trading of personal data in Vietnam as follows:

Firstly, there is a need for harmonization of legal provisions related to personal data protection. Vietnamese laws and regulations regarding personal data are scattered across various legal documents, resulting in multiple overlapping definitions and provisions. Thus, it is essential to consolidate these regulations into a dedicated legal document on personal data. This consolidation would provide a basis for other legal documents to regulate personal data in accordance with this law.

Secondly, personal data should be recognized as a form of property according to the 2015 Civil Code. Consequently, data subjects would have rights over this property, such as the right to possess, use, dispose of, and claim compensation for damages, in accordance with the 2015 Civil Code. Therefore, when formulating laws related to the exploitation of the economic value of personal data, principles of property rights can be applicable.

Thirdly, administrative fines should be based on the illegal profit gained from the illegal trading of personal data. Different types of personal data hold varying values for different individual entities. As a result, applying a uniform penalty would create disparities between economically powerful entities and smaller-scale entities.

Fourthly, developing specific provisions concerning rights such as the right to complain, the right to denounce, the right to initiate lawsuits, and various methods for safeguarding civil rights is essential. In practice, personal data being illegally traded never stops at affecting only one individual but often involves hundreds or even millions of people. Hence, organizations such as consumer protection associations, women's associations, organizations for the protection of the disabled and orphaned children, should have the right to represent data subjects in litigation. Consequently, the case will be examined from a more comprehensive perspective, avoiding situations where it is impossible to prosecute due to a lack of evidence.

Fifthly, establishing a mechanism for determining compensation levels for data subjects is imperative. As previously mentioned, each data file holds a different value, and when divided, the value of an individual piece of personal data within the file becomes minuscule. This results in data subjects being hesitant to engage in litigation even when aware of the illegal trading of their data. In such cases, the entity responsible for the data breach (i.e., the party who collected the data but failed to secure it) should be liable to provide actual compensation for data subjects, covering damages to health, property, and dignity.

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