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Issues and Perspectives in Business and Social Sciences

The effectiveness of microlearning approach from the perspectives of practicum teachers

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Abstract

Over the past years, practicum teachers have been assigned to schools for their teaching practicum. Many of them tend to struggle with the reduced attention span of students due to online learning. As such, microlearning has been seen to be the most recent method of teaching that could aid students to learn better. This research focuses on the interaction and relativity of microlearning with practicum teachers in the teaching and learning process. 8 groups of 20 students in each group were selected using a convenience sampling method, as the group of students were easily accessed by the researcher, and the practicum teachers acted as the data collectors for this research. The microlearning tool used to replace the traditional teaching method was a 3-minute video and images. All selected students are in the same level of studies which is in Year 8. Majority of them have the same proficiency level which is upper intermediate. The results show that microlearning did help with their classroom management and students were able to practise their scaffolding skills in a more effective manner.

Keywords:

microlearning;
attention span;
motivation;
qualitative study;
teaching methods

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1. Introduction

Due to the COVID-19 virus's almost universal dissemination, many educational institutions now offer online courses (Fitria, et al., 2022). The focus and attention span of students cannot be maintained consistently during study time, which is just one of the numerous difficulties in conducting online learning. Given that students' attention can wane after lengthy lecture times due to weariness and boredom, it is less practicable to make the online learning time equal to that of the in-person learning in class. In addition, it is expensive, especially when done remotely, and each student in the session needs their own personal electronic device to stay in touch with others throughout the same lesson hour.

It is exceedingly challenging to have a learner sit down in one place and continuously absorb instructional content and remain concentrated on a topic for hours in today's fast-paced environment full of distractions and online stimulation. Students nowadays struggle to avoid being distracted by their mobile devices. Furthermore, rather than only learning, students are engaged in a number of other activities at once. As many students take up part-time jobs, they tend to enrol in online courses and when they do so, they are either overworked or unable to

set aside two or three hours each week to finish the required compliance courses, and employees fall behind in their compliance training.

For these reasons, solutions are explored to address the issue of students' declining focus and attention. Hector Correa presented microlearning in 1963 as one of these solutions. Microlearning is a teaching pedagogy that aims to reduce learner fatigue by focussing on a single learning objective in less than 20 minutes (Díaz Redondo et al., 2021). Microlearning offers brief educational materials, often lasts only a few minutes, and is easily accessed via mobile devices (Palmer & Blake, 2018). For a number of learning phenomena, the idea of microlearning (ML) has repeatedly been emphasised as an efficient learning technique (Khong & Kabilan, 2020). Microlearning has also been viewed as a viable area for workplace education (Leong et al., 2020). Because it is simple to use and can be presented in a variety of ways, microlearning is growing in popularity. This makes it convenient for those who need to learn new information but are busy. Microlearning can also be used in conjunction with other learning methods and is inexpensive. The purpose of this learning is to impart knowledge in a way that makes it simpler for individuals to retain and use it in daily life.

One of the key benefits of microlearning is that it allows learners to consume and retain information more easily, as they are only presented with a small amount of content at a time. This makes it an ideal training method for learners with short attention spans or who need to learn and retain information quickly (Kroening, 2023). Attention span among students in the classroom has been a major issue since many years ago. Attention span has to be addressed well so that students are able to focus on all the content that they are absorbing in the teaching and learning process. In addition, with different proficiency levels is a common issue among learners of English as a Second language, microlearning is a good remedy for students with different proficiency level, as it presents information in smaller chunks and knowledge can be delivered in a smaller portion to allow students from all levels to understand.

Since the introduction of online learning, microlearning has gained popularity, and numerous institutions—including schools, businesses, and government agencies—have adopted it because it is believed to enable students to assimilate information more quickly and readily. In 2018, microlearning accounted for 60.7% of all e-learning. In 2020, microlearning adoption grew by 40% during the COVID-19 pandemic, and mobile learning is expected to be the preferred microlearning mode by 2025 (Corbeil & Corbeil, 2023). Microlearning, a novel approach that is anticipated to help students meet their learning objectives in e-learning, has evolved. Microlearning can be understood as small-scale learning activities because it comprises the two words: micro (which means little) and learning (which implies learning activities). In other word, microlearning is a technique for breaking up large amounts of learning content into manageable chunks.. The content in question takes the form of e-learning learning objects. As a result, microlearning has been identified as a technique that can assist individuals in resolving classroom-related problems.

Microlearning has been very helpful for new teachers, especially practicum teachers. Microlearning enables new teachers to experiment teaching methods in smaller chunks in order to not overwhelm them too much. Despite a well-established English Language Teaching curriculum in Malaysia, there are problems with how the curriculum is used in the classroom. The application of the learned theory in practice has a gap. According to Senom et al. (2013), there is no specialised new teacher induction programme to prepare teachers for the transition, hence new teachers in Malaysia do not receive appropriate support. In addition to supervision, pedagogical expertise, and topic understanding, pre-service teachers experience further difficulties in the ESL classroom. English has been the hardest for teachers as they face students with different proficiency levels and thus that complicates the entire situation further. As such, microlearning can be a good method in allowing new teachers to explore new possibilities that can help students to learn the language better as it is not too overwhelming

for them. Besides that, microlearning will allow students to learn different skills better as it is product oriented and focused as all the skills can be acquired sufficiently.

This study thus concentrates on how practicum teachers view microlearning among students in particular schools. This study aims to highlight practicum teachers' perceptions on microlearning methods used in their classroom. In addition, the study also raises awareness among practicum teachers on this current method that is vastly used in schools. In particular, the study seeks to address the following questions: (1) What is the effect of microlearning methods and tools on students' attention span? (2) What is the effect of microlearning methods and tools in lessons involving students with different language proficiency levels?

2. Problem statement

The learning process is not always optimised by e-learning; occasionally, some of the learning process objectives are not reached. Many notifications from social media, online gaming, or other distractions might easily keep some students using e-learning systems from their studies (Fitria, 2022). Because there are so many distractions that might cause students to lose focus when studying, it is difficult to provide material or content in e-learning. In Malaysia, e-learning is considered as a new method which has not been explored sufficiently. Consequently, the implementation of e-learning could take a little longer as there is no proper exposure to teachers. As such, practicum teachers face difficulties in making sure students have sufficient attention span. On top of that, the current e-learning method does not seem to cater to students who have different proficiency levels which makes it even harder for them to focus on their daily lesson. The problems become worse when the learning outcome is not achieved, and thus students' achievements have drastically decreased. Therefore, it is necessary to look into a method that can help students to learn better as e-learning is seen to be the new way of learning among students.

3. Literature review

One of the learning techniques that requires less time is microlearning. For this reason, short-term learning is frequently used to describe microlearning or microteaching. Although there is no accepted definition of microlearning, we may understand the general idea behind this approach using this knowledge. Microlearning is a learning strategy used by teachers that is more condensed. The first published use of the term "Microlearning" dates back to 1963 in a book called 'The Economics of Human Resource,' by Hector Correa. Microlearning came into the spotlight when the internet became much more accessible to domestic households in the mid-1990s. With the introduction of smartphones, microlearning too received a major boost. Suddenly everybody had a portable device that had access to the internet and could be used to deliver content more effectively. People could learn something new in a few short minutes. In this age when the attention span of a normal human is 8 seconds (as per a study by Microsoft, 2017), microlearning is a blessing. Moreover, it can be used for all kinds of training including but not limited to employee onboarding, compliance training, and skills training and education. Microlearning is a technique for short-term learning, to put it simply. Short-term learning activities and relatively small learning units are the focus of microlearning.

Microlearning refers to the learning process in a media-mediated environment and is used in e-learning and related domains. Microlearning is a comprehensive approach to education abilities related to relatively brief learning units. It involves a focus strategy for the short term created especially for understanding, learning, and skill-based education. As a result, the time needed to locate specific themes and contents can be reduced. Micro-learning also makes it possible to

access similar information, images, and videos in mobile environments in real-time (Park & Kim, 2018).

Microlearning can be described as short bursts of content that are delivered to students through a variety of delivery methods that include text, images, videos, audio, tests, quizzes, and games (Kulhanek & Mandato, 2022). Many people think that microlearning with video is a common and effective form. Video is not the only type of microlearning that uses this approach, though. E-learning, games, blogs, podcasts, infographics, and other visualisations are other examples. The type of media that best suits the circumstance and the student's unique learning demands must then be chosen. For instance, when we wish to learn how the cosmos was created and if we simply read one book about how the universe was created, we might not be able to comprehend the material in a brief amount of time because most books include language that is too lengthy and complex. It differs from seeing a film on how the cosmos was created, which we can find easier to comprehend in less time and is typically accessible via online platforms.

1. **Videos.** Everywhere there is internet access, people watch videos on Netflix, the YouTube platform, and other services. Not all of the videos, meanwhile, are accessible through microlearning. Microlearning films are typically presented in one of two ways: as Motion Graphics, like the What If example above, or as Video Explainer. Microlearning films are often brief and have an easy-to-understand presentation. In some scenes, an image and a description may be present. While amusing, videos nonetheless have an effect on students' understanding. Short video lengths and minimal file sizes that can be easily shared with classmates help learners maintain focus.
2. **Application.** The application mentioned in microlearning media is a learning programme that includes educational micro content and has navigational features to facilitate learning for students. Instructions for working on reading and performing exercises connected to the material being studied make up the learning concept used in the programme.
3. **Gamification.** Microlearning, or gamification, is comparable to learning apps in that they have learning objectives but disguises them as tasks that are more like games. The grade that students receive is more of an accomplishment than a result of the measurement theory's conventional scoring guidelines. The goal of this gamification is to engage students in more enjoyable learning activities while increasing motivation. An illustration of this gamification would be answering quiz questions where different people may receive different outcomes even though the results are the same.
4. **Infographics.** Infographics are two-dimensional media that use text, pictures, and other elements to convey information. By focusing on the information and aesthetics of the media generated, words are ordered in this way.
5. **Social media.** Microlearning can also incorporate social media. Because internet users also spend a lot of time on social media, it is crucial to be aware of this. Learning can be replaced by social networking sites like Facebook, Twitter, Instagram, and Tik Tok. Just that microlearning is linked to the content given in the platform, not the other way around. Every social media site has unique qualities, thus the microlearning materials that are distributed must reflect those traits. For instance, Instagram is extremely dependable with its picture content, so typography and infographics are acceptable micro-content, whereas Tik Tok excels at short-form films, so this platform is appropriate for Micro-content sorts of explainer videos or motion graphics.

There are several studies conducted in the area of microlearning. The authors from Near East University adapted microlearning-friendly materials in the format of video contents. They used

these videos to introduce microlearning to others in term of term, explanation, examples, potential and microlearning experience demands. While in Ozdamli et al. (2016), infographics have been examined as a microlearning tool. This qualitative research involved an anatomy class of 140 students, for a period of six weeks. Results of the study showed that students have better experience with infographics than traditional methods and visuals. Infographics are satisfying, easy to understand, and memorable for longer periods.

Besides that, there was another method which was proposed by Edge et al. (2012) called MemReflex. It is used to get fast-feedback from learners. They used flashcard systems to help students to learn about definitions, names, and dates. It depends on robust memorisations with posterior tests which come up to days later after using the flashcards. This approach not only utilises the short, scattered, dynamic opportunities for microlearning throughout the day but also helps learners who want motivation which is sourced from infallible study sessions.

4. Methodology

4.1 Research design

This research is qualitative research. The procedures for qualitative data collection and analysis had been conducted rigorously (e.g. sources of information, data analysis steps). Eight groups of 20 students in each group were selected through a convenience sampling method as the group of students were easily accessed by the researcher and the practicum teachers who acted as the data collectors. All students that were selected are in the same level of studies which is in Year 8. A majority of them have different proficiency levels ranging from beginner up to upper intermediate. The microlearning tool used was a 3-minute video and images to replace the traditional English class which uses the text book and activity book as the core curriculum methodology.

4.2 Research process

In this section, we will introduce the methodology of our work. Firstly, practicum teachers were instructed to conduct a microlearning lesson focusing on their students in their respective classroom. They were asked to complete the lesson within the first 4 weeks of their practicum. An interview was conducted to review their perception on the effectiveness of microlearning to their students. Then we compared the outcomes of their feedback. The findings were then transcribed to find out their opinion over microlearning. The methodology flow chart is shown in Figure 1:

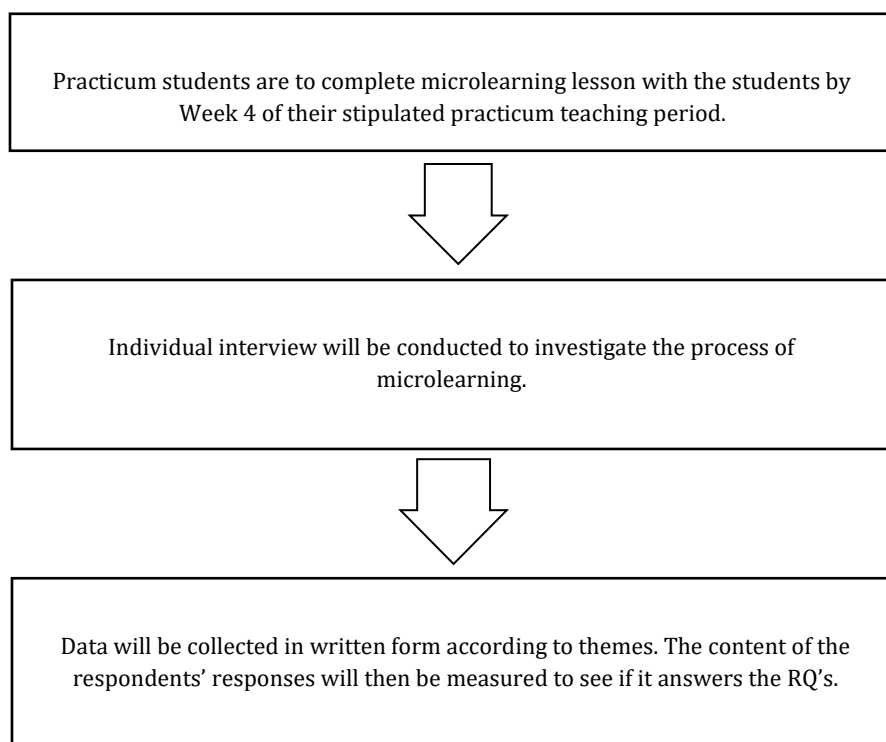


Figure 1: Research flow chart

5. Findings

The findings below are divided into four different themes, mainly on attention span, teaching methods, motivation and independent learning. Eight practicum-going teachers who would be teaching for the first time, were instructed to include a microlearning method and report its effectiveness are the transcribed statements of the 6 questions that were asked. Q1, Q2 and Q5 are for Research Question 1 where else Q3 and Q4 are for research question 2. We labelled the respondents as R1 till R8 indicating the eight practicum teachers who participated in this study.

5.1 Attention span

Q1 Do you think students were focused throughout the microlearning lesson?

R1: Yes, students were focused while watching the 3-video time frame as there was a different time limitation in every question they were answering from the video. After that, they focused on the analytic report and reflections.

R2: The students were able to focus throughout the lesson. The minority that usually has a shorter attention span compared to others were more engaged in the lesson during microlearning.

R3: Yes, students were more focused and willing to participate when discussing answers. According to my personal observation via the Pimsleur Language Assessment Battery (PLAB), my students were able to largely pay a significant amount of attention, focus and active

participation in the course of my English lessons. Nonetheless, it also depends on the personality of the students themselves. Under optimum conditions, students may find that the subjects and materials presented unto them during microlearning lessons tend to be more academically digestible in terms of their focus, which enables them to remain engaged and conscientiously motivated.

R5: Some students were focused and some of them were roaming around the classroom saying it was boring and they felt sleepy.

R6: Yes, students tend to be more focused when they are engaged in interactive and hands-on activities compared to the teacher's talking during the lesson.

R7: Yes, microlearning helped attract students' attention and made them more interested and engaged throughout the lesson.

R8: Yes, the students were all engaged during the lesson. The class is in complete silence while videos related to the topic of the day are played.

Majority of the students enjoyed the lesson and were able to provide their concentration except for R5 as there were mixed perceptions over the lesson in the classroom.

5.2 Students' focus

Q2 Through your observations, how long do students focus in the lesson?

R1: A good 30 minutes. I allocated 15 minutes for the Quizziz but students were focused until the end of the lesson, the remaining 15 minutes were where we did a reflection and revealed the analytical report of the Quizziz.

R2: In a 50-minute lesson, the students were focused for about 35 minutes when they were given a group task.

R3: Students focused for about 20 minutes at a time in a one-hour lesson.

R4: My teaching practice reports a 40-minute attention span in a 50-minute lesson for each student which is also accompanied by the length, content dexterity, and in general the overall complexity (difficulty) of the lesson. Nonetheless, it must be noted that my students may have a tremendous ability to only focus during short periods of a lesson during which the microlearning element has to be integrated with lessons which are both auditory and visually stimulating to them.

R5: In the 40-minute lesson only 15-20 minutes they were focused.

R6: Most of the students stayed focused for 80 minutes. Students get bored when they have to form sentences in the production stage.

R7: For the 1 hour and 30-minute lesson, the majority of the students were able to stay focused for 1 hour.

R8: Students focused for about 40 minutes in an hour lesson.

In general, many of them are able to stay focused for at least more than 30 minutes of lesson with this method.

5.3 Teaching methods

Q3 How was the effectiveness of the 3-minute video as a microlearning method that you have used in your lesson?

R1: It was a revision lesson so I utilised the video in the lesson in which students were using their phones to answer questions online via Quizizz. The correct answer will appear right after they are done answering all the questions, and also will be uploaded to their Google Classroom for revision. The answers will then be discussed in the next lesson for any clarifications.

R2: Peer learning was used in the lesson as the students were separated into groups to work together and determine the definition of the vocabulary and the synonyms that would fit into the context of the text from the **3-minute** video.

R3: TTT method with some scaffolding. I started the lesson with a connective crossword induction to give them words they can use to connect their persuasive writing. Next, I had students rearrange a persuasive text for 10 minutes to observe for students' understanding of the text. The **3-minute** video related to the topic was used and students were asked to explain about the video content.

R4: My teaching method is largely deductive in its nature with elements of differentiation (challenging intelligent students) whilst providing support to academically weaker students so that no one is left behind. However, some examples of microlearning techniques that has been respectfully exhibited in my lessons are as follows:

1. **Spaced learning technique:** *A method of teaching where my students would receive periodic instructions and feedback from me as the Teacher. However, this role is not to spoon feed them with academic content but to guide them via peer feedback as a facilitator that is ideal for 21st century learning.*
2. **Interactive Tasks:** *A method which involves my students in actively participating in collaborative group projects via the 3 min video use as it enhances group work.*

R5: I used the listening and speaking method and also the inquiry-based learning method with the **3-minute** video

R6: I played the **3-minute** video for students so that they are able to recall what they did during the school holidays. I asked students to write the activities they did during the school holidays in a mind map then discuss the answers with them. I also wrote and explained the vocabulary in both English and Mandarin for students to understand the vocabulary.

R7: **3-minute** Videos (of a short variety) - Videos were mainly used while teaching the lesson. For example, grammar-related YouTube videos assist students to acquire the information because of the attractive visuals.

R8: Youtube **3-minute** video. Cartoon videos explaining grammar items were used in my lesson. Attractive visuals will keep the students focused and understanding the content of the video. Images. Students like colourful pictures rather than words. This will attract their attention while doing their exercises.

5.4 Motivation

Q4 Do you think microlearning motivates students to complete their task on time?

R1: Yes, definitely. As I allocated a specific time to answer the question or task sheet, they were all very active and competent during the answering process. Hence, even though some of them might give incorrect answers, they would try their best to complete the task on time. As for different microlearning approaches such as video watching of a specific topic, the video-graphic will definitely prolong students' attention span, which makes them easier to understand and process faster for a certain lesson, while a hands-on task will build muscle memory of the students leading to an auto-retrieving knowledge for a specific task when encountering the similar task.

R2: Microlearning being in its bite-sized form of learning, serves as a motivation for students to complete their task as quickly as possible in order to move on to the next task. It allows students to be fully focused on one task at a time and provides ample time for the students to process, and digest the knowledge for scaffolding.

R3: I believe it motivates students to stay on task and finish them on time. Compared to lessons where microlearning was not used, more students were staying on task and helped me ensure students finish their task through each part being interspersed with discussion to check for understanding.

R4: Yes to a significant extent, as microlearning may prove to be beneficial as opposed to traditional forms of lecturing whilst granting my students the opportunity to focus on one particular subject at a time and practise it until they have successfully achieved their course learning outcomes based on the syllabus. On the other hand, since the major advantage of microlearning is the ability of the tutor to deliver the lesson in short chunks of time, my students are able to absorb the content in a timely manner which is more organised.

R5: In my opinion, for fast learners and good observers, yes they can but not for the slow learners or students who have lower proficiency level.

R6: Microlearning is an effective way to motivate and guide students to complete their tasks on time because it breaks down the learning content into small chunks that are less overwhelming and boring.

R7: It aids in keeping short attention span students on track and encourages them to complete their tasks on time. In my experience, providing students with pictures, videos, and games as instructional tools will enable them to comprehend their tasks more quickly and finish them on time.

R8: Yes, students find the class boring with just writing or completing their workbook. This will cause them to drag more time completing the task given as they are zoned out halfway doing the task. But teaching with materials that are aligned with the student's interests will keep them focused while completing the task.

According to the majority, there is evidence that microlearning has been a motivating factor in helping students to learn the lessons.

5.5 Independent learning

Q5 Do you think microlearning promotes independent learning among students?

R1: Yes. As students would be trying to understand the subject matter, bite-sized learning makes the process more efficient and easier. Students are able to learn at their own pace, they will be able to attempt different approaches that suit their capabilities and maximise the learning outcome. For instance, slower learners might take time to comprehend the complex definition or explanation in the text, but with microlearning everything has turned into smaller chunks which were simplified, slower learners are able to take it bit by bit and consume the knowledge without feeling pressured to learn independently.

R2: According to the nature of the task that was given, microlearning in teaching vocabulary aided in encouraging the students to learn and discover knowledge independently.

R3: As of so far, I have yet to observe any independent learning among my students. If used continuously, I believe it may encourage them by showing them how to break their work into smaller chunks to study bit by bit and make it less overwhelming.

R4: Yes, indeed. I strongly agree with the fact that microlearning does not only promote independent learning among students, but it is also the pinnacle of mankind's achievement in terms of developing rubrics for a holistic learning experience. In this scenario, by dividing huge chunks of content into smaller portions learners are not only more engaged, but in fact they ascend towards the ownership of participating in the very autonomy of out-of-classroom exploration and also in academic discovery within the fields of linguistics.

R5: I think not because not all learners or students could learn things independently because they are not so good in using technology learning and also they find it difficult to do their work like this.

R6: Yes, microlearning tasks are typically short therefore students are able to complete the task easily and independently without extensive guidance. Moreover, students are able to utilise gadgets and applications for microlearning.

R7: Absolutely, in my opinion, I believe that students will be more inspired to look out for videos or images that will further their understanding of the topic after watching the microlearning resources that were utilised in the class. Therefore, microlearning will encourage students to learn on their own.

R8: Indeed, the students are understanding the contents that the teacher is supposed to teach on their own. When students find the videos are fun although they are related to academics, this will stimulate their interest in finding similar videos to understand their homework assigned. This promotes the habit of finding resources on their own.

For these questions, the majority of the practicum students agrees that microlearning will help students to be more independent in their learning as they are exposed to trying new things by themselves with minimal supervision or guidance.

6. Discussion and conclusion

According to the results of findings as stated above, the answers to the Research Question for the research are as follows.

What is the practicum teachers' opinion on the students' attention span while using microlearning methods and tools during lesson? Majority of them stated that students have better attention spans when they are exposed to microlearning.

What are the advantages of embedding microlearning into in-class lesson involving students with different language proficiency levels? Majority of them believe that students are able to be motivated and independent in their learning, as the method is easy to absorb in daily lessons and also able to participate without hesitation in class as their attention span improved with this type of lesson method.

It is hoped that these methods will help practicum going teachers in handling the classroom as it is very important for the new teachers to have a variety of methods and experiment them as practicum is where all practicum teachers find their true momentum in their teaching ideology. Further research can be done on investigating microlearning among junior teachers and senior teachers in rural or urban schools or even high-performance schools.

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Issues and Perspectives in Business and Social Sciences

How do different values affect pro-environmental behaviours and happiness?

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Abstract

Schwartz's Value Theory has brought about a rebirth of research on human values. However, the mediating role of pro-environmental behaviours and happiness on human values is inadequate. Thus, this study adopted the bipolar dimensions of human values organised by Schwartz, self-transcendence, and self-enhancement as the independent construct of values to explore the mediating role of pro-environmental behaviours and happiness. Data were taken from a random sample of Klang Valley residents (N = 700) in Malaysia. Partial least squares and structural equation modeling tools were used to achieve the aims. The study found that self-transcendence plays a vital role in affecting pro-environmental behaviours and happiness. Pro-environmental behaviours lead to happiness, and it is an important mediator between human value with happiness. Happiness leads to pro-environmental behaviours, and it is also an important mediator between human values and pro-environmental behaviours. The results confirm that psychological factors (happiness) regarding the environment play a prominent role in determining pro-environmental behaviours. Hence, cultivating self-transcendence values is crucial to foster pro-environmental behaviours and boosting happiness. Engaging with pro-environmental behaviours is important to generate positive feelings, which will eventually boost happiness. Nurturing a sense of happiness will motivate pro-environmental behaviours as well.

Keywords:

human values;
self-enhancement;
self-transcendence;
pro-environmental
behaviours;
happiness.

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1. Introduction

One of the main objectives of environmental research is to know and forecast differences in environmental beliefs and behaviours to find the methods to motivate people to act more pro-environmentally. Based on the literature review, numerous research has found that personal values are the key determinant of pro-environmental behaviours (Stern et al., 1998); De Groot and Steg, 2008; Hornsey et al., 2016; Tolppanen and Kang, 2020). Human values and the priorities of these values are the key drivers that determine the future of the world. Values can be considered abstract concepts, but they shape a major part of an individual's identity. They determine human beliefs, standards, goals, attitudes, and actions in various conditions. They serve as a principle of human life. According to Voorn et al. (2021), human values guide our attitudes and actions. However, the diversity of the human system offers a multitude of educations, cultures, philosophies, religious beliefs, and social systems, which lead to various

human values and priorities concerning these values across different individuals, races, religions, communities, and countries. Therefore, it is necessary to identify a set of globally agreed human values, and the priority for these values that are widely followed. Schwartz's Value Theory has brought about a rebirth of research on values. Broad research in many countries has established the validity of this model beyond cultures.

However, cultures may vary in terms of the different levels of value priorities. Schwartz's Value Theory defines ten broad values (benevolence, universalism, self-direction, stimulation, achievement, power, security, conformity, tradition, and hedonism) based on the reason that underlies each of them. These values are worldwide because they are grounded on one or more of three worldwide requirements of human presence (Schwartz, 2012). Schwartz found that benevolence, universalism, and self-direction are the highest three values in the hierarchical across societies. Surprisingly, power and stimulation are the least important values. Looking at these values, they often conflict with each other; for instance, hunting achievement usually is controversial with practicing benevolence. Hence, Schwartz organised these values along two bipolar aspects (self-transcendence and self-enhancement) to capture the conflict between selflessness (self-transcendence) and self-interest (self-enhancement). The self-transcendence values included in this study are correcting injustice, equal opportunity for all, being free of war and conflict, conserving natural resources, unity with nature, harmony with other species, preserving nature, safety for loved ones, and honouring parents and elders. The self-enhancement values are influence, wealth, authority, and social power. Thus, this study adopted Schwartz's values of self-transcendence and self-enhancement as the independent construct variables to investigate their relationships with pro-environmental behaviours and happiness. Psychological factors surrounding pro-environmental behaviour such as happiness should be taken into consideration in developing better policy interventions to facilitate such behaviour (Kaida & Kaida, 2016).

2. Literature review

Previous studies suggested that personality traits, environmental-related values, beliefs, affection, and norms are antecedents of pro-environmental behaviour. However, protecting the environment is also rooted in motives for happiness and well-being (Choon et al., 2022). Hence, many researchers attempted to identify the emotional factors that affect pro-environmental behaviours. According to Fineman (1996), positive emotions such as happiness and spiritual well-being will sway pro-environmental behaviours. Pro-environmental behaviours will improve if a person has positive emotions concerning environmental involvement and sustainability. Environmental psychologists stress the role played by emotions as factors facilitating human adaptive behaviours. Relevant literature also showed sustainable behaviours are influenced by affective emotional factors (Corral-Verdugo, 2012). Inversely, plenty of literature also found that pro-environmental behaviours bring happiness to the actor. Referring to Hartig et al., (2001), some indications being pro-ecological can indirectly restore the psychological state that being exhausted due to stress. A society that practices sustainable behaviours should be happy or should be one on its way to achieving happiness (Guidi et al., 2008). From the literature, limited research is focused on the mediating role of pro-environmental behaviours and psychological factors such as happiness with human values. Does a happier person tend to sway to pro-environmental behaviours than an unhappier one? Does a pro-environmental behaviour person tend to be happier? How does a human value lead to pro-environmental behaviours and eventually lead to happiness? How does a human value lead to happiness and eventually lead to pro-environmental behaviours?

Happiness is one of the core positive emotions and neither a frivolity nor a luxury. It is an inherent desire shared by all living beings. Happiness can be an objective or a process or a manner

of thinking. If happiness is an objective, it can be explained from an economic perspective. Happiness is good, and unhappiness is bad. If happiness is a process, it is mainly an inter-relationship process between nature and the built environment with the self. If the relationship runs smoothly (based on the person's values, way of thinking, and interpretation), it will increase happiness and vice versa. The mind is the key to sustaining happiness. Unfortunately, our mind is very easily affected by nature and the built environment. Hales (2013) explained a psychologically healthy person as someone who demonstrates suppleness and adaptability to diverse conditions, a feeling of meaning and assertion in life, an awareness that oneself is not the centre of the universe, compassion, and the ability to be selfless, an increased depth and contentment on the close relationships and a sense of self-control over the mind and body. Hence, human values and the priority of these values will determine one's beliefs, standards, goals, attitudes, and actions in various conditions that directly affect a person's happiness. This study adopted Lyubomirsky and Lepper's (1999) General Happiness Scale measurement. This measurement has been widely used by many researchers (Soga et. al., 2021; Grouden & Jose, 2015; Diener et. al., 2010). Three questions that are included to form the construct are "In general, I consider myself happy"; "Compared to most of my peers, I consider myself happy" and "I enjoy life, regardless of what's going on".

Pro-environmental behaviour is a type of behaviour that intentionally pursues to reduce the negative effect of one's activities on the nature and built environment (Kollmuss and Agyeman, 2002). The success or failure to combat environmental problems nowadays is very much dependent on the cultivation of pro-environmental behaviours. Based on Dietz et al., (2009), pro-environmental behaviour is a vital element to mitigate climate change and other environmental issues (Dietz et al., 2009). Many environmental threats nowadays are rooted in human behaviour, such as excessive consumption. A change in human behaviour is the most convincing solution to lower the damaging impacts of environmental threats. Pro-environmental behaviour is pro-social, and it helps others through some open costs to the performer (Schmitt et al., 2018). In general, pro-environmental behaviour is a kind of behaviour that benefits the environment and minimises damage to the environment (Steg and Vlek, 2009). To measure pro-environmental behaviours, the study adopted and modified five items (buying local foods, using a washing machine while full load, and turning off energy devices while not in use, etc.) from Kaiser's (1998) General Ecological Behaviour Scale.

How does the difference in human values affect pro-environmental behaviours and happiness? Based on Schwartz's Value Theory, self-enhancement and self-transcendence are the two main dimensions of value. This study intends to examine the direct and indirect relationships between the two dimensions of value with pro-environmental behaviours and happiness. The two dimensions of value are the independent variables. Pro-environmental behaviours and happiness are the mediators or dependent variables in two different models.

2.1 How does a human value mediated by pro-environmental behaviours lead to happiness?

Model 1: Self-enhancement value – Pro-environmental behaviour – Happiness
Self-transcendence value – Pro-environmental behaviour – Happiness

One of the critical social dilemmas facing the world today is how to achieve a balance between environmental conservation and economic development. Based on the literature review, people who intensely support self-transcendence values act more pro-environmentally with stronger pro-environmental beliefs and norms. Inversely, people who intensely support self-enhancement values have weaker pro-environmental beliefs, and norms and act less pro-environmentally (Schultz, et al., 2005; Wall, et al., 2007; De Groot and Steg, 2008; Steg and Vlek, 2009; Liobikienė and Juknys, 2016; Cavagnaro et al., 2021). According to Muralidharan and Sheehan (2017), people

who posed higher self-transcendence values tend to be more environmentally conscious. Hence, an environmental tax penalty seems more effective for these people. A study by Goldsmith et al. (2016) also found that self-transcendence personalities are more likely to stimulate recycling behaviours than self-enhancement personalities. When personal identity is salient, self-transcendence intentions affect green consumption greater than self-enhancement intentions (Costa et al., 2016). In another study conducted by Stringer et al. (2021), self-transcendence values have a positive impact on consumers' levels of ethical concern towards animal welfare, the environment, and worker welfare concerns within the fashion industry as well. Therefore, past literature has shown that different human values are affecting pro-environmental behaviours differently. Rationally, everyone will be better off if we conserve the environment. However, self-interest always stimulate environmental exploitation. How human values affect pro-environmental behaviours always draws greater attention in the literature. Hence, different human value is an important variable that needs to be studied to improve human-environmental behaviours (De Groot et al., 2012). The following hypotheses were developed:

H1: Self-enhancement positively influences pro-environmental behaviour.

H2: Self-transcendence positively influences pro-environmental behaviour.

People mostly act the way they do because of the optimistic consequences of their actions (Lehman and Geller, 2004; McAfee et al., 2019). Many previous studies on conservation psychology found that individuals who always care for their physical and social surroundings are happier. In addition, people who are frequently involved in pro-environmental behaviours see themselves as happier than those who are not. According to Mackerron and Mourato (2013), pressure reduction and renewal of attention, lower environmental 'bad', and encouraging physical and mental activities such as physical exercise, leisure, and community interaction are among the three main factors that are positively linked to well-being and health through the engagement with the natural environments. Many individuals are involved in environmental protection activities to experience pleasure and well-being (Corral-Verdugo, 2012). Based on White et al. (2019), a rise in epidemiological evidence indicates that contact with natural environments is associated with better health and well-being. Thus, subjective nature connectedness is a robust predictor of pro-environmental behaviour that is positively associated with subjective well-being (Capaldi et al., 2014). Referring to a study by Tiwari (2016), sustainable behaviours are positively related to happiness. Similarly, another study conducted by Aldieri et al. (2019) also revealed a positive relationship between eco-efficiency and happiness. Based on Slimak and Dietz (2006), self-transcendence values would lead to inherent motives to protect the environment while defeating values that support self-enhancement. Thus, happiness is one of the expected outcomes of pro-environmental behaviours. Sustainable behaviours such as waste reduction is contributing to happiness (Landes et al, 2015). The third hypothesis is stated as follows:

H3: Pro-environmental behaviour positively influences happiness.

Most of the past literature showed a direct relationship between self-transcendence and happiness. According to Dambrun (2017), self-transcendence is positively related to authentic-durable happiness, while self-enhancement was positively linked to the fluctuation in happiness. Besides that, self-transcendence foresees happiness positively and significantly (Joshnloo et al., 2016). Lee and Kawachi (2019) discovered any individuals who pursue self-enhancement values are less happy as compared to those who pursue self-transcendence values. A study by Garland and Fredrickson (2019) found that self-transcendence values will generate healing effects on addictive behaviours. Referring to Liu et al. (2021), self-enhancement values are positively correlated with depression and loneliness, while both self-transcendence values are negatively correlated with depression and loneliness. For this reason, human values positively influence happiness and may be mediated by changing human habits and cultivating new habits of pro-environmental behaviours. Therefore, pro-environmental behaviour is a potential mediator between human values and happiness. H4 and H5 are formulated as follows:

H4: Self-enhancement positively influences happiness, and this is mediated by pro-environmental behaviour.

H5: Self-transcendence positively influences happiness, and this is mediated by pro-environmental behaviour.

2.2 How does a human value mediated by happiness lead to pro-environmental behaviour?

Model 2: Self-enhancement value – Happiness – Pro-environmental behaviour
Self-transcendence value – Happiness – Pro-environmental behaviour

As mentioned earlier, numerous studies have found people's happiness enriches as they place rather less importance on material objectives and values (Kasser et al., 2014). Based on a study by Kao et al. (2017), individuals who are self-transcendence orientated are more capable of conquering negative emotions as compared to individuals who are self-enhancement orientated. The pursuit of self-enhancement values will increase anxiety due to uncertainty. In contrast, the pursuit of self-transcendence values expresses anxiety-free motivations (Schwartz, 2012). The feeling of anxiety versus anxiety-free may be the reason for self-transcendence, which is associated with a higher level of happiness as compared to self-enhancement. In addition, individuals who are self-transcendence orientated demonstrate greater positive emotion and the least negative emotion, whereas individuals who are self-enhancement orientation exhibit more negative emotion and least positive emotion (Nilsson et al., 2014). Referring to Wong (2016), self-transcendence expresses people's spiritual nature, which is fundamental to healing and well-being. Self-transcendence values can alter a self-focus, inflexible, and defensive person to become an open and flexible person. Self-transcendence values can inspire other focus by incorporating repay in the brain (Kang, 2019). Hence, the following is expected:

H6: Self-enhancement positively influences happiness.

H7: Self-transcendence positively influences happiness.

World Happiness Report (Helliwell et al., 2012) has called for more studies to investigate the relationship between happiness and environmental sustainability. A happier person may be more pro-environment as compared to a less happy person. Based on Corral-Verdugo (2012), positive emotions are one of the precursors that stimulate sustainable behaviour. Happiness is one of the greatest positive emotions (Van de Vliert and Janssen, 2002). Conservation psychology also tried to find a relationship between happiness and pro-environmental behaviours (Bechtel and Verdugo, 2010). Happiness should be considered when environmental theories are constructed. Referring to a study by Abdollahi et al. (2015), individuals who have high emotional intelligence show better waste prevention behaviours. Individuals with higher emotional intelligence show greater respect for the self, others, and the environment (Cote et al., 2010). Hence, a happier person is more prone to involve in waste management and sustainable behaviours. Positive emotion could guide them to love their surroundings and act accordingly (Landes et al, 2015). Therefore, happiness positively affects pro-environmental behaviours. H8 is developed as follows:

H8: Happiness positively influences pro-environmental behaviour.

The mediating role of happiness is worth exploring too with the limited current research. How does happiness mediate the relationship between human values and pro-environmental behaviours? Emotional connection with nature will lead to an enlarged self and better respect for non-human species, and encourage pro-environment behaviours (Gosling and Williams, 2010). Based on a study conducted by Corral-Verdugo (2012), sustainable behaviour is significantly influenced by a "happiness" factor. Hence, happiness is a potential mediator between human values and pro-environmental behaviours. A happier person may be more actively engaged with pro-environmental behaviours and vice versa. A feeling of amazed is deemed to be one typical

self-transcendence experience (Stellar et al., 2017). Thus, happiness is a potential mediator between human values and pro-environmental behaviours. The relevant hypotheses are:

H9: Self-enhancement positively influences pro-environmental behaviour, and this is mediated by happiness.

H10: Self-transcendence positively influences pro-environmental behaviour, and this is mediated by happiness.

3. Research methods

The study employed F-tests to compute the statistical power and estimate the lowest sample size needed. Since the model had most of two predictors, the effect size, the power needed, and the sample size required were fixed as small 0.02, 0.90, and 636, respectively. A total of 710 questionnaires were distributed within the Klang Valley, Malaysia based on the stratified sampling method. The population was separated into different "strata" based on age and area. Each stratum was tested as a separate sub-population, with individual elements randomly chosen. The age ranges were from 13–21, 22–30, 31–45, 46–60, and 61 and above. The research area covered all the ten city councils in the Klang Valley: Kuala Lumpur City Hall (66 respondents), Putrajaya City Council (50 respondents), Petaling Jaya City Council (70 respondents), Shah Alam City Council (70 respondents), Subang Jaya City Council (98 respondents), Ampang Jaya City Council (70 respondents), Sepang City Council (59 respondents), Klang City Council (72 respondents), Selayang City Council (65 respondents) and Kajang City Council (80 respondents). A sum of 700 completed surveys was received with a 98.60% of response rate. A research questionnaire was created with four parts: namely, demographics, values of life, happiness level, and pro-environmental behaviour. The respondents living in the Klang Valley were asked about the human values that guide their principles of life, their current happiness level, and whether they act pro-environmentally. Except for the demographic and happiness sections, a 7-point Likert scale questionnaire was created for each item varying from 1 (strongly disagree) to 7 (strongly agree). The subjective happiness scale (SHS) developed by Lyubomirsky, S. & Lepper, H. (1999) was adopted to measure happiness. A 10-point Likert scale questionnaire was planned for each item. The questionnaires were circulated head-on from December 2018 to January 2019. A pilot test was performed with 70 respondents taken out from the sample. The responses from the pilot testing were reassessed, and slight improvements were made.

4. Empirical results

4.1 Respondents' profile

The respondents comprised of 53.30% males and 46.70% females out of 700 completed questionnaires. Each age group consisted of 18% to 23% of the entire respondents. About 48.90% of the respondents hold a bachelor's degree or higher. More than 70% of the respondents had attended religious education, with 56.30% having attended religious education for more than one year. Most of the respondents make below RM 6,000 per month (79.40%) and live in an urban area or urban centre (59.50%). Approximately 65.60% of the respondents have never volunteered in any environmental-related social activity. The details are presented in Table 1.

Table 1: Demographics of the respondents

Characteristics	Frequency	%	Characteristics	Frequency	%
Gender			Age		
Male	373	53.30	13 to 21	146	20.90
Female	327	46.70	22 to 30	161	23.00
			31 to 45	135	19.30
			46 to 60	132	18.90
			61 and above	126	18.00
Formal Education			Religion Education		
Primary School & below	51	7.30	Yes	493	70.40
SPM/High School	165	23.60	No	207	29.60
Certificate	33	4.70			
Diploma	109	15.60			
Bachelor's degree	284	40.60			
Master's degree	44	6.30			
PhD	14	2.00			
Period of Religion Education			Monthly Income		
Never	206	29.40	Less than RM1,001	243	34.70
Less than 1 year	100	14.30	RM1,001 to RM3,000	162	23.10
1 – 3 years	102	14.60	RM3,001 to RM6,000	151	21.60
4 – 6 years	115	16.40	RM6,001 to RM8,000	63	9.00
7 – 10 years	60	8.60	RM8,001 to RM10,000	40	5.70
More than 10 years	117	16.70	More than RM10,000	41	5.90
Area			Volunteer Experience		
Rural	71	10.10	Yes	248	35.40
Sub-urban	213	30.40	No	452	65.60
Urban	361	51.60			
Urban Centre	55	7.90			

4.2 Data analysis

To verify the measurement tool, a reliability test was implemented. The results showed high-pitched reliability, with $\alpha \geq 0.90$. Partial least squares and structural equation modelling instruments were used. Convergent validity and discriminant validity were assessed. Subsequently, the structural model was analysed by examining the hypothesised connection. The bootstrapping method (5000 resamples) was employed to examine the magnitude of the path coefficients (Hair et al., 2014).

4.2.1 Measurement and structural model assessment for Model 1

To measure the construct validity of the construct it claims to be measuring, two major elements of measuring, specifically, convergent validity and discriminant validity were used. SEM is capable of evaluating the build validity of a proposed measurement theory. Based on Gholami et al. (2013), the loadings, average variance extracted (AVE), and composite reliability (CR) are the three measurements that need to be established for convergent validity. The loadings and AVE should be above 0.50 as recommended by the literature Besides that, the CR requirement also should be above 0.70 as recommended. Table 2 indicates the particulars of the full convergent validity for Model 1.

Table 2: Measurement model assessment for Model 1 (Mediator: Pro-environmental behaviours)

Construct	Item	Loading	AVE	CR
Self-enhancement	P1	0.82	0.74	0.92
	P2	0.83		
	P3	0.91		
	P4	0.88		
Self-transcendence	J1	0.79	0.66	0.93
	J2	0.75		
	J3	0.77		
	N1	0.84		
	N2	0.85		
	N3	0.83		
	N4	0.84		
	Pro-Environment Behaviours	B1		
B3		0.74		
B4		0.73		
B5		0.78		
Happiness	H1	0.91	0.82	0.93
	H2	0.93		
	H3	0.89		

Note: B2 was removed due to low loadings

To test whether concepts or measurements are not supposed to be related, discriminant validity is required. The respondents should be able to differentiate the questions among the constructs. For example, the value of life and happiness cannot be greatly correlated. The discriminant validity was researched based on the criterion of Fornell and Larcker (1981) by contrasting the correlations among the constructs and the square root of AVE for the construct. According to Chin (2010), the AVE of a latent variable should be more than the squared correlations among the latent variable and entirely other variables. Table 3 shows the particulars of the discriminant validity for Model 1. The results showed all the values taking place at the diagonals were bigger than the corresponding row and column values. Therefore, the measurements were discriminant.

Table 3: Discriminant validity for Model 1 (Mediator: Pro-environmental behaviours)

	Self-enhancement	Self-transcendence	Pro-Environment Behaviours	Happiness
Self-enhancement	0.86			
Self-transcendence	0.52	0.81		
Pro-Environment Behaviours	0.26	0.37	0.73	
Happiness	0.19	0.33	0.23	0.91

Note: Emphasised (diagonal) values represent the square root of the AVE and other values (off-diagonal) represent the correlations.

After completing the construct validity checking, we proceeded with the path analysis for hypothesis testing. Figure 1 and Table 4 present the results. Figure 1 shows that self-enhancement and self-transcendence explained 14.10% of pro-environmental behaviour, whereas pro-environmental behaviour explained 5.20% of happiness. To determine whether the data were normally distributed, this study implemented Kolmogorov–Smirnov (K-S) test and the result implied normal distribution. As the data were expected to be nonparametric, bootstrapping was carried out to get the accurate P-value by altering the standard errors.

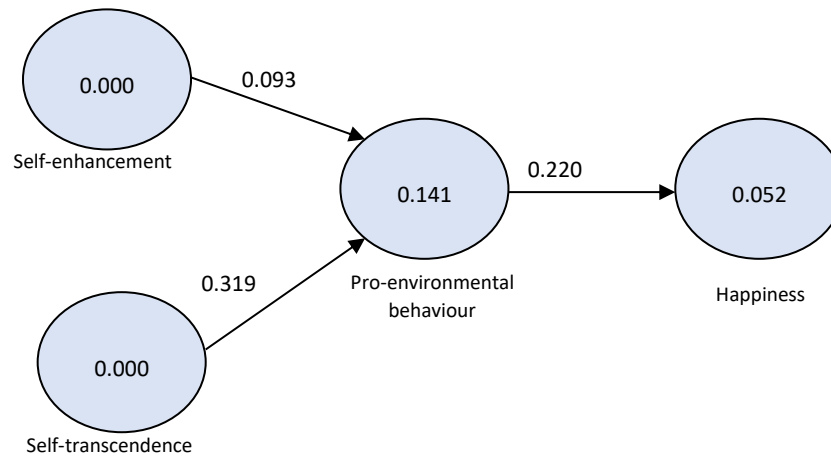


Figure 1: Hypotheses testing for Model 1 (Mediator: Pro-environmental behaviours)

Table 4: Path coefficients and hypothesis testing for Model 1 (Mediator: Pro-environmental behaviours)

Hypothesis	Relationship	Coefficient	Standard Error	t-value	Decision
H1	Self-enhancement -> Pro-Environment Behaviours	0.09	0.05	1.97	Not supported
H2	Self-transcendence -> Pro-Environment Behaviours	0.32	0.05	6.40***	Supported
H3	Pro-Environment Behaviours -> Happiness	0.23	0.04	5.89***	Supported
H4	Self-enhancement -> Pro-Environment Behaviours -> Happiness	0.02	0.01	1.78	Not supported
H5	Self-transcendence -> Pro-Environment Behaviours -> Happiness	0.07	0.02	3.48***	Supported

The results showed that self-transcendence was significantly positively connected ($\beta = 0.32$, $p < 0.01$) to pro-environmental behaviour, likewise, the pro-environmental behaviour was also significantly positively linked ($\beta = 0.23$, $p < 0.01$) to happiness. However, self-enhancement was not a significant predictor of pro-environmental behaviour. Hence, H2 and H3 were supported, while H1 was not. The bootstrapping analysis presented that the indirect effect for H5 ($\beta = 0.07$) was significant with a t-value of 3.48. However, H4 ($\beta = 0.02$) was not significant with a t-value of 1.78. Referring to Preacher and Hayes (2008), the indirect effect directed H5 = 0.07, 95% Boot CI: [LL = 0.03, UL = 0.11] did not straddle a 0 showing that mediation occurred. However, the indirect effect for H4 = 0.02, 95% Boot CI: [LL = -0.00, UL = 0.05] straddled a 0, thereby showing that no mediation occurred. So, we can conclude that self-transcendence values on the perceived extent of happiness were mediated by pro-environmental behaviour. Whereas self-enhancement values on the perceived extent of happiness were not mediated by pro-environmental behaviour.

4.2.2 Measurement and structural model assessment for Model 2

Referring to Gholami et al. (2013), convergent validity is established by examining the loadings, average variance extracted (AVE), and composite reliability (CR). The loadings and AVE should be above 0.50 and the CR must be above 0.70 as recommended in the literature. Table 5 displays the particulars of full convergent validity for Model 2.

Table 5: Measurement model assessment for Model 2 (Mediator: Happiness)

Construct	Item	Loading	AVE	CR
Self-enhancement	P1	0.80	0.74	0.92
	P2	0.90		
	P3	0.91		
	P4	0.87		
Self-transcendence	J1	0.79	0.66	0.93
	J2	0.75		
	J3	0.78		
	N1	0.85		
	N2	0.84		
	N3	0.83		
	N4	0.85		
Happiness	H1	0.91	0.82	0.93
	H2	0.93		
	H3	0.88		
Pro-Environment Behaviours	B1	0.63	0.53	0.82
	B3	0.76		
	B4	0.68		
	B5	0.82		

Note: B2 was removed due to low loadings.

Based on Fornell and Larcker (1981), the discriminant validity was tested by assessing the correlations among the constructs and the square root of AVE for the construct. The AVE of a latent variable ought to be above the squared correlations amid the latent variable and other variables. Table 6 shows the particulars of the discriminant validity for Model 2. The results showed all the bolded (diagonal) values were bigger than the corresponding row and column values. Therefore, the measures were discriminant.

Table 6: Discriminant validity for Model 2 (Mediator: Happiness)

	Self-enhancement	Self-transcendence	Happiness	Pro-Environment Behaviours
Self-enhancement	0.86			
Self-transcendence	0.52	0.81		
Happiness	0.19	0.33	0.91	
Pro-Environment Behaviours	0.26	0.36	0.24	0.73

Note: Emphasised (diagonal) values represent the square root of the AVE and other values (off-diagonal) represent the correlations

Figure 2 and Table 7 showed the path analysis results. Figure 2 revealed that self-enhancement and self-transcendence explained 10.80% of happiness, whereas happiness explained 5.50% of pro-environmental behaviour. The Kolmogorov–Smirnov (K-S) test showed that the data were normally distributed. As the data were expected to be nonparametric, bootstrapping was carried out to get the accurate P-value by altering the standard errors.

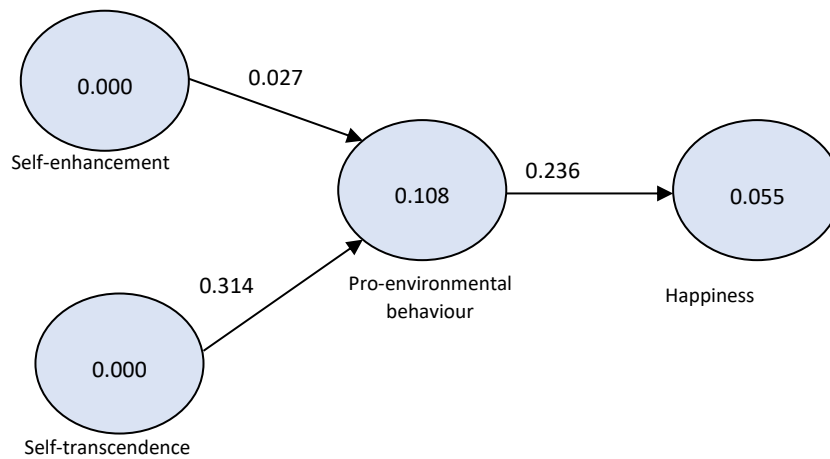


Figure 2: Hypotheses testing for Model 2 (Mediator: Happiness)

Table 7: Path coefficients and hypothesis testing for Model 2 (Mediator: Happiness)

Hypothesis	Relationship	Coefficient	Standard		Decision
			Error	t-value	
H6	Self-enhancement -> Happiness	0.03	0.05	0.56	Not supported
H7	Self-transcendence -> Happiness	0.31	0.06	5.69***	Supported
H8	Happiness -> Pro-Environment Behaviours	0.24	0.04	6.23***	Supported
H9	Self-enhancement -> Happiness -> Pro-Environment Behaviours	0.01	0.01	0.53	Not supported
H10	Self-transcendence -> Happiness -> Pro-Environment Behaviours	0.07	0.02	3.69***	Supported

The results showed that self-transcendence was significantly positively linked ($\beta = 0.31$, $p < 0.01$) to happiness, likewise, happiness was also significantly positively connected ($\beta = 0.24$, $p < 0.01$) to pro-environmental behaviour. However, self-enhancement was not a significant determinant of happiness. Hence, H7 and H8 were supported, while H6 was not. The bootstrapping analysis indicated the indirect effect for H10 ($\beta = 0.07$) was significant with a t-value of 3.69. However, H9 ($\beta = 0.01$) was not significant with a t-value of 0.53. Moreover, the indirect effect for H10 = 0.07, 95% Boot CI: [LL = 0.04, UL = 0.11] did not straddle a 0 displaying the mediation existed. However, the indirect effect for H9 = 0.01, 95% Boot CI: [LL = -0.02, UL = 0.03] straddled a 0, thereby exposing no mediation existed (Preacher and Hayes, 2008). Hence, we can conclude that the value of self-transcendence in pro-environmental behaviour was mediated by the perceived extent of happiness, whereas the value of self-enhancement on pro-environmental behaviour was not mediated by the perceived extent of happiness.

5. Discussion

The present study provides three important insights for designing strategies to encourage pro-environmental behaviours. First, self-transcendence value is the facilitating factor of pro-environmental behaviours. Second, pro-environmental behaviours lead to happiness, and it is an important mediator between human value with happiness. Third, happiness leads to pro-environmental behaviours, and it is an important mediator between human values and pro-environmental behaviours. The results confirm that psychological factors (happiness) regarding the environment play a prominent role in determining pro-environmental behaviours.

This study found the important role of self-transcendence, which shed light on boosting pro-environmental behaviours and happiness. More specifically, it emerged the influence of self-transcendence on happiness is higher when individuals actively engaged in pro-environmental behaviours. Similarly, the influence of self-transcendence on pro-environmental behaviours is greater when individuals acknowledge their current condition as a context in which they feel happy. Based on Lyubomirsky (2012), individuals tend to feel happy when they experience more and a variety of positive events in their life. Thus, our findings of this study could be explained by Lyubomirsky's theory on the necessity to reside in a social setting that is perceived as various and stimulating. Specifically, individuals with self-transcendence orientation are more actively engaged with pro-environmental behaviours. Thus, they tend to stimulate greater happiness. Besides that, individuals with self-transcendence orientation are happier. Hence, they tend to engage in pro-environmental behaviours. Based on Lazarus and Folkman (1984), looking at ourselves positively is an essential psychological resource for coping especially when we are facing the most adverse condition. Therefore, self-transcendence is an essential human value that needs to be cultivated. Pro-environmental behaviours and happiness are interrelated amid the self-transcendence orientation of individuals. However, self-enhancement does not play any significant role in affecting pro-environmental behaviours and happiness.

In summary, self-transcendence plays a fundamental role to influence pro-environmental behaviours ($\beta = 0.32$) and happiness ($\beta = 0.31$). However, self-enhancement does not significantly influence pro-environmental behaviours and happiness. In terms of the mediation effect, the degree of self-transcendence on happiness is mediated by the pro-environmental behaviours ($\beta = 0.07$) as shown in Model 1. However, pro-environmental behaviours are not mediated the degree of self-enhancement in happiness. Hence, self-transcendence is a key value that needs to be developed to nurture pro-environmental behaviours. This result is similar to many previous studies such as Waqas et al. (2018), and Muralidharan and Sheehan (2017). Waqas et al. (2018) found that self-transcendence and self-enhancement have positive and negative moderating effects consecutively on the acceptability of sustainable transportation in China. Muralidharan and Sheehan (2017) also found high self-transcendence consumers were more environmentally conscious. Human values are highly correlated with responsibility and eventually encourage energy saving (Boto and Buccioli, 2020). Therefore, it is important to cultivate self-transcendence values in school to ensure the success of fostering pro-environmental behaviours.

Since pro-environmental behaviour is an important mediator that will eventually boost happiness, more pro-environmental activities should be implemented at the school level and expanded to society to reduce depression and mental illnesses. Referring to Malaysian National Health and Morbidity Survey conducted by the Institute for Public Health in 2015, it is estimated that 29.9% of adults in Malaysia are experiencing mental health problems such as depression and anxiety. This number represents an alarming increase from the prevalence of 10.7% estimated by the NHMS in 1996. A study conducted by Rosa et al. (2018) in Brazil found that individuals with excessive interaction with nature throughout childhood tend to accompany by a greater connection with nature when they become adults. These people will eventually positively be linked to pro-environmental behaviours. The stimulation of happiness feels while interacting with nature during childhood seems like activating the relationships with nature during adulthood and subsequently embracing pro-environmental actions. Similarly, engaging in pro-environmental behaviours tends to generate positive feelings or happiness experiences that will eventually boost happiness.

As shown in Model 2, the degree of self-transcendence in pro-environmental behaviours is mediated by happiness ($\beta = 0.07$). However, happiness is not mediated by the degree of self-enhancement in pro-environmental behaviours. Hence, nurturing a sense of happiness is important as it will mediate the relationship between self-transcendence and pro-environmental behaviours. Happiness is a crucial dimension in individual lives, it is vital when inventing public policies to enhance people's quality of life (Landes et al, 2015). According to Benevene et al. (2019), a teacher's level of happiness at work is mediating the relationship between self-esteem

and a teacher's health. Feeling positive emotions tends to increase the range of the choices to be considered (Fredrickson and Branigan, 2005). Hence, negative emotions will narrow down the choices available in the mind. Thus, cultivating a sense of happiness is important that will eventually boost pro-environmental behaviours.

6. Limitations

Although this research found some interesting findings and implications, it is also important to highlight the limitations. One of the drawbacks of this research is that the subjective pro-environmental behaviours may not be the actual behaviours. Further studies can be performed to investigate the actual pro-environment behaviours of the respondents by using longitudinal modelling or direct observation methods. In addition, data were collected by using self-report measures in the present survey, which might have limited the reliability of data on pro-environmental behaviours and happiness that were used in the analysis. Besides that, the research can be expanded to other areas in Malaysia. Cross-cities research may enrich the findings. Although the present study was carried out with Malaysian residents, the results are consistent with previous studies. This study also suggests that no significant cultural difference exists regarding the conceptual structure between pro-environmental behaviour and happiness. However, pro-environmental behaviours enhance happiness and can be further perceived as present happiness or future happiness. These findings can be further investigated from cultural and socio-economic perspectives in a future study. Furthermore, happiness lexicons such as eudemonia and hedonic could be further addressed. Happiness research is potentially altering the study of sustainable development in the future.

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Issues and Perspectives in Business and Social Sciences

Awareness and perception of alternative dispute resolution methods in Penang

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Abstract

Alternative dispute resolution (ADR) methods serve as cheaper and faster options to settle disputes in place of litigation. Although the local government and relevant ADR bodies in Malaysia have been taking initiatives to promote ADR to lighten overloaded courts' load and create a peaceful and harmonious society, the awareness level still leaves room for improvement. This study aimed to investigate the perception and awareness level of ADR in Penang. Questionnaires were distributed to the course participants of an ADR training course in Penang. The analysis shows that while a large majority of the participants were aware of ADR before enrolling in the course, more than half of them believed that ADR methods were not actively utilised in Malaysia while about two-thirds believed that the general public was not aware of such options. Actions such as more media campaigns and greater institutional support should be undertaken to educate and heighten the public's awareness about the ADR's availability, processes and functions so that they could be translated into greater usage.

Keywords:

alternative dispute resolution;
perception;
adjudication;
arbitration;
mediation.

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1. Introduction

Conflicts have existed since time immemorial and will continue to exist as long there is competition for basic requirements (Ojo, 2023; Shamir, 2016). However, today's society has become more litigious, resulting in an increase in court cases over the years. Court cases are more adversarial in nature and could take up to three years to resolve (Yong, 2023), draining the parties both financially and emotionally. Along with the efforts to find less adversarial and effective ways to solve disputes other than traditional litigation, alternative dispute resolution (ADR) methods were established (Mohamad Bahri et al., 2023; Rahmat et al., 2022).

ADR is a collection of practices and techniques designed to allow legal disputes to be settled out of court (Mnookin, 1998). Options to resolve disputes without litigation include adjudication, arbitration, and mediation, being cheaper and faster options to solve conflicts (Fiadjoe, 2004; Mnookin 1998).

The ADR movement started in developed countries such as the United Kingdom, Australia and America (Rahmat et al., 2022). In Malaysia, it has slowly gained popularity with the introduction of various Acts to regulate its usage such as the Mediation Act 2012, the Arbitration Act 2005, and the Construction Industry Payment and Adjudication Act 2012 (CIPAA) by the Malaysian government.

The usage of ADR has long been practised culturally in Malaysia, especially for mediation which has deep roots in cultural traditions and could be traced back to the days when it was done by community leaders (Ahmad et al., 2022). In older societies, the wise elders of the communities and religious leaders were entrusted with the capability to resolve disputes (Rahmat et al., 2022; Shamir, 2016). With a focus on *adat* (tradition in Malay societies) and Confucian values of yielding and compromise, conciliation and mediation are the traditional dispute resolution processes of various races in Malaysia (Fiadjoe, 2004). It is usually applied in various disputes of civil nature, such as family disputes among Muslims known as *Sulh* and non-Muslims (Rahmat et al., 2022).

The Malaysian government has also been actively promoting ADR, especially mediation among its people. These can be seen from the introduction of the Covid-19 Mediation Centre (The Malaysian Reserve, 2022) as well as free mediation services via court-annexed mediation initiated in 2010 and currently practised by courts in Malaysia (Choy et al., 2016).

Nonetheless, several studies found that the awareness level among the general public still leaves much to be desired (Muhammad & Hamid, 2015; Stoilkovska et al., 2015). According to Abraham (2021), although formal mediation has been introduced for the past two decades, it has only been utilised recently in Malaysia for the past decade. One such study in Malaysia's context by Muhammad and Hamid (2015) investigating the public's awareness of the existence of Dispute Resolution Department (DRD) established by the Internal Revenue Board Malaysia to help to solve tax disagreements after eight months of DRD's establishment revealed that although 52% of the respondents knew of its existence, less than 20% of the respondents understood DRD's background, function and objectives.

Additionally, there is a paucity of literature about ADR in developing countries such as Malaysia with most literature coming from the United States of America, Japan, Singapore, Korea and China (Ahmad et al., 2022). According to Hartmann-Piraudeau (2022), a German author and active mediator, although the use of mediation was widespread, the research about its impact was still in its infancy. Not much empirical evidence can be gleaned about Malaysians' perspectives on using ADR to solve disputes. For instance, when it comes to community mediation in Malaysia, Ahmad et al. (2022) concurred that only a little evidence could be obtained. Despite the various promotional efforts by the Malaysian government of ADR as the new paradigm to resolve disputes, the extent to which it translates to greater awareness and positive perception of ADR still remains largely unknown. With this in mind, this study aimed to investigate the current awareness and perception level of ADR in Malaysia. The following sections of the paper present the literature review and research methodology. They are followed by the results and a discussion of the implications.

2. Literature review

2.1 Overview of ADR

ADR refers to dispute resolution techniques out of the judicial process typically consisting of arbitration, mediation and conciliation (Gabuthy and Lambert 2013; Mnookin, 1998;). ADR

techniques attempt to solve disputes in a non-confrontational manner; ranging from party-to-party engagement in negotiation to reach a mutually acceptable solution; to arbitration and adjudication where solution is decided by an external party (Shamir, 2016).

These mechanisms are commonly used in developed countries for most types of disputes (Gabuthy and Lambert, 2013). The ADR “movement” began in the United States in the 1970s arising from the need to find more efficient and effective options to litigation and had since gained traction worldwide because it has been proven to be a better option to resolve disputes (Shamir, 2016). Countries pioneering this field include Canada, New Zealand, Australia, and the United Kingdom, and ADR has become institutionalised as part of many courts and justice systems worldwide in recent years (Shamir, 2016). Arbitration, sharing procedural and practice similarities with litigation, was the first ADR method to gain acceptance, but as ADR undergoes further development, mediation has gained wider and greater acceptance due to its flexible and less informal processes (Shamir, 2016).

Conflict is defined as acute disagreement, a clash of ideas, values and interests (Fiadjoe, 2004). According to Fiadjoe (2004), while conflict is inevitable, the same might not apply to disputes, as disputes arise due to our inability to manage conflicts properly. ADR’s popularity could be caused by the increasing load of court cases (Gabuthy and Lambert 2013). According to Yong (2023), Malaysia registered a total of 519 cases in the Federal Court, 6,307 in the Court of Appeal, and more than 15,000 in the High Court and subordinate courts in 2022 alone. Fiadjoe (2004) asserted that the public’s dissatisfaction with litigation in the form of complaints about increasing costs, delays, bureaucratic procedures and court overload had contributed to ADR’s traction. Furthermore, other complaints include being alienated from decision-making once a lawyer is engaged, total control loss of claim after handing it over to a lawyer, and fear of the adjudicative process formality. Furthermore, ADR emphasises early dispute settlements which can bring financial and emotional benefits to both parties (Fiadjoe 2004), often resulting in the ability to maintain and repair the relationship between parties in disputes (Hartmann-Piraudeau, 2022).

According to The Sun Daily (2016), there was an increasing trend in the number of cases being solved via ADR, especially mediation, since the introduction of the Practice Direction on Mediation in 2010. Kuala Lumpur Regional Centre for Arbitration (KLRCA) showed a marked increase over the past years by having registered 1,260 cases between 2010 and 2016 (The Sun Daily, 2016). KLRCA is now rebranded Asian International Arbitration Centre (AIAC) and continues to act as an independent and neutral venue for arbitration and other ADR proceedings locally and internationally (Asian International Arbitration Centre, n.d.). Other than AIAC, Malaysia International Mediation Centre (MIMC), formerly known as Malaysian Mediation Centre (MMC) is a body established under the auspices of the Bar Council of Malaysia on 5th November 1999 offering mediation services to the public to promote mediation as an ADR process (Kamaruddin and Shawkat, 2021; Malaysian International Mediation Centre, 2016). MIMC’s panel of mediators consists of accredited mediators made up of lawyers and other professionals who have completed a 40-hour mediation skills training workshop by the Bar Council or other recognised bodies (Choy et al., 2016).

The newly elected government of Malaysia under the leadership of Prime Minister Anwar Ibrahim introduced the concept of *Malaysia Madani*, or the Civil Malaysia slogan in January 2023 (CNA, 2023). The word Madani, an acronym consisting of six core values, namely sustainability, prosperity, innovation, respect, trust and compassion, is about reforming Malaysia into a country that believes in humanity and prioritises people’s needs with a fair and effective government (CNA, 2023). The practice of ADR, particularly the use of mediation to solve disputes, befits the notion of the new Malaysian government’s emphasis on humanity and equality in Malaysia’s

multi-racial and diverse society. This study focuses on three forms of ADR, namely adjudication of construction matters, arbitration and mediation which are most common in Malaysia (Arun et al., 2023).

2.2 Adjudication

Adjudication is an involuntary process, as it can be ordered by a court to force a defendant to participate in the process or else, suffer the consequences of a default judgment (Shamir, 2016). The adjudication process is open to the public with the judge, a neutral third party appointed by the state, having the power and responsibility to preside and decide on the dispute (Shamir, 2016). The trial judge's decisions are binding on the parties, subject to appeal to a higher court (Shamir, 2016).

2.2.1 Malaysia's Construction Industry Payment and Adjudication Act 2012 (CIPAA)

Malaysia has a long history of payment disputes in the construction industry with approximately 50% of construction projects experiencing payment issues, leading to a delay or abandonment in the completion of construction projects (CIPAA, 2021). According to Dato' Lim Chong Fong, a Court of Appeal Judge; in the past, a construction case could have taken at least three years to resolve in court leading to financial distress for many unpaid contractors and sub-contractors, but the situation has improved via the existence of a cheaper and faster 100-working-day procedure following the establishment of specialist construction courts in 2013 and CIPAA 2012 (CIPAA, 2021; Yong, 2023).

The purpose of CIPAA 2012 is to facilitate regular and timely payment, provide a process for faster dispute resolution through adjudication, offer remedies for payment recovery in the construction industry and address related and incidental issues (Asian International Arbitration Centre, n.d.). It is a "pay first and argue later" procedure with the CIPAA adjudication decision being binding and enforceable but not necessarily final in the sense that it could be resolved in arbitration or specialist construction courts (Yong, 2023). According to statistics, 75% of the roughly 800 construction disputes that are submitted each year are settled by statutory adjudication (Yong, 2023).

2.3 Arbitration

According to Shamir (2016), arbitration was the first ADR method to gain acceptance because many of its practices and procedures are similar to the judicial system. Arbitration is a part of commercial life. Arbitration involves a private and neutral third party (unlike a judge) who is likely to have expertise in the area of dispute, to arbitrate in a dispute (Fiadjoe, 2004). The dispute will only become a binding arbitration upon the agreement of both disputing parties whereby the arbitration procedures are set by both parties in their arbitration agreement. The arbitrator may deliver a principled decision and announce an award without providing any explanation (Fiadjoe, 2004). Still, it offers advantages relative to adjudication, in the sense that parties can choose their arbitrator and it is quicker as the procedures are less informal (Fiadjoe, 2004).

2.3.1 Arbitration Act 2005

Malaysia's arbitration legislation has now seen a major overhaul with the passing of the Arbitration Act 2005 (Davidson and Sundra, 2023). The Arbitration Act 2005 serves to reform the law related to reform domestic and international arbitration as well as the recognition and award enforcement (Arbitration Act 2005).

2.4 Mediation

Mediation is confidential, structured, future-oriented procedure, voluntary and open-ended, and the parties to the dispute are empowered to make mutually acceptable, out-of-court decisions regarding the solution (Hartmann-Piraudeau, 2022). Governed by the principles of neutrality, self-determination, voluntariness, and confidentiality, it ultimately has the goal of achieving an amicable resolution of the conflict (Hartmann-Piraudeau, 2022).

According to Shamir (2016), as mediation is a voluntary process between parties in dispute, they can still maintain their relationship after the dispute. In mediation, the focus is on the future, but it does not ignore the past, providing information about the issues and the causes of the conflict (Shamir, 2016). The process itself is informal and therefore offers flexibility to be suited to parties' needs (Hartmann-Piraudeau, 2022). Apart from offering the benefits of being private and confidential, as a mediator is bound not to share any information from one party to another or to outsiders without permission; it is generally faster, less costly (Kamaruddin and Shawkat, 2021) and convenient to both parties compared to litigation as it can be scheduled at a mutually agreed time (Shamir, 2016).

The traditional assumption is that the strongest of the parties in disputes will win (win-lose mentality) as the focus is on the parties' rights based on the culture of rights (Fiadjoe, 2004), but mediation is a process that focuses on the interests of both parties (Hartmann-Piraudeau, 2022). Ahmad et al. (2022) asserted that the use of litigation does not address the emotional aspects of disputants especially when it comes to family and neighbourhood disputes involving sensitive and emotional issues. Hence, even though a conflict may lead to a major dispute in the future, there is also a possibility of creative cooperation if both parties jointly work to go for a win-win solution with the assistance of an impartial mediator (Hartmann-Piraudeau, 2022; Shamir, 2016). As a result, mediation has proven to be useful in a variety of conflicts encompassing family disputes (Rahmat et al., 2022), business organisations such as conflicts between business partners, organisational disputes such as labour relations, environmental conflicts, community or neighbourhood conflicts, and victim-offender mediation (Ahmad et al., 2022).

According to former Chief Justice Tun Zaki Azmi (The Sun Daily, 2016), the growth of mediation could be due to the legal systems in many developed countries advocating mediation as a cheaper and quicker option to litigation, hence helping to reduce the backlog or burden of court cases. Along the same lines, Sobri (2021) stated that mediation is getting popular since the introduction of the Mediation Act 2012 which serves to regulate the practice.

2.4.1 Malaysia Mediation Act 2012

Malaysian Mediation Act 2012 is "an act to promote and encourage mediation as a method of ADR by providing for the process of mediation, thereby facilitating the parties in dispute to settle disputes in a fair, speedy and cost-effective manner and to provide for related matters" (Mediation Act 2012, 2012). Section 3 of the Malaysian Mediation Act defines mediation as a voluntary act with the mediator acting as a facilitator of communication and negotiation between the parties in dispute to help them to reach an agreement to the dispute (Mediation Act 2012, 2012).

2.4.2 Community mediation in Malaysia

Mediation has long been practised in the past in Malaysia before the introduction of English common law (Khan, 2013). Back in the olden days, the role of a mediator was carried out by respected elders such as "*penghulu*" or "*Ketua Kampung*" (village head leader), or religious figures

such as “*imam*” (Islam religious leaders) (Ahmad et al., 2022, Khan, 2013). When the Indians and Chinese immigrants came to Malaya, they brought along their customs and practices which among others include the process of resolving disputes through mediation by the elders in the community (Ahmad et al., 2022). According to Khan (2013), the practice of *Sulh* (meaning to cut off dispute) in the Malay community can be traced back to Islamic religious teachings and had been practised in Malaysia since the Malacca Sultanate.

The Government of Malaysia’s concern for the country’s independence was to establish a strong identity and unity among the multi-racial and multi-ethnic citizens, which is crucial, especially since the incident of an interracial conflict on May 13, 1969 (Ahmad et al., 2022). In this respect, the Department of National Unity and Integrity (DNUI) was established in 1969 to ensure a peaceful, harmonious and integrated society; eventually, the *Rukun Tetangga* (RT or Peaceful Neighbour) programme was introduced in 1975 to ensure united multi-racial citizens in Malaysia (Ahmad et al., 2021; Khan, 2013). RT is a voluntary programme regulated by the Malaysian government and intended to create neighbourhood organisation made up of residents in particular residential areas around the country. The power and authority of RT were vested by the Peaceful Neighbour Regulation 1975 (Ahmad et al., 2022).

As part of DNUI’s effort to promote peace in the community, it has initiated a variety of programmes such as the Community Mediation pilot project in 2008 to train RT Committee (community mediators) responsible to help residents in their neighbourhood to resolve disputes free of charge (2012, 2013). The programme was first piloted in Selangor, Penang, Johor, and the Federal Territory of Kuala Lumpur in 2007 and was extended to other states in Malaysia in 2008 (Khan, 2013). According to Ahmad et al. (2022), there are 1000 trained community mediators registered with the DNUI in their respective residences.

Mediation is usually used in civil disputes (Rahmat et al., 2022). Today, mediation has also been extended to matrimonial and household disputes (Ahmad et al., 2022). According to Mohamad Bahri et al. (2023), Malaysian public universities have also taken the initiative to implement the ombudsman concept to solve conflict among stakeholders and promote good governance, with Universiti Sains Malaysia (USM) being the first to establish an Ombudsman Office in 2011.

2.4.3 Pro-Bono mediation

The growth of the mediation movement in Malaysia could be witnessed in the Malaysian government’s efforts to provide pro bono (without charge) mediation. To assist Malaysians in solving contractual obligations due to the Movement Control Order (MCO), the Malaysian government established the Covid-19 Mediation Centre under the Temporary Measures for Reducing the Impact of the 2019 Coronavirus Disease Act 2020 (Act 829) to assist the public to resolve their disputes resulting from an inability to perform contractual obligation not exceeding RM500,000 in a good manner without having to go to court (The Malaysian Reserve, 2022).

PMC-19 received a total referral of 290 cases out of which 79 cases were resolved with a cumulative dispute value of RM3.8 million (The Malaysian Reserve, 2022). Although PMC-19 was officially closed on 23rd October 2022 (The Malaysian Reserve, 2022), it was nevertheless still a good initiative by the Malaysian government to alleviate the suffering of the people. Today, there are a few organisations offering pro bono mediation services such as the AIAC Pro Bono Mediation Initiative (Asian International Arbitration Centre, 2023).

2.4.4 Court-Annexed mediation

The Malaysian judiciary introduced a free-of-charge, court-annexed mediation using judges as mediators in August 2011, aimed at encouraging litigating parties to mediate a solution to their disputes as an option to clear a backlog of court cases (Choy et al., 2016). However, court-annexed mediation is more formalised as the mediators consist of active judges and judicial officers act as mediators after litigating parties filed for action in court (Choy et al., 2016). With the establishment of the Court-Annexed Mediation Centre Kuala Lumpur, a 40% settlement rate of cases was reported between 2011 to 2013, alongside a rise in cases received during those years (Choy et al., 2016). Following its success, mediation centres had been set up in Kuala Lumpur, Kota Kinabalu, Kuching, Johor Baharu, Muar, Kuantan and Ipoh (Khan, 2013).

Table 1 presents a comparison between adjudication, arbitration and mediation as ADR options. Out of the three, mediation could be more advantageous by offering benefits such as voluntariness, privacy, empowerment and mutually acceptable solutions, resulting in a greater likelihood of a win-win solution for disputing parties (Mnookin, 1998; Shamir, 2016). This could lead to mediation being a more prevalent ADR form (Rahmat et al., 2022).

3. Research methodology

A quantitative research method was employed. A questionnaire containing two sections were purposely designed for the study's specific context. Section A of the questionnaire solicited responses about the demographic profile of the respondents, while Section B contained questions about the respondents' awareness and perception of ADR in Malaysia.

The questionnaire was administered to the first batch of course participants of the inaugural course offered in April and May 2023 in USM, Penang to solicit their views about awareness and perception of ADR in Malaysia. The questionnaires were distributed to the participants on the second last day of the 40-hour course with permission from the organisers. The course contents provided an overview of ADR, but the contents were focused mainly on the principles and practice of mediation. Hence, accordingly to the course syllabus, the questions covered an overview of ADR, but were targeted more towards mediation.

The Professional Certificate in Alternative Dispute Resolution Practice is jointly offered by Advance Dispute Resolution Centre (ADRC) and USM (Yong, 2023). ADRC is a non-profit organisation founded under the auspices of Penang Muhibbah Consultative Goodwill Council (*Majlis Perundingan Muhibbah Negeri Pulau Pinang* or in short, "MPMNPP" in Bahasa Malaysia) to train the right people with the right calibre to undertake the training of future ADR practitioners to resolve societal disputes (Yong, 2023), similar to the principle of community mediation. In this sense, ADRC conducted an initial screening of the participants to determine suitability in terms of their work experience and education background to ensure their suitability to undertake the tasks. To ensure an effective course delivery, it also engaged a co-trainer from DNUI. A total of 26 participants out of a total 40 participants returned the questionnaire, resulting in a response rate of 65%. Data was analysed using Microsoft Excel. According to Hertzog (2008), a small sample size of between 20 to 30 respondents is adequate for an exploratory study.

Table 1: Differences between Adjudication, Arbitration and Mediation

Differences	Adjudication	Arbitration	Mediation
Voluntariness	No. It can be ordered by the court (Mnookin, 1998).	A process wherein parties to the dispute agree to submit their dispute to a neutral party, who will decide their case (Shamir 2016).	Voluntary process (Mnookin, 1998; Shamir, 2016:)
Confidentiality of the process	Proceedings are open to the public (Mnookin, 1998).	Private and less formal process than litigation in court (Shamir 2016).	The process is neutral, private and conducted in a safe environment (not open to the public) - matters revealed in mediation may not be raised in other proceedings (Kamaruddin and Shawkat, 2021).
Nature of process	Formal (Shamir 2016).	Formal. Usually involves commercial contracts, labour agreements and joint venture agreements (Shamir 2016).	Informal (Mnookin, 1998)
Role	The adjudicator is a judge, a neutral third party appointed by the state possessing the power to run the proceedings and resolve the dispute (Mnookin, 1998). The adjudicator could also be a third party appointed by a judge (Shamir, 2016)	An arbitrator is a private person and neutral third party chosen by the parties in dispute (Mnookin, 1998) who usually has expertise in the dispute's subject matter (Mnookin, 1998). For instance, professionals such as accountants or engineers (Shamir 2016).	A mediator acts more as a facilitator and has no authority to impose decisions on the parties, designs the process to assist the parties to get to the root of their conflict, to understand their interests, and reach a mutually acceptable and amicable solution (Shamir, 2016), using skills such as re-framing, active listening, analytical and open-ended questioning skills at hand (Hartmann-Piraudeau, 2022).
Who makes decisions	Adjudicator (Shamir 2016).	Arbitrator (Shamir 2016).	Mutually accepted solutions by disputing parties who own it and are responsible for implementing it. The agreement is validated and ratified by the courts (Shamir, 2016).
Binding decision	Binding, subject to appeal to a higher court (Mnookin, 1998)	The decision may be binding or non-binding (depending on a prior decision and local laws) and the arbitrator's decision may be with or without a written explanation or opinion (Shamir, 2016). When binding, appeal to a higher court is not allowed. (Shamir, 2016).	A settlement agreement is not ordinarily subject to judicial review and can be enforced as a contract (Shamir, 2016).
Who makes decision? Outcome	The adjudicator (Mnookin, 1998) Usually a win-lose situation (Shamir, 2016)	The arbitrator (Mnookin, 1998). Similar, closest to adjudication (Shamir, 2016)	The parties in dispute themselves (Mnookin, 1998) Might result in a win-win solution (Hartmann-Piraudeau, 2022)

Source: Hartmann-Piraudeau (2022), Mnookin (1998), Shamir (2016)

4. Results

4.1 Demographic characteristics of the participants

The respondents were well represented in terms of gender with 58% males and 42% females. Age-wise, 50% were under the 40 to 49 years old, with only 8% between 20 to 39 years old, and 19% for groups both between 30 to 39 years old and between 40 to 49 years old. Only 4% are over 60 years old.

A large majority of the respondents had substantial working experience and held senior positions in their organisations. In terms of current working positions, 19% were directors. The rest consisted of senior managers (15%), managers (19%), senior executives (12%), junior executives (8%) and professional groups such as lawyers (27%). 38% possessed a total working experience between 21 to 30 years, followed by 23% between 11 to 20 years, 19% more than 30 years, 12% between 6 to 10 years and 8% between 0 to 5 years. All the participants who participated in the survey were based in Penang.

The respondents came from various industries. Those from the services industry made up the bulk of the participants at 53%. The others worked in manufacturing (19%), education (12%), construction (8%), finance (4%) and industry such as mining, water and electricity (4%).

However, only 15% of the respondents had prior experience in ADR. Only 12% were active in ADR practice. 19% reported that their current employers were active in ADR usage. A deeper analysis revealed those respondents who answered ‘yes’ to these three questions worked in the legal profession.

4.2 Respondents’ awareness and perception of ADR

The findings indicate that the level of awareness of ADR availability among the respondents before enrolling in the course was quite high at 73%, as can be seen from Table 2. This is a positive sign as knowledge of ADR’s existence is crucial to encourage its usage. However, this could be attributed to their specific background being from a select group of candidates with a keen interest in ADR.

Table 2: Results on respondents’ awareness of ADR’s availability before enrolling in the ADRC-USM Professional Certificate in ADR Practice course.

	Respondents	Percentage
Completely disagree	0	0.00
Moderately disagree	5	19.23
Somewhat disagree	2	7.69
Somewhat agree	3	11.54
Moderately agree	7	26.92
Completely agree	9	34.62
Total	26	100.00

Generally, among the three ADR methods, the awareness level of mediation was the highest at 69% as can be seen from the number of respondents indicating their agreement, followed by adjudication at 54% and arbitration at 50% (refer to Table 3). This shows that the relevant bodies have done a good job in promoting ADR, especially mediation, to the public.

Table 3: Results on respondents' awareness of the existence of the following ADR methods before enrolling in the ADRC-USM Professional Certificate in ADR Practice course

	Adjudication		Arbitration		Mediation	
	Respondents	Percentage	Respondents	Percentage	Respondents	Percentage
Completely disagree	3	11.54	3	11.54	2	7.69
Moderately disagree	3	11.54	2	7.69	3	11.54
Somewhat disagree	5	19.23	4	15.38	3	11.54
Somewhat agree	1	3.85	1	3.85	3	11.54
Moderately agree	8	30.77	8	30.77	6	23.08
Completely agree	6	23.08	8	30.77	9	34.62
Total	100.00	100.00	26	100.00	26	100.00

As for the awareness of prevailing laws governing the use of ADR (refer to Table 4), the highest level of awareness was recorded at 65% for the mediation act as indicated by agreement level, followed by 62% for the arbitration act and lastly, 54% for adjudication act. A possible reason for the lower awareness of the adjudication act could be attributed to its specificity of application in the construction industry. Hence, only those participants who were from the construction or legal industry could be knowledgeable of its existence.

Table 4: Results on respondents' awareness of the existence of the following laws of Malaysia governing ADR practice before enrolling in the ADRC-USM Professional Certificate in ADR Practice course

	Construction Industry					
	Payment and Adjudication Act 2012		The Arbitration Act 2005		Mediation Act 2012	
	Respondents	Percentage	Respondents	Percentage	Respondents	Percentage
Completely disagree	3	11.54	3	11.54	3	11.54
Moderately disagree	6	23.08	4	15.38	4	15.38
Somewhat disagree	5	19.23	3	11.54	2	7.69
Somewhat agree	6	23.08	2	7.69	4	15.38
Moderately agree	3	11.54	5	19.23	4	15.38
Completely agree	5	19.23	9	34.62	9	34.62
Total	26	100.00	26	100.00	26	100.00

Table 5 shows that 62% of the respondents indicated awareness of court-annexed mediation in Malaysia. This proves that the Malaysian government's efforts to promote compulsory mediation to solve court cases are bearing positive fruits. 54% of the respondents were aware that pro-bono mediation services exist in Malaysia. However, this could be due to 23% of the participants were involved in legal responsibilities as part of their profession.

Table 5: Results on respondents' awareness of the existence of court-annexed mediation and pro-bono mediation in Malaysia

	Court-annexed mediation in Malaysia		Pro-bono mediation in Malaysia	
	Respondents	Percentage	Respondents	Percentage
Completely Disagree	3	11.54	3	11.54
Moderately Disagree	2	7.69	3	11.54
Somewhat Disagree	5	19.23	6	23.08
Somewhat agree	6	23.08	5	19.23
Moderately agree	2	7.69	2	7.69
Completely agree	8	30.77	7	26.92
Total	26	100.00	26	100.00

However, only 47% of the respondents opined that there was an active usage of ADR methods to solve disputes in Malaysia (see Table 6). More than half of them believed otherwise. Only 46% agreed that mediation method to solve disputes were adequately utilised in Malaysia. A large percentage of the respondents, namely 69% also believed that the public was not generally aware of ADR methods in solving disputes.

Table 6: Results on respondents' perception of whether ADR methods are actively used to resolve conflicts in Malaysia, mediation as an ADR method in solving issues is sufficiently utilised in Malaysia and whether as a whole, the general public is aware of the ADR methods in solving disputes instead of pursuing litigation

	ADR methods are actively used to resolve conflicts in Malaysia.		Mediation as an ADR method in solving issues is sufficiently utilised in Malaysia		As a whole, the general public is aware of the ADR methods in solving disputes, instead of pursuing litigation.	
	Respondents	Percentage	Respondents	Percentage	Respondents	Percentage
Completely disagree	1	3.85	2	7.69	3	11.54
Moderately disagree	4	15.38	8	30.77	8	30.77
Somewhat disagree	9	34.62	4	15.38	7	26.92
Somewhat agree	7	26.92	5	19.23	4	15.38
Moderately agree	3	11.54	4	15.38	4	15.38
Completely agree	2	7.69	3	11.54	0	0
Total	26	100.00	26	100.00	26	100.00

Generally, a majority of the participants thought that the awareness level for mediation in Malaysia was still rather low, with 54% and 8% rated it as low and very low respectively (see Table 7).

Table 7: Results on respondents' grading of awareness level for mediation in Malaysia

	Respondents	Percentage
Very high	0	0.00
High	3	11.54
Medium	7	26.92
Low	14	53.85
Total	26	100.00

As can be seen in Table 8, most of the respondents agreed that mediation offered various benefits. However, there were varying opinions on the certainty of a claim resulting from using mediation, with 38% disagreeing to a certain extent.

Table 8: Results on respondents' opinions about the benefits of using mediation to solve disputes

	Faster processing time		Cost-saving		No need to go to court		Certainty in claim		Maintaining the relationship between disputing parties	
	No.	%	No.	%	No.	%	No.	%	No.	%
Completely disagree	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Moderately disagree	0	0.00	0	0.00	0	0.00	4	15.38	0	0.00
Somewhat disagree	0	0.00	0	0.00	0	0.00	6	23.08	0	0.00
Somewhat agree	1	3.85	1	3.85	2	7.69	7	26.92	1	3.85
Moderately agree	1	3.85	10	38.46	6	23.08	4	15.38	11	42.31
Completely agree	14	53.85	15	53.85	18	69.23	5	19.23	14	53.85
Total	26	100.00	26	100.00	26	100.00	26	100.00	26	100.00

Table 9 reports on the respondents’ opinions of the activities which could be done to promote the public’s awareness of mediation. The usage of media campaigns and positive examples solved by mediation solution tied at first place at 73%, followed by a tie between institutional support for mediation and mediation workshops at 65%.

Table 9: Results on respondents’ opinion of activities which should be taken to raise awareness of the general public about mediation and their confidence in it

	Media campaigns	Institutional support for mediation	Benefits from mediation in time and finances	Positive examples solved by mediation solution	Mediation workshops
Responses	19	17	11	19	17
Percentage	73.08	65.38	42.31	73.08	65.38

5. Discussion and recommendation

The results indicated that a majority of the respondents were aware of ADR’s existence before the course enrolment. This is a positive finding but could be attributed to the fact that the respondents were a select group of experienced and educated knowledge workers. On the contrary, more than two thirds of the respondents believed that the general public’s awareness level of ADR options in solving disputes was low. Less than half of them agreed that the mediation method to solve disputes was adequately utilised in Malaysia. This concurs with Muhammad & Hamid’s (2015) study on awareness about DRD of IRB Malaysia that only half of the respondents surveyed were aware of its existence. Similarly, Stoilkovska et al.’s (2015) study based in Macedonia also found that the population had a lack of information about mediation and its benefits.

As adjudication and arbitration are usually deployed for commercial disputes, the processes are more formal and complicated. Hence, the most important stakeholder here is the government, who should play a leading role in working together with the relevant professions and judiciary to promote ADR and advise on the available options. In line with the efforts to make Malaysia an arbitration-friendly region, more empowered arbitration centres could be made available across the nation to ensure greater public accessibility and prevent a backlog of cases. AIAC, being the leading arbitration institution in Malaysia, is empowered to set its own arbitration rules (Yap and Saw, 2023). In line with this development, the Malaysian government is on the right track to set up the first arbitration centre in East Malaysia, called the Borneo International Centre for Arbitration and Mediation (BICAM) in 2023, covering Sabah, Sarawak and the Federal Territory of Labuan (Yap and Saw, 2023).

For disputes of civil nature involving community issues, ADR bodies could tie up with state assemblymen’s local service centres which serve as an avenue for the public to voice their grievances and seek advice. In this sense, these local assemblymen should be equipped with knowledge on ADR options such as arbitration, adjudication and mediation so that they could provide the correct advice to the public accordingly. Their service centres could even be turned into community mediation centre providing an avenue to solve the community’s non-commercial disputes. Additionally, ADR bodies could target the Human Resource (HR) departments of organisations to offer compulsory ADR training course for HR practitioners. For instance, it might be a practical option to make HR practitioners to be experts in mediation practice to solve internal organisational conflicts of non-commercial nature. As for commercial disputes, the HR practitioners should also be equipped with proper knowledge about ADR options so that they could advise the top management about less adversarial options instead of litigation.

Pertaining to the usage of adjudication as an ADR method, The Malaysian Lawyer (2018) suggested that the adjudication process to be streamlined. Although there has been a recorded increase in adjudication cases, but backlog arises due to the lengthy time it takes to solve the cases. According to The Malaysian Lawyer (2018), although CIPAA was meant to assist lay persons so that they can be self-represented in the adjudication proceedings, the process has become so complicated with the direct involvement of legal practitioners. This deters small industry players which see no difference between adjudication and litigation. Hence, a creative solution might lie in a decentralised online process in today's digital era, namely online dispute resolution (ODR). ODR is a sub-set of ADR which uses innovative digital means or platforms for litigants to solve disputes, which widens the public's access to justice (Rule, 2020). However, ODR would be feasible when supported by strong mechanisms in place for ruling enforcement purposes as it was not supported by institutional arrangement such as the power of the courts (Ast & Defains, 2020).

The use of blockchain technology might be useful in inspiring the public's trust in an ODR judiciary system via mathematical algorithm and a decentralised justice system (Ast & Defains, 2020). It was suggested that a dispute resolution system must meet three criteria to qualify as a decentralised justice system, namely perception of fairness, built as decentralised autonomous organisation and designed based on cryptoeconomic incentives (Ast & Defains, 2020). Members can participate in decision-making via a voting system as in a democratic government system, with the entire ADR process from handling evidence to ruling execution being fully automated with the help of blockchain technology, ensuring that it is free from the control of a single agent (Ast & Defains, 2020).

To promote greater awareness of mediation, Muhammad and Hamid (2015) suggested that more information such as statistical publication of successful cases solved by mediation should be put up on relevant websites to disseminate information about the availability of ADR options to the public. Similarly, most of the respondents in this research agreed that more media campaigns and examples of cases solved by mediation solutions should be made available to Malaysians from all walks of life. More intensive media campaigns highlighting the benefits of mediation should be carried out on a long-term basis. Conveying its benefits such as being less adversarial, more cost-effective and speedier than litigation could convince the public to opt for mediation to solve their disputes. Furthermore, the Council of Europe (2023) suggested promoting customised materials for different target groups such as draft practical handbook on mediation and arbitration prepared for mediators and lawyers; guidebooks on mediation and arbitration for judges, court staff and lawyers; and public information leaflets, posters, public service announcements and videos for the public to raise awareness and support effective implementation on mediation and arbitration mechanisms. The distribution channels include meetings, information desks, mediation bureau and in digital form to be accessible by wider set of audience (Council of Europe, 2023).

In essence, to increase the usage of ADR, knowledge of such options is most crucial to ensure a higher utilisation rate. A more coherent, standardised and continuous promotion efforts from all relevant private and public ADR bodies in Malaysia will ensure a greater success of its adoption. Rahmat et al. (2022) suggested that Malaysia could also study how other countries utilise publicity methods to promote ADR. For instance, to educate and increase the public's understanding of the mediation process and educate them that disputants had the freedom to choose the solutions to their disputes, China utilised an innovative method via a television reality show called Gold Medal Mediation (Zhang & Chen, 2017).

The public should also be informed about the competency of the mediators in terms of the training and skills to handle disputes needed to become a qualified mediator, to increase general confidence in reliability of mediation (Stoilkovska et al., 2015). According to Choy et al. (2016), the training programme for mediators should focus on the development of three competencies encompassing knowledge (for example, negotiation theory, mediation strategies, tactics, and processes in both negotiation and mediation), skills (for example, listening, analytical and questioning), and attitude (ethics, values and professionalism). Attention should be given to intercultural training as well given that Malaysia is a multi-racial country.

Institutional support for mediation plays an important role. The Malaysian government and relevant ADR bodies such as AIAC and MIMC should strive to provide resources such as mediation services and training workshops to the public. Clearer guidelines should be provided to increase the public's confidence about the reliability of the ADR process (Choy et al., 2016).

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Issues and Perspectives in Business and Social Sciences

Determinants of consumers' intention to purchase and switch to products of bio-waste: Potential support for a closed-loop supply chain

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Abstract

The impact of urbanisation and increasing number of populations have become major factors that lead to negative impact toward the environment. Although waste management has been practiced by most of the marketers, the problem of waste is still not well-managed. Therefore, this study is conducted with the aim to examine the impacts of consumers' perception towards products of bio-waste and to understand consumers' purchasing behaviour. The paper adopted multiple regression analysis in investigating consumers' perception towards bio-waste products and consumers' purchasing behaviour variables. The self-administered surveys were randomly disseminated to Penang consumers, where 99 responses were collected. The result shows a positive relationship between consumers' perception towards bio-waste and purchase behaviour variables, which is consistent with the theory of planned behaviour. Thus, this study caters several implications and recommendations to the scholars, industrial practitioners and policymakers regarding consumers' perception and purchasing behaviour towards bio-waste products.

Keywords:

bio-waste products;
consumers' purchasing
behaviour;
supply chain;
Penang.

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1. Introduction

In today's world, the topic of "environmentally friendly" is fervently discussed, but the actual practices of waste management and consumption remain isolated (Vela et al., 2022). From the evidence of Chen et al. (2018), it could be concluded that the system of waste management in Malaysia are deficient and unable to cope with the production of biodegradable and non-biodegradable waste. This reflects the cruciality of promoting awareness of the society with the purpose of reducing and preventing waste through integrating in Closed-loop Supply Chain. Many industries have begun to implement waste management for the purpose of strengthening their competitive advantages in the market. One of the most common strategies adopted by industries for managing their waste and maintaining sustainability is through adoption of Closed-loop

Supply Chain (Jain et al., 2022). Meanwhile, an action plan, namely National Solid Waste Management Policy, has been introduced to support the chain through the application of the 3Ps principle which refers to reducing, reusing, and recycling waste.

Malaysia has insufficient waste management system to deal with the volume of waste production. National statistics have shown that, the production of waste in Malaysia escalated 8.5% annually from 2015 until 2019, with total production of 4013.2 tons of waste in the year 2019 (Baharudin, 2022). Thus, the increase of waste production has urged the country to revolutionise its waste management system in reducing the destruction of the ecosystems and human health.

Besides, many industries may face difficulties and limited capabilities to perform and manage waste (Ferronato and Torretta, 2019). In Malaysia, the industries that produced the most waste in 2019 are attributed to the power plants, metal refinery, chemical industry and electric and electronic, which contributed 24.2 percent, 12.2 percent, 10.7 percent, and 10.1 percent of wastes respectively (Baharudin, 2022). Within these industries, wastes are generated from faulty products in production sites, as well as unwanted, expired, or obsolete products.

Bio-wastes, for example, food waste, paper waste, and many more, are biodegradable and made of safe substances. Several research studies proved that bio-wastes are commonly contributed by individual households, and it is essential to be overcome (Hanc et al., 2011). According to the literature, there is insufficient evidence to conclude consumer acceptance towards products of bio-waste (Osburg et al., 2016). Since consumers' intention to purchase might be influenced by their perceptions of bio-waste products, alongside various external factors, the lack of understanding has further prevented logistics industries and business practitioners from evaluating the viability of implementing closed-loop supply chain and waste re-production (Ramya and Ali, 2016). Hence, the following core research questions are developed:

- RQ1: What is the relationship of product involvement with intention to purchase bio-waste products?
- RQ2: What is the relationship of green identity with intention to purchase bio-waste products?
- RQ3: What is the relationship of subjective norms with intention to purchase bio-waste products?
- RQ4: What is the relationship of product involvement with intention to switch to bio-waste products?
- RQ5: What is the relationship of green identity with intention to switch to bio-waste products?
- RQ6: What is the relationship of subjective norms with intention to switch to bio-waste products.

2. Literature review

Supply Chain Management is the management of the entire value chain that focuses on production flow of goods and services from the movement of raw materials to the end consumers (Ellis and Santagate, 2018). Due to the increasing expectation of end consumers for their desired goods and services, the sellers must enhance the overall products' standard to remain competitive and sustainable in the global market. Hence, supply chain management plays an important role to integrate in the supply chain effectively and ensure the business objectives are coupled with the mandatory safety procedures (Carmignani, 2009). Thus, the Theory of Planned Behaviour (TPB) is introduced to underpin consumers' perceptions over intention to purchase and intention to switch for their desire goods and services. TPB is an extended model of the Theory of Reasoned Action and one of the most extensive models for social psychologists to predict behavioural intention (Ajzen 1985). It suggests behaviour is driven by an individual's intentions, which are

influenced by three main factors: attitudes, subjective norms, and perceived behavioural control (Fishbein and Ajzen 1975).

Traditional supply chain management tends to focus on the entire supply chain, which may overlook some detailed problems that could occur in the chain; or lack of expertise to deal with and prevent the problems. Thus, this has led to the need of integrating management approaches such as closed-loop supply chain (CLSC) to overcome and avoid circumstances in the global business market in mitigating the supply chain risks and problems.

2.1 Closed-loop supply chain

CLSC is one of the main management approaches implemented for waste prevention and bullwhip effect elimination (Papanagnou, 2022). It consists of a combination of traditional linear supply chain and reverse loop of supply chain, whereby waste produced in the chain is sent back to the manufacturing sector to be remanufactured and recreate value. A systematic closed-loop supply chain could help both organisation and society to manage the existing environmental constraints generated from the rising population and inappropriate management of wastes (Abdolazimi et al., 2020). Bio-waste has attracted huge attention from the global market, as it could be used by the manufacturer to create a new product life cycle and add value for the waste products (Veolia, 2022). However, there is an uncertainty over the demand of bio-waste products due to consumers' perception, which will be investigated in this report.

2.2 Consumers' purchasing behaviour

2.2.1 Intention to Purchase

Intention to purchase is generally referring to the attitudes or reactions of consumers toward a certain product before the process of purchasing begins, to make sure the products can meet their desires (Al Zubaidi, 2020). The intention to purchase of consumers depend on several reasons, which remains to be further examined (Medeiros et al., 2016). In previous studies, consumers' intention to purchase is commonly examined by studying the underlying factors that affect consumers' attitude towards a product before and during the purchasing process (Sharma and Foropon, 2019).

2.2.2 Intention to switch

Intention to switch simply refers to consumers' purchase behaviour that changes from one product to another, including changing from a previously desired product to another product currently desired (Khoiriyah et al., 2017). Consumers who purchase green products commonly have an intention to switch towards remanufactured products, as these consumers usually hold green self-identity. This switching intention is usually affected by consumers' green behaviour, rather than the market behaviour such as price (Perez-Castillo and Martinez, 2021). Examining intention to switch of consumers could allow the researchers to understand the current consumers' purchasing behaviour and interests towards bio-waste products as well as the reasons for switching to bio-waste products (Chang et al., 2021). For example, product involvement, green self-identity, and subjective norms.

2.3 Perception towards bio-waste products

2.3.1 Product involvement

Product involvement is generally referring to the perceived value and feelings of consumers towards the consumption of a product based on the products' characteristics. For example, dependability, worthiness, and interest (Jaeger et al., 2018). Past studies show that consumers have less interest towards remanufactured products that are made of bio-waste, although it is clean and low costs. This is due to the consumers' belief that the products that are remanufactured from bio-wastes are unhygienic and easily to be damaged (Abbey et al., 2014). This directly reflects that consumers' perceived value could impact their perceptions directly and it is important to be studied. Inevitably, the product involvement for bio-waste products could vary directly according to consumers' green self-identity.

H1: Product involvement significantly affects Intention to Purchase.

H2: Product involvement significantly affects Intention to Switch.

2.3.2 Green self-identity

Green self-identity is generally identified as the identification of consumers with their behaviour towards personal value and environmental-friendly behaviour (Khare and Pandey, 2017). Global and environmental issues have created a significant awareness to the current society, and therefore, more and more consumers are intending to contribute as a part of overcoming these issues. The process of remanufacturing bio-waste could be logically considered as a process of reducing waste and eliminating environmental issues in the current world. According to Ong et al., (2015) who have examined consumers' perception towards green products, the major factor influencing changes in consumers' purchase behaviour is green self-identity instead of prices of products, but the green self-identity. Green self-identity of individual consumers could be generated or affected by external factors such as subjective norms.

H3: Green Self-Identity significantly affects Intention to Purchase.

H4: Green Self-Identity significantly affects Intention to Switch.

2.3.3 Subjective norms

Subjective norms refer to the approval given by a group of people for a particular action being done. In other words, the behavioural and manners of conducting an action is determined by social pressures (Ham et al., 2015). According to past studies, the subjective norm is one of the factors that are well-known to influence consumers' perception toward green products, as it could directly bring changes to the intention to purchase of consumers (Al-Swidi et al., 2014). For example, consumers may worry about being isolated from the current society, if they refuse to purchase bio-waste products. For these reasons, the intention to purchase and switch to bio-waste products increases, as consumers may intend to avoid society biasness (Ko and Jin, 2013).

H5: Subjective norms significantly affect Intention to Purchase.

H6: Subjective norms significantly affect Intention to Switch.

2.4 Research model

By adopting TPB in this research, the study aims to gain a comprehensive understanding of the relationships between customers' intention to purchase and intention to switch for bio-waste products. This research model allows for a deeper analysis of the underlying mechanisms through which customers' perceptions influence customers' intentions towards bio-waste products (Ahmed et al., 2021).

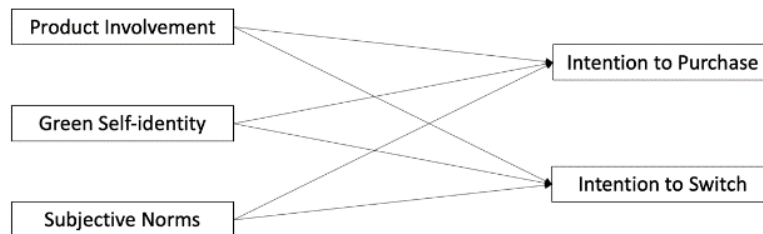


Figure 1: Research model

3. Data, sample and analysis

The research utilised multiple regression quantitative analysis in investigating consumers' perception towards bio-waste products and consumers' purchasing behaviour variables in Penang. Individual consumers formed the unit of analysis for the research. Based on the output of G*Power software, a minimum sample size of 85 is appropriate. It was decided that 200 research questionnaires were to be distributed to provide allowance for non-responses and incomplete responses in order to achieve the minimum (Lakens, 2022). 200 questionnaires were distributed online using Google Form to consumers aged 18 years old and above, as consumers above this age range in Penang are working adults having the capabilities to hold a certain purchasing power. A total of 99 completed questionnaires were returned, forming a response rate of 49.5%, as indicated in Table 1.

Table 1. Demographic Profile

Variables	Categories	Frequency	Percentage
Age	18 – 25	48	48.5
	25 – 34	25	25.3
	35 – 54	21	21.2
	Above 54	5	5.1
Gender	Male	41	41.4
	Female	58	58.6
Education Level	High School	25	25.3
	Undergraduates	47	47.5
	Postgraduates	25	25.3
	Post Doctorate	2	2.0

3.1 Reliability

Cronbach's alpha reliability analysis was performed to ensure the validity and internal reliability of each construct. Generally, Cronbach's alpha values of 0.7 and above are considered consistent and reliable (Ursachi et. al., 2015). Table 2 displays the reliability test for intention to purchase,

intention to switch, product involvement, green self-identity, and subjective norms. All Cronbach's alpha values are above 0.7, indicating validity and reliability of the scale in measuring the intended variables.

Table 2. Reliability Analysis

Variables	Number of items utilised	Cronbach's Alpha
Intention to Purchase (IP)	5	0.95
Intention to Switch (IS)	5	0.95
Product Involvement (PI)	5	0.95
Green Self-Identity (GSI)	5	0.96
Subjective Norm (SN)	3	0.93

3.2 Pearson correlation analysis

Pearson Correlation Analysis was used as a tool for analysing data in this research paper. It was used to inspect the associations and relationship between independent variables and dependent variables. In general, strong correlation is present when the significant value is above 0.75 (Udovicic et al., 2007). Pearson Correlation Analysis is produced and shown in the table below with 1-tailed significant value to ascertain the relationship of variables. In Table 3 below, it shows evidence for significant correlation between independent and dependent variables. Product involvement, green self-identity and subjective norm have a positive relationship with intention to purchase. Among all independent variables, green self-identity has the strongest relationship with intention to purchase ($r = 0.697$). In contrast, product involvement has the weakest relationship with intention to purchase ($r = 0.653$).

Apart from that, all independent variables also have a positive relationship with the intention to switch. Among all independent variables, green self-identity has the strongest relationship with intention to switch ($r = 0.695$), followed by subjective norms ($r = 0.675$). Meanwhile, product involvement is the independent variable that has the weakest relationship with intention to switch ($r = 0.675$).

Table 3. Pearson Correlation Analysis

	EP	IS
PI	0.653**	0.675***
GSI	0.697**	0.695**
SN	0.674**	0.677**

** $p < 0.01$ (one-tailed)

To conclude, all dependent variables have moderate relationships with independent variables as shown in the correlation results. Therefore, further examination would be required for the purpose of indicating whether the variables are having direct or indirect association.

3.3 Multiple regression analysis

Table 4 represents the multiple regression results which tested the influence of product involvement, green self-identity and subjective norms on intention to purchase. It was found that green self-identity is positively related to intention to purchase with $\beta = 0.305$ and $p = 0.042$,

which is significant and supported. On the other hand, product involvement and subjective norms are insignificant factors, with $\beta = 0.158$ and $p = 0.1455$ (PI), $\beta = 0.011$ and $p = 0.055$ (SN). Therefore, H3 is supported and there is no support for H1 and H5.

Table 4. Regression Analysis for Intention to Purchase

Hypotheses	Standardized Beta (β)	t value	p value	Decision
H1: PI \square IP	0.158	1.062	0.1455	Not Supported
H3: GSI \square IP	0.305	1.748	0.042	Supported
H5: SN \square IP	0.011	2.586	0.055	Not Supported

Notes:

** $p^{**} < 0.01$ (one-tailed)

IP = Intention to Purchase; IS = Intention to Switch; PI = Product Involvement; GSI = Green Self-identity; SN = Subjective Norms

Results of multiple regression analysis that tested the influence of product involvement, green self-identity and subjective norm on intention to switch are presented in Table 5. Based on the results, product involvement is positively related to intention to switch with $\beta = 0.265$ and $p = 0.0375$, which is significant. Besides, subjective norms are also positively related to intention to switch with $\beta = 0.322$ and $p = 0.004$, which is highly significant. In contrast, green self-identity was found to be an insignificant factor in relation to intention switch ($\beta = 0.201$ and $p = 0.1235$). Thus, both H2 and H6 are supported and H4 is not supported by the data.

Table 5: Regression Analysis for Intention to Switch

Hypotheses	Standardised Beta (β)	t value	p value	Decision
H2: PI \square IS	0.265	1.800	0.0375	Supported
H4: GSI \square IS	0.201	1.164	0.1235	Not Supported
H6: SN \square IS	0.322	2.695	0.004	Supported

Note:

$p^{**} < 0.01$ (one-tailed)

IP = Intention to Purchase; IS = Intention to Switch; PI = Product Involvement; GSI = Green Self-identity; SN = Subjective Norms

4. Conclusions, practical implications and future research

According to the findings, the relationship between product involvement and intention to purchase is not significant. This is consistent with the findings of Lee et al. (2017) and Mou et al. (2020) as consumers evaluate the product involvement according to their needs, desires, and value (Bian and Moutinho, 2011). In addition, Rahbar and Wahid (2010) proved that consumers who are based in Penang usually purchase green products due to social responsibilities, as they wish to contribute to social welfare.

Moreover, the result indicates that green self-identity significantly and positively influences the intention to purchase products of bio-waste with $\beta = 0.305$ and $p = 0.042$, which is significant. This result is consistent with findings in Ong et al., (2015) and Barbarossa, et. al. (2017). Consumers have higher intention to purchase if they perceive an environmental-friendly identity for being a part of environmental and social contribution (Barbarossa and De Pelsmacker, 2016). Consumers who prioritise the environment and its conservation tend to support products made

of bio-waste. Therefore, this study suggests that green self-identity is a significant factor in driving the purchasing behaviour of consumers in Penang.

On the other hand, the relationship of subjective norms and intention to purchase is not significant with $\beta = 0.011$ and $p = 0.055$. Hence, it is evident that subjective norms are a factor that is slightly insignificant to predict the intention to purchase of consumers. According to Ruangkanjanes et al. (2020), the factor of subjective norm does not directly affect the perceptions of consumers over purchasing green products. Linear relationships only exist when the individuals or consumers are highly considering the attitude and behaviour of society. This result, however, is consistent with the previous studies of Chen et al. (2018) and Nguyen et al. (2017) that show the relationship of subjective norms and intention to purchase is not significant. Besides, Fischer et al. (2019) also suggested subjective norms could be different accordingly with cultural factors. The lack of influence of subjective norms triggers further concern. The results indicate the possibility that environmental concern is still very low among the consumers. It has not become a norm, where the consumers, as a group, support environmentally friendly products.

The findings of this study contribute to enhancing the understanding of effective strategies for bio-waste products, aiding marketers, and practitioners in developing targeted and impactful integrated bio-waste products campaigns that foster positive intention to purchases among customers. Two factors were found as significant determinants of consumers' intention to switch to products of bio-waste, namely product involvement and subjective norms. According to Niosi (2018), product involvement could significantly impact consumers' post-purchase behaviour, and therefore, causing the consumer to switch their intention afterwards. This evidence of finding is supported by Shukla (2004) and Adhikari (2019) reflecting a positive influence for product involvement with intention to switch. Such situations commonly occurred due to purchase experiences (Spacey, 2017).

Findings in relation to subjective norms are consistent with Ko and Jin (2013) and Wang (2014). Social pressure or subjective norms could influence consumers to switch their purchasing patterns for adapting to a new lifestyle or culture, if it meets their desires (Prati et al., 2015). The more desirable influences that exist in the society or surrounding, the higher the intention of consumers to switch from purchasing conventional products to environmentally friendly products (Ham et al., 2015).

Green self-identity on the other hand, was found to be not significant. It is highly possible that some of those who scored highly on green self-identity feel there is no need for them to switch products since they are already environmentally responsible purchases. Moreover, green self-identity could be relatively difficult to build and establish to cause the intention of consumers to switch their purchasing behaviour or attitudes (Sharma et al., 2020). According to Ong et al. (2015), green self-identity is the self-concept established by the individuals or consumers according to their environmental knowledge and attitude.

The increasing concern towards environmental issues has subsequently increased the urge to enhance awareness and understanding towards green purchasing behaviour. Consequently, these research findings can encourage society to perform green practices with the potential knowledge to mitigate and prevent environmental issues. For example, individuals can dispose their waste back to the manufacturer through applying the potential knowledge contributed by this study.

Furthermore, this study's findings also contribute to Malaysian government and regulatory parties through providing a clear message regarding consumers' perception towards bio-waste

products. Thereby, this study can encourage government or policy makers to formulate a better policy for society and business organisations. The initiatives could guide the practitioners to perform a proper transformation of waste with cost-efficient strategy and sustainable system.

Lastly, another practical implication of this study is to contribute the related literature to the marketers. The findings of this research create an opportunity for the marketers to apply close-loop supply chain strategy in their chain operations with the purpose of ensuring cost-efficient and sustainability, as well as contributing to environmental protection.

This study is not exempt from limitations, but it could potentially act as a guide for future research. Firstly, geographical constraints are presented in this research. The findings for this study were obtained from the consumers or individuals who are based in Penang. Nonetheless, consumers' attitudes and perceived value towards green products may vary accordingly in different states or regions due to culture difference and lifestyle difference. Therefore, the finding of this research is inappropriate to be generalised as representing the consumers in Malaysia. Secondly, the findings of this study were obtained and collected on a one-time basis. Reflecting the possibility of inaccuracy of data collection, as consumers' purchasing behaviour and perceptions could vary accordingly over time due to changes in trend and other possible factors. Thus, this study's findings are considered inappropriate to prove and evaluate the consumers' purchasing behaviour and perception over time. Thirdly, this study pertains to factors that are unknown to examine the consumers' perceptions towards bio-waste products. Although subjective norms have a higher possibility of impacting intention to purchase and switch, the reasons behind are unknown.

Future studies could avoid geographical constraints by utilising data across the states in Malaysia. This would allow scholars to capture the overall views of purchasing behaviour and perceptions with the considerations of different culture and lifestyle in Malaysia. Also, the period of conducting research findings should be lengthened, to capture different views and circumstances that could occur due to changes in trend. Besides, future studies could gain benefit using longitudinal data. Lastly, a clearer definition should be provided to ensure consumers are achieving the knowledge of bio-waste products. Thus, consumers could provide their answers pertaining to the questionnaire with full understanding. Finally, future studies are encouraged to explore the remaining unknown factors to obtain a better finding. For example, broader sources of subjective norms should be indicated in the questionnaires; and respondents' ethical status, as such factors could subsequently affect the results.

This study was conducted to examine the impact of consumers' perceptions towards bio-waste products. The findings of this study can be used by the Malaysian government to apply policies for the purpose of overcoming the existing environmental issues. Organisations should consider implementing closed-loop supply chains as part of their business strategy as this study has indicated that consumers tend to support products of bio-waste. Most importantly, this study aims to increase awareness for the importance of environmental protection among consumers.

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Issues and Perspectives in Business and Social Sciences

Who moved *my candy (sugar)*? Happiness or money

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Abstract

This study examines the interlinkages among happiness, income and sugar consumption using a short-balanced panel data of 129 countries for the period 2016-2020. Previous studies are mostly country-wise and do not consider their relationships simultaneously. This study generally finds that the direction of causality is from income to happiness, and to sugar consumption. Similar finding is observed for the developing economies. Meanwhile, income does cause happiness for the developed economies. For the economies in transition, it is from happiness to income and to sugar consumption. Both the impulse response and variance decomposition analyses complements these findings. This study is relevant for policy implications especially, to increase the society's income.

Keywords:

causality;
happiness;
income;
panel data;
sugar consumption.

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1. Introduction

"How to be happy?" is an ordinary question which people always ask in their daily life. Philosophers such as Aristotle, Plato and Socrates tried to define happiness and provided different ways of explanations. Researchers from various fields i.e., economics, philosophy, and psychology including social science scholars and politicians attempted to define happiness more precisely, and to identify its measures, access to happiness as well as the determination of happiness. Indeed, happiness economics has emerged to identify and examine the main determinants of happiness, and their association whether positive or negative. For instance, Ng (2022) pointed out that the "4 Fs" of happiness are Faith, Fitness, Family and Friends, and emphasized that a friend's companion could work to boost our moods where it could change from negative to positive. The World Happiness Report 2020 (Helliwell et al., 2020) has mentioned that hiking or walking alone improves mood by 2%, whereas walking with a buddy or partner improves mood by 7.5% or 8.9%. Physical activities which will ordinarily make you unhappy can be enjoyable when conducted with a companion or partner. For example, travelling or commuting on average can lower mood levels (1.9%), but mood increases by 5.3% for a journey done with a friend and 3.9% with a spouse. Even queuing or waiting, which is a considerable negative when done alone (-3.5%), becomes a net positive when conducted with a companion (+3.5%).

From the perspective of happiness economics, there are three fundamental ideas, namely happiness, life satisfaction and subjective well-being. Happiness can be broadly considered as a synonym for joy or as a result of several essential and meaningful activities in an individual's life (Fave et al., 2011). Happiness can be considered by both subjective and objective views (Frey &

Stutzer, 2002). Life satisfaction captures an individual's various circumstances, whereas emotions and feelings are inconsistent. However, emotions enable us to comprehend both the positive and negative parts of our lives (Helliwell & Barrington-Leigh, 2010). Subjective well-being, on the other hand, is a self-reported judgement of life that falls into three basic categories: negative emotions, positive emotions and life evaluations (Helliwell & Barrington-Leigh, 2010). They assert that it consists of two elements: a person's personality and his or her attitude toward occurrences in life.

More precisely, happiness is measured in the form of utility in happiness economics (Bentham, 1789). Currently, studies utilize happiness economics as a way to measure people's wellbeing using surveys by focusing on the happiness reported. According to Diener et al. (1985), the concept of "life satisfaction," which is a self-reported measure of overall happiness is one of the common methods of measuring happiness. It is typically measured on a scale from 1 to 10, with 10 indicating the highest level of satisfaction. Dolan et al. (2008) found that self-reported measures of happiness and life satisfaction are reliable and valid indicators of overall well-being. By the same token, Diener et al. (2010a) considered that hedonic measures are useful for predicting long-term changes in well-being. On top of that, happiness economics has broadened the concept of happiness which incorporates factors beyond income and considers their impacts. This has complemented the income-based measures of welfare. They (Diener et al., 2010b) found that factors like positive social relationships, meaningful work, and healthy lifestyles were all related to subjective well-being. Helliwell et al. (2019) documented that social support, generosity, trust, and freedom were all positively associated with life satisfaction across 156 countries.

Happiness, income and sugar are elements which play an important role in our daily life. However, the linkages between these three variables are not clearly ascertained in the field of either happiness economics or social science related studies. Easterlin (1974) analysed the association between happiness and income that income has a direct relation to individual happiness. Easterlin (2001) demonstrates that at a certain period in time, lower income persons are on average less pleased than higher income ones. As reported by The Economist (2019), economic growth does not necessarily guarantee happiness that the correlation between long-term GDP per person and happiness is weak among 125 countries. While 43 countries that move in opposite direction.

Undoubtedly, sugar (sugary goods) is said to make an individual happy (Lenoir et al., 2007; Kendig, 2014) which has been overlooked by happiness economists. Sugar has been found to have an impact on brain function and behaviour, including the release of hormones and neurotransmitters that are associated with happiness and pleasure. Lenoir et al. (2007) revealed that sugar consumption can stimulate the release of dopamine in the brain, which is associated with pleasure and reward. Sugar can increase the release of endogenous opioids, which are associated with pain relief and pleasure. According to Dehlinger (2020), a transitory result of consuming sugar is that serotonin levels will increase, causing the individual to feel happy. Kendig (2014) highlights that sugar can alter reward-related behaviour. However, ingestion of excessive amounts of sugar relies on triggering mechanisms that promote addictive-like behaviours, and on overriding neuroendocrine signals that protect internal milieu (Olszewski et al., 2019).

Biologically, sugar is said to be one of the determinants of happiness. Theoretically, the more sugar we eat, the more dopamine and serotonin will be released by Amygdala leading us to feel happier (Barclay, 2014). Sugar would make people happier, but research has found that higher sugar intake from food and beverages induces a higher chance of mental disorder which in fact causes depression and lower happiness (Knüppel et al., 2017). According to Mintz (1986), in ancient times, sugar was a luxury item that was expensive and only available to the wealthy. It became a symbol of social status and was used to show off one's wealth and status. For example, in medieval Europe, sugar was often used in elaborate banquet dishes to impress guests and demonstrate the host's wealth and power (Willan, 2016). Sugar was also used as a status symbol

in other parts of the world, such as in ancient India and China, where it was reserved for the elite and used in religious ceremonies. In the global trade market, it represents power to enslave the population (Galván, 2004). As industrialization takes place, sugar can be consumed in large quantities by the population now. Sugar loses its symbolic value and status as glamorous luxury as dietary importance becomes widespread. Sugar still serves as an important element in ritual or ceremony (Mintz, 1986).

Hence, this study focuses on the direction of causality among happiness, income, and sugar, and complemented by the impulse response and variance decomposition analyses. It covers short-balanced panel data of 129 countries from 2016 to 2020. It also investigates the findings among the three stages of development, namely, development economies, developing economies and economies in transition.

This study is organized as follows: The next section reviews the past studies on happiness associated with income, and sugar. Section 3 is methodology which describes the conceptual framework, variables (data) and the respective testing methods i.e., Granger non-causality tests, impulse response functions, and variance decomposition. The empirical results and discussions are in Section 4. Section 5 concludes this study.

2. Literature review

Over the past few decades, studies have been carried out in the human happiness-related field. Happiness relates to how individuals perceive and assess their lives, as well as particular areas and activities within them (Panel on Measuring Subjective Well-Being in a Policy-Relevant Framework; Committee on National Statistics; Division on Behavioral and Social Sciences and Education; National Research Council, 2013). , while economists are investigating the economic related determinants of happiness. In a nutshell, human happiness could be affected by various factors beyond macroeconomics, like income per capita and food intake, such as sugar and sports.¹ This section considers only two variables viz. income and sugar consumption interlinkage with happiness.

2.1 Happiness and income

The association (relationship) between happiness and income is a controversial issue of happiness study. A group of economists argues that happiness is positively associated with income. According to the Easterlin Paradox, happiness initially fluctuates directly with income both between and within countries; however, happiness and income are not significantly correlated in the long run. Social comparison is the main cause of the paradox, even though people with higher incomes tend to be happier. Easterlin (2001) illustrated that rising everyone's income will not make everyone happier since their relative income has not increased. Graham and Pettinato (2001) demonstrated that at any given time, a society's level of happiness and individual income are positively correlated. Also, they found that self-reported life satisfaction increases with individual income. However, it also decreases with county-level income. The finding is consistent with the idea that relative income affects happiness. In countries with a

¹ Other studies looked at happiness and sport (Kavetsos & Szymanski, 2010; Huang & Humphreys, 2012). Kavetsos and Szymanski (2010) found that hosting sporting events such as the FIFA World Cup and Olympic Games affects happiness in general. Hosting the FIFA and UEFA championships has increased happiness among the residents of host countries in the short term. Major sport events bring feel-good effect in the duration of events among the citizens of the hosting country. In addition, Huang and Humphreys (2012) explained that there are higher chances for individuals to be involved in sport and physical activity if there are a greater number of sport facilities. By participating in sports, these individuals recorded higher life satisfaction. Overall, sport has positively affected an individual's happiness.

higher median income, an individual is more likely to observe or interact with someone who earns more than they do, reducing the individual's happiness (Huang & Humphreys, 2012). Another group of studies focuses on the happiness influence on income (Achor, 2010; Como, 2011). For example, Como (2011) found that being positive, happy and high self-esteem causes a higher income level. Extra happy and high-self-esteem individuals significantly earn higher income as compared to those individuals who are less happy in the labour market. The study concluded that happier people would become wealthier.

Several studies claimed that there is no clear-cut relationship between happiness and income. Castellanos (2020) used a combination of quantitative and qualitative methods to synthesize and analyse the data from the selected studies among 127 countries and found that income has a lower incidence of happiness. Indeed, income is not statistically significant even though happiness increases with income. There is a positive correlation between income and happiness, but such correlation is unclear and depends on a variety of factors. Castellanos (2020) pointed out that people living in poverty in Guatemala declare a high level of happiness. Similarly, using data from the European Social Survey and the World Happiness Reports, Gabrielova (2022) examined the relationship between income and happiness across different countries and cultures. The ordinary least squares (OLS) regression estimates showed the strongest relationship between income and happiness in high-income countries and among individuals who are already relatively well-off. In the low- and middle-income countries, the relationship between income and happiness is weaker and may even be negative in some cases. In general, Gabrielova (2022) found that the relationship between income and happiness is complex and multifaceted and varies across different countries and cultures.

2.2 Happiness and sugar consumption

There have been several studies investigating the association between happiness and sugar consumption. While there is no definitive conclusion, there is some evidence that support excessive sugar consumption may increase overall happiness. Consuming raw sugar (or sweet foods) can increase the levels of dopamine and serotonin in the human brain. These neurotransmitters play a crucial role in regulating various bodily functions (Fiorino & Phillips, 1999). Movement, coordination, and a person's experiences of reward and pleasure are all influenced by dopamine, while emotion, digestion and metabolism are affected by serotonin. The more sugar we consume, the more dopamine and serotonin will be released by the amygdala leading us to feel happier (Barclay, 2014). Yet, excessive sugar would lead to brain addiction and inflammation. Inflammation will negatively impact human emotions such as depression and anxiety. It could be said that excessive intake of sugar results in poor mental health (Timberlake & Dwivedi, 2018). Happiness can affect sugar consumption (O'Connor et al., 2008). O'Connor et al. (2008) used structural equation modelling to ascertain the relationships between daily hassles, eating style, and eating behaviour. People who reported higher levels of stress and negative emotions were more likely to consume sugary foods and beverages than those who reported lower levels of stress and negative emotions. Therefore, individuals may turn to sugary foods as a way of coping with negative emotions and potentially increasing their happiness levels. Overall, the study concluded that less happiness would lead to higher levels of sugar consumption.

2.3 Income and sugar consumption

The association between sugar consumption and income is complex that may vary depending on different factors such as time period, location, and cultural context. According to Mintz (1986), sugar served as a symbol of wealth, status, and power in many cultures due to its scarcity in the past. Drewnowski & Rehm (2014) found that higher income was associated with greater consumption of added sugars among US adults. The data are from the National Health and Nutrition Examination Survey (NHANES) from 2005 to 2010. The multivariable regression

analysis also found that individuals in the highest income group consumed an average of 46.2 36.1 grams per day. Some studies found a negative relationship between income and sugar consumption (Elsevier Health Sciences, 2009; Masood et al., 2012; French et al., 2019). French et al. (2019) found that lower-income households would purchase extra sugary foods as compared to the higher-income groups after adjusting for education, marital status and race. The study compared 202 urban households with 14 days of food shopping. The NDS-R programme was used to evaluate the purchase data, which was then evaluated using the Healthy Eating Index 2010. The study indicates that as income increases, demand for sugar will decrease. This is consistent with the earlier findings found by Elsevier Health Sciences (2009) and Masood et al. (2012). In short, lower income levels are associated with higher sugar consumption.

This topic is further investigated by Liu et al. (2022). They found an “inverted U-shaped” relationship between income level and household consumption of sugar-sweetened beverage. They used the data available from a national survey of beverage consumption patterns in China, that conducted between October 2019 and January 2020. The estimated logistics regression showed that increases in income will induce higher sugar consumption. Nevertheless, given an income threshold, individual consumption of sugar starts to decrease. Higher income individuals tend to have lower consumption of sugar due to education factor and health awareness. Intake of excessive sugar will lead to health problems such as obesity, high blood pressure and fatty liver disease (Harvard Health, 2017).

3. Research method

3.1 Conceptual framework

Figure 1 conceptualizes the directions of causality (or interlinkages) among happiness, income and sugar consumption as inspired by the previous studies. In layman's terms, it is about "*Chicken or egg: which came first?*" Indeed, the cause must come before the effect! (Granger, 1988, p. 200) That is to look at, either income causes sugar consumption, or vice versa, in Granger's sense. Also, if income causes happiness, and vice versa. It is possible that sugar consumption causes happiness and vice versa. A bi-directional between the variables may be hold, i.e. interdependent between happiness and income, for example.

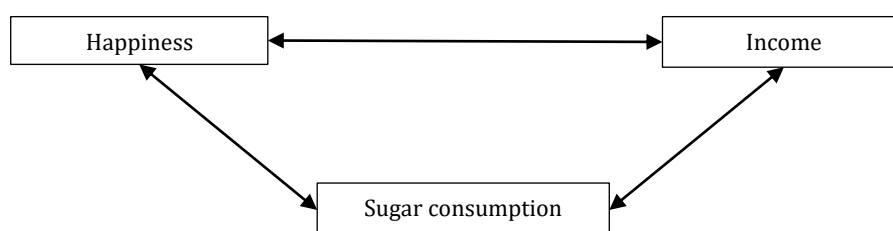


Figure 1. Conceptual framework of interlinkages among happiness, income and sugar consumption.

The key concepts of such interlinkages among happiness, income and sugar consumption are rooted by both theories and empirical findings. Economists consider happiness as subjective well-being, in which an individual's evaluation of their life satisfaction, positive emotions, and sense of purpose or meaning (Kahneman et al., 1999). Income, as viewed by Hewett (1925) is the money measure of the net general welfare that accrues to an individual, group, or nation from economic activity during a certain period of time. It represents the amount of money earned after deducting all expenses incurred in generating that income and includes all forms of compensation such as salaries, wages, profits, dividends, interests, and rents (Hewett, 1925). Income reflects the economic welfare of an individual or group (households), as it enables access to goods and

services that contribute to their well-being. Meanwhile, World Health Organization (WHO) considers sugar consumption as the amount of sugar that an individual or population consumes as a part of their diet over a certain period of time.

The Easterlin Paradox explains that at a point in time happiness varies directly with income, both among and within nations, but over time the long-term growth rates of happiness and income are not significantly related (Smith, 2014). Como (2011) found that happier individuals have a higher income as compared to individuals who are less happy in the labour market. The relationship between happiness and sugar consumption mostly to be understood in the context of biological and psychological perspectives (Fiorino & Phillips, 1999; O'Connor et al., 2008; Timberlake & Dwivedi, 2018). A low happiness level induces a higher amount of sugar intake (O'Connor et al., 2008) because individual intake of sugary foods helps individuals cope with their negative emotions and potentially increases their happiness level. Excessive intake of sugar results in poor mental health, which lowers happiness (Timberlake & Dwivedi, 2018). Income and sugar consumption is negatively associated (Elsevier Health Sciences, 2009; Masood et al., 2012; French et al., 2019). Elsevier Health Sciences (2009) considers that higher income levels are associated with lower sugar consumption. However, an “inverted U-shaped” relationship between income and sugar consumption (Liu et al., 2022) - a rise in income will induce higher sugar consumption; however, up to a certain amount of income, individual consumption of sugar starts to decrease.

3.2 Variables and data

Table 1 describes the variables employed by this study, namely happiness, income and sugar consumption. In brief, the happiness variable is the happiness score collected and published by WHR. While the income variable is represented by real GDP per capita based on the Purchasing Power Parity (PPP) constant in 2017. Lastly, sugar consumption per capita represents the sugar consumption - sweet foods (candies). This study collects and uses a short-balanced panel data of 129 countries for the period 2016-2020 (annual) because of data unavailability for longer period. That is, the happiness score is available between 2016 and 2023, while the sugar consumption data last up to 2020 (from 1961). The 129 countries include those with developed economies (35 countries), developing economies (79 countries), and economies in transition (15 countries) as in Appendix A.

Table 1. Variables definition and sources

Variables	Definition	Sources
Happiness (<i>H</i>)	The World Happiness Report (WHR) scores are based on Gallup World Poll surveys, which are performed in more than 160 countries and 140 languages. The worst-case scenario as a 0 and the best-case scenario as a 10.	World Happiness Report (WHR) 2020. Available at https://worldhappiness.report/ed/2020/
Income, (<i>I</i>)	Based on purchasing power parity (PPP), real GDP per capita. Gross domestic product adjusted to international currency using purchasing power parity rates is referred to as PPP GDP. An international dollar has the same purchase power in terms of GDP as the US dollar. Data are in constant 2017 international dollars.	The World Bank. Available at https://databank.worldbank.org/source/world-development-indicators#
Sugar Consumption (<i>S</i>)	Sugar intake per capita (kg) is an important statistic for comparing food consumption and dietary habits between nations and demographic groupings. It is collected by Food and Agriculture Organization of the United Nations statistics division (FAOSTAT) and made accessible as a yearly time series by the Helgi Library.	Helgi Library. Available at https://www.helgilibrary.com/indicators/sugar-consumption-per-capita/

Table 2 tabulates the summary statistics of the variables in general (i.e. all 129 countries), and three groups based on their stages of development, namely developed economies, developing economies, and economies in transition. The average happiness score (as indicated by the

median) is 5 score which is ambiguous in between 0 and 10. For the developed economies, that is 7. The happiness for both developing economies and economies in transition are indifferent with an average score rounding to 5. The average world income is about \$14 thousand per year. Developed economies have the highest at \$42 thousand, followed by economies in transition (\$13 thousand), and \$9 thousand on average for developing economies. For the sugar consumption, the average is 26.04 kg globally. The developed economies have the highest average sugar consumption of approximately 32 kg, while developing and developed economies had a similar sugar consumption level, about 22kg.

As observed from Table 2, developed economies have the highest average happiness, income and sugar consumption, while developing economies recorded the lowest for these. Consistently, these variables are higher for economies in transition than in developing economies. It intuitively reveals a positive correlation between happiness and income, also the same insight between income and sugar consumption. The standard deviation informs the dispersion (variation) of happiness is 1 for all countries and developing economies. While the smallest dispersion of happiness is for economies in transition (0.6), followed by developed economies (0.8). The dispersion of world income is \$21 thousand per year. The developed economies recorded the highest dispersion of income that is \$17 thousand, followed by developing economies (\$15 thousand) and economies in transition (\$6 thousand). For sugar consumption, the world dispersion is 12 kg, while developing economies have the highest dispersion (13 kg) while developed economies (9 kg), and economies in transition (7 kg).

Table 2. Summary statistics

	Mean	Median	Maximum	Minimum	Standard deviation
All 129 countries					
Happiness (Score 1 – 10)	5.476	5.489	7.809	2.567	1.115
Income (\$)	22,142	14,253	116,284	711	21,176
Sugar consumption (kg per capita)	25.318	26.04	50.86	2.94	11.767
Developed economies					
Happiness	6.556	6.725	7.809	4.217	0.792
Income	46,357	42,862	116,284	20,741	17,450
Sugar consumption	31.434	31.920	50.860	10.750	8.689
Developing economies					
Happiness	5.041	4.975	7.167	2.567	0.99
Income	12,893	9,048	98,337	711	15,268
Sugar consumption	22.845	21.7	50.77	2.94	12.645
Economies in transition					
Happiness	5.247	5.323	6.258	4.096	0.561
Income	14,350	13,653	27,255	3,091	6,380
Sugar consumption	24.076	21.750	42.300	13.180	7.318

3.3 Unit root tests

Table 3 shows the findings of five types of panel unit root test. They are the Levin, Lin and Chu *t*-statistics, the Breitung test, Im, et al. *W*-statistics, the ADF-Fisher Chi-square statistics, and the PP Chi-Square test. It is to ascertain the stationarity of each variable as well as by the three economic groups. They determine whether the trending data (i.e., non-stationary variables. $I(1)$ or $I(2)$) should be first differenced (or regressed on deterministic functions of time) to ensure stationary, $I(0)$. As the findings revealed in Table 3, most of the variables did not reject the null hypothesis at a 10% level of significance, indicating non-stationarity. Therefore, all the variables are differenced once, i.e., $\Delta X_t = X_t - X_{t-1}$ for convenience. This process is crucial for the time series data (including panel data) given that stationary data is often a necessary and sufficient condition for many statistical models, such as OLS regression analysis.

Table 3. The results of panel unit root tests.

	Levin, Lin & Chun t stat	Breitung t-stat	Im, Pesaran and Shin W-stat	ADF-Fisher Chi-square stat	PP Chi-square stat
All 129 countries					
Happiness (<i>H</i>)	√	×	√	√	√
Income (<i>I</i>)	×	×	×	×	×
Sugar consumption (<i>S</i>)	√	×	√	×	√
Developed economies					
Happiness (<i>H</i>)	√	×	√	×	√
Income (<i>I</i>)	×	×	×	×	×
Sugar consumption (<i>S</i>)	√	×	√	√	√
Developing economies					
Happiness (<i>H</i>)	√	×	√	√	√
Income (<i>I</i>)	×	×	×	×	×
Sugar consumption (<i>S</i>)	√	×	√	×	√
Economies in transition					
Happiness (<i>H</i>)	√	×	×	×	√
Income (<i>I</i>)	×	×	×	×	×
Sugar consumption (<i>S</i>)	√	×	×	×	×

Notes: “√” indicates a rejection of the null hypothesis that the underlying variable (data) has a unit root (individual unit root process) at least at 10% significance level ($p < 0.10$). “×” indicates not reject the null hypothesis. Automatic lag length selection based on AIC is 0. The underlying assumptions of the tests for the exogenous variables are individual effects, individual linear trends; and Newey-West automatic bandwidth selection and Bartlett kernel apply. The tests assume a common unit root process and individual unit root process. The equations consider individual effects and individual linear trends for the data at levels. All data are transformed into natural logarithm (\ln).

3.4 Panel Granger Non-Causality Tests

In brief, the VAR (vector autoregressive) model is a statistical approach to describe the evolution of multivariate linear time series with k endogenous variables. It ensures all k variables are stationary. The VAR based Granger non-causality tests (Granger, 1969) were applied in order to examine the possible direction(s) of causality among happiness, income and sugar consumption. This study considers this approach (Dumitrescu & Hurlin, 2012) with a trivariate framework (in a panel data) capturing the conceptual interlinkages among happiness, income, and sugar consumption as illustrated in Figure 1. In general, Granger non-causality tests are to test the ‘predictiveness’ of one variable in the past to another in the current. For example, it estimates whether the lagged values of income help predict the current happiness. and vice versa. Income is said to Granger cause happiness if income is “helpful” for predicting the happiness score. The term “helpful” in this context means that when lagged value is added to the model, income can improve the explanatory power of happiness. More technically, in the context of VAR (OLS) estimation, income does not Granger cause happiness variable if the estimated coefficients of the lagged variable are jointly statistically insignificant. The following VAR equations are specified for panel Granger non-causality tests:

$$\Delta H_{i,t} = \alpha_{i,t} + \sum_{j=1}^{p=3} \beta_{1,i,j}(\Delta H_{i,t-j}) + \sum_{j=1}^{p=3} \lambda_{1,i,j}(\Delta I_{i,t-j}) + \sum_{j=1}^{p=3} \psi_{1,i,j}(\Delta S_{i,t-j}) + \mu_{i,t} \quad (1)$$

$$\Delta I_{i,t} = \theta_{i,t} + \sum_{j=1}^{p=3} \lambda_{2,i,j}(\Delta I_{i,t-j}) + \sum_{j=1}^{p=3} \beta_{2,i,j}(\Delta H_{i,t-j}) + \sum_{j=1}^{p=3} \psi_{2,i,j}(\Delta S_{i,t-j}) + \varepsilon_{i,t} \quad (2)$$

$$\Delta S_{i,t} = \phi_{i,t} + \sum_{j=1}^{p=3} \psi_{3,i,j}(\Delta S_{i,t-j}) + \sum_{j=1}^{p=3} \beta_{3,i,j}(\Delta H_{i,t-j}) + \sum_{j=1}^{p=3} \lambda_{3,i,j}(\Delta I_{i,t-j}) + \tau_{i,t} \quad (3)$$

where H is happiness, I is income and S is sugar consumption. i refers country and t refers time period. α , θ and ϕ are coefficients that capture the lagged effects for their respective variables in the equations. Δ is first difference operator, p is the lag length to be included, μ_t , ε_t and τ_t are error terms for three equations respectively which is assumed to have zero mean, constant variances and uncorrelated.

In VAR equations, the computed *Chi*-square test statistics are used to reject the null hypothesis, or if the computed p -value is less than the conventional level of significance, i.e. 1%, 5% and 10%. Such as equation (1), the hypotheses are as follows: The first null hypothesis, $H1_0: \sum \lambda 1_{i,j} = 0$ that is “income does not Granger cause happiness”. If the computed *Chi*-square test statistics is greater than its critical value at 10% level, or its p -value is less than 0.10, this [null] hypothesis can be rejected, and the direction of causality is from income to the happiness. The second null hypothesis, $H2_0: \sum \psi 1_{i,j} = 0$ for “the sugar consumption does not Granger cause the happiness”. A joint causality, that is the third null hypothesis, $H3_0: \sum \lambda 1_{i,j} = 0; \sum \psi 1_{i,j} = 0$ that “both income and sugar consumption does not jointly Granger cause the happiness”. For equations (2) and (3), similar procedure and interpretation apply.

The lag length, p to be included in the VAR equation(s) is based on the smallest value of the criterion - final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn criterion (HQ). Their statistics are reported in Table 4. For all countries and developing economies both 1 lag and 3 lags are considered for their VAR equation(s). For the developed economies, 1 lag is preferred (LR, FPE, AIC, and HQ). The SIC suggests 0 (zero) lag which is ignored since no exogenous variables in the VAR, the lag starts at 1. For economies in transition, 1 lag is used since the five criterions select 0 lag, and 2 lags which is infeasible given the nature of short panel data with only 15 countries.

Table 4. VAR lag order selection criteria

Lag	LR	FPE	AIC	SC	HQ
All 129 countries					
0	NA	0.000	-8.307	-8.240	-8.280
1	69.222	0.000	-8.721	-8.455#	-8.613#
2	16.928	0.000	-8.720	-8.254	-8.531
3	17.211#	0.000#	-8.725#	-8.060	-8.455
Developed economies					
0	NA	0.000	-11.597	-11.464#	-11.551
1	27.595#	0.000#	-11.973#	-11.439	-11.789#
2	10.337	0.000	-11.828	-10.894	-11.505
3	8.0667	0.000	-11.636	-10.303	-11.176
Developing economies					
0	NA	0.000	-7.451	-7.361	-7.415
1	50.805#	0.000#	-7.900	-7.541#	-7.756#
2	15.288	0.000	-7.885	-7.255	-7.633
3	16.889	0.000	-7.902#	-7.002	-7.541
Economies in transition					
0	NA#	0.000#	-10.588#	-10.447#	-10.590#
1	6.364	0.000	-9.967	-9.400	-9.973
2	2.772	0.000	-9.113	-8.122	-9.124
3	10.464	0.000	-10.006	-8.590	-10.021

Notes: # indicates lag order selected by the criterion. Each test at 5% level. LR = sequential modified LR test statistic; FPE = Final prediction error; AIC = Akaike information criterion; SC = Schwarz information criterion; and HQ = Hannan-Quinn information criterion. For FPE, the selection # is based on more decimal places instead of three as presented.

The VAR based Granger non-causality tests inform the direction(s) of causality among the endogenous variables, but they do not tell how one variable responses to another. Therefore, impulse response functions are utilized to complement the findings of causation. Impulse response functions which based on VAR, through graphical representation, describe how a variable reacts over time to a shock(s) (of one or more standard deviations) which are considered exogenous impulses. More specifically, an impulse response function shows the dynamic effect of a one-time shock to an independent variable on the future values of a dependent variable while

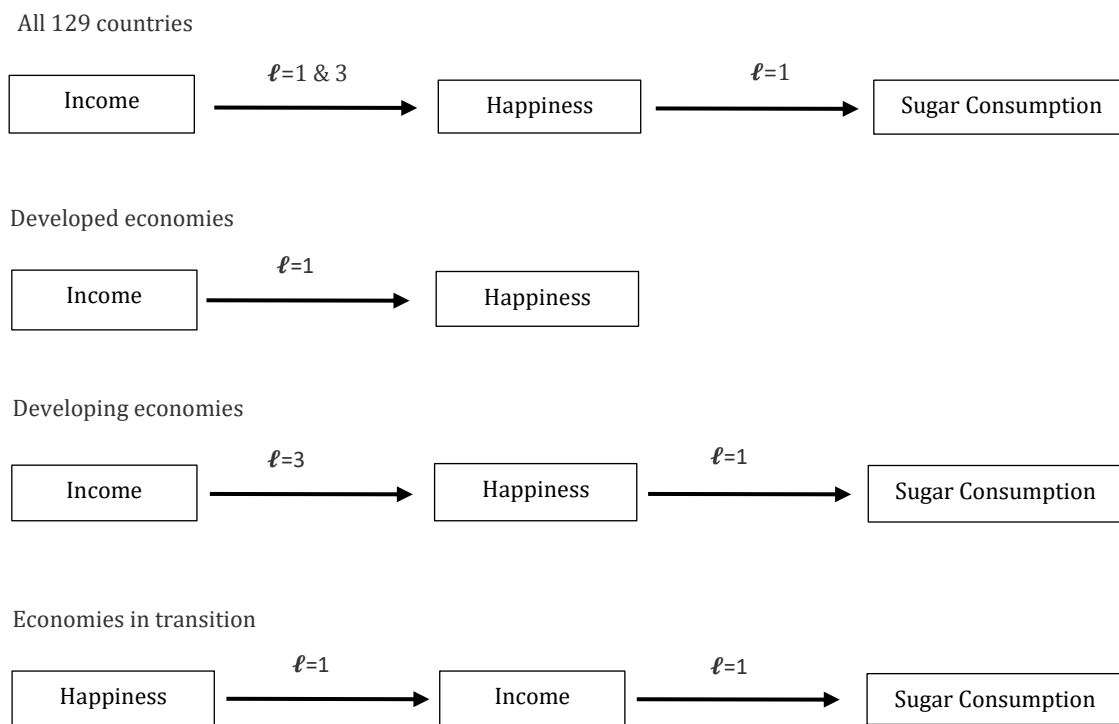
holding all other variables constant. It comes with variance decomposition analysis which further describes how the variance of each variable is explained by its own innovations, and the innovations of the other variables in the VAR system. Variance decomposition aims to measure the relative contributions of these different sources of variation to the overall variance of each variable. Technically, it is to decompose the variance of a variable into the proportion of the variance that is due to its own shocks (the "own variance") and the proportion that is due to the shocks of the other variables in the system (the "cross variance").

4. Empirical results

Figure 2 summarizes and illustrates the findings of panel Granger non-causality tests of a trivariate VAR framework involving the variables - happiness, income, and sugar consumption. It covers all 129 countries, and the three different stages of development viz. developed economies, developing economies, and economies in transition. The computed test statistics of Granger non-causality are tabulated in Appendix B for further reference. In general, for all the 129 countries panel, there is a unidirectional causality running from income to happiness with 1 lag and 3 lags at 5% level of significance. In addition, happiness does Granger cause sugar consumption (1 lag) at the 5% level of significance. This implies that happiness has a mediating effect on income to sugar consumption. Indeed, both income and sugar consumption do jointly Granger cause happiness at the 10% level of significance. Also, both happiness and income jointly cause sugar consumption at the 10% level of significance. Looking at the panel of developing economies, the same findings are occurred as the word (i.e. all 129 countries). However, only both income and sugar consumption jointly Granger cause happiness (3 lags) at the 5% level of significance.

For the developed economies, causality is only found from income to happiness in 1 lag at the 10% level of significance. In fact, sugar consumption has no implication in this context. However, both sugar consumption and income are found to have jointly caused happiness. Conversely, for economies in transition, happiness comes first, and does Granger cause income in 1 lag at the 5% level, while income causes sugar consumption (1 lag) at the 10% level of significance. More specifically, both happiness and sugar consumption jointly Granger cause the income. And, both happiness and income do jointly Granger cause the sugar consumption (in 1 lag at the 5% level of significance). Overall, the last variable to be caused (or appear) is sugar consumption for all panels (groups), except for developed economies. Happiness - remains its conventional fashion that income can buy happiness, but it is not the case for the economies in transition, in which happiness is being considered as 'built-in' (born) or nature to them.

To understand further the interlinkages (interactions) among the variables, Figures 3-6 show the impulse response results among happiness, income and sugar consumption for all 129 countries, developed economies, developing economies and economies in transition. For all countries' results (Figure 3), both the 1 and 3 lags give different results. In this case, 3 lags results are preferred given their reasonable responses over the period. Happiness increases immediately until year 2 in response to a shock in income before decreasing towards equilibrium in year 10. Happiness responds negatively to other shocks, i.e., own happiness, and sugar consumption. For developed economies ((Figure 4), happiness is found to have negative responses to the two shocks, namely its own happiness and sugar consumption at 1 lag. Happiness shows a positive response to the shock in income over the 10 years. For the developing countries (Figure 6), similar observations are delivered as the case of all countries. For economies in transition (Figure 5), happiness responds negatively to all shocks, i.e., own happiness, income and sugar consumption at 1 lag.



Notes: ℓ indicates lag. The figures illustrate the direction of causation among the underlying variables, at least at 10% level of significant.

Figure 2. Granger non-causality tests among happiness, income and sugar consumption

Table 5 reports the variance decomposition statistics of the three variables for all countries as well as for each stage of development. The results reveal that happiness is largely explained by its own (59-88% for period 10), then by income (12-38%) for all countries, in general. Very little is explained by sugar consumption (3%). In developed economies, happiness is mainly explained by income (84%) followed by its own happiness (16%) at period 10. In developing economies, happiness is explained by its own (48-92%) and by income (7-47%) at period 10. While happiness is slightly explained by sugar consumption (0-5%). For economies in transition, happiness is mostly explained by its own (93%) and little by income (7%) at period 10.

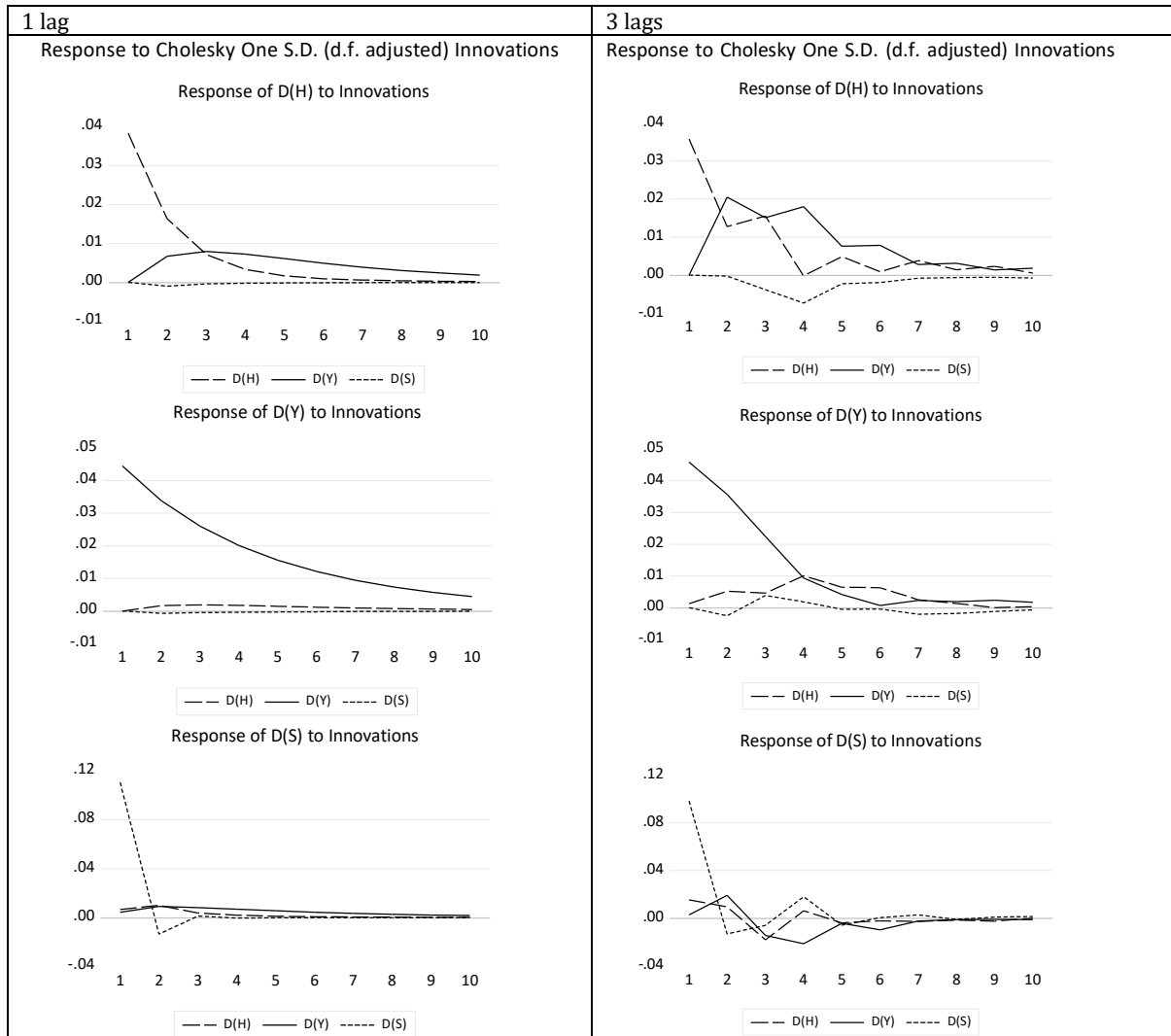


Figure 3. Impulse response for all 129 countries

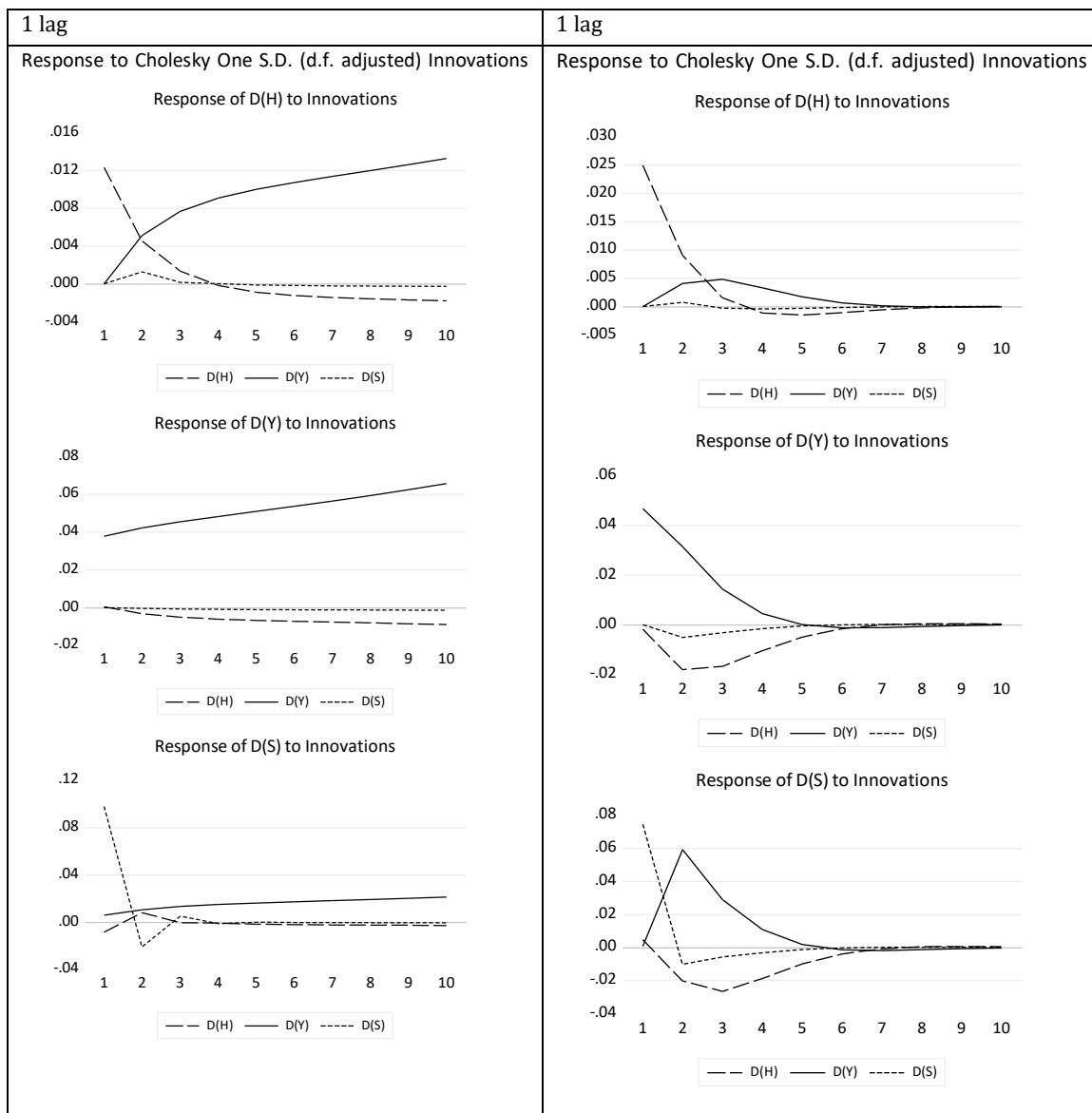


Figure 4. Impulse response for developed economies

Figure 5. Impulse response for economies in transition

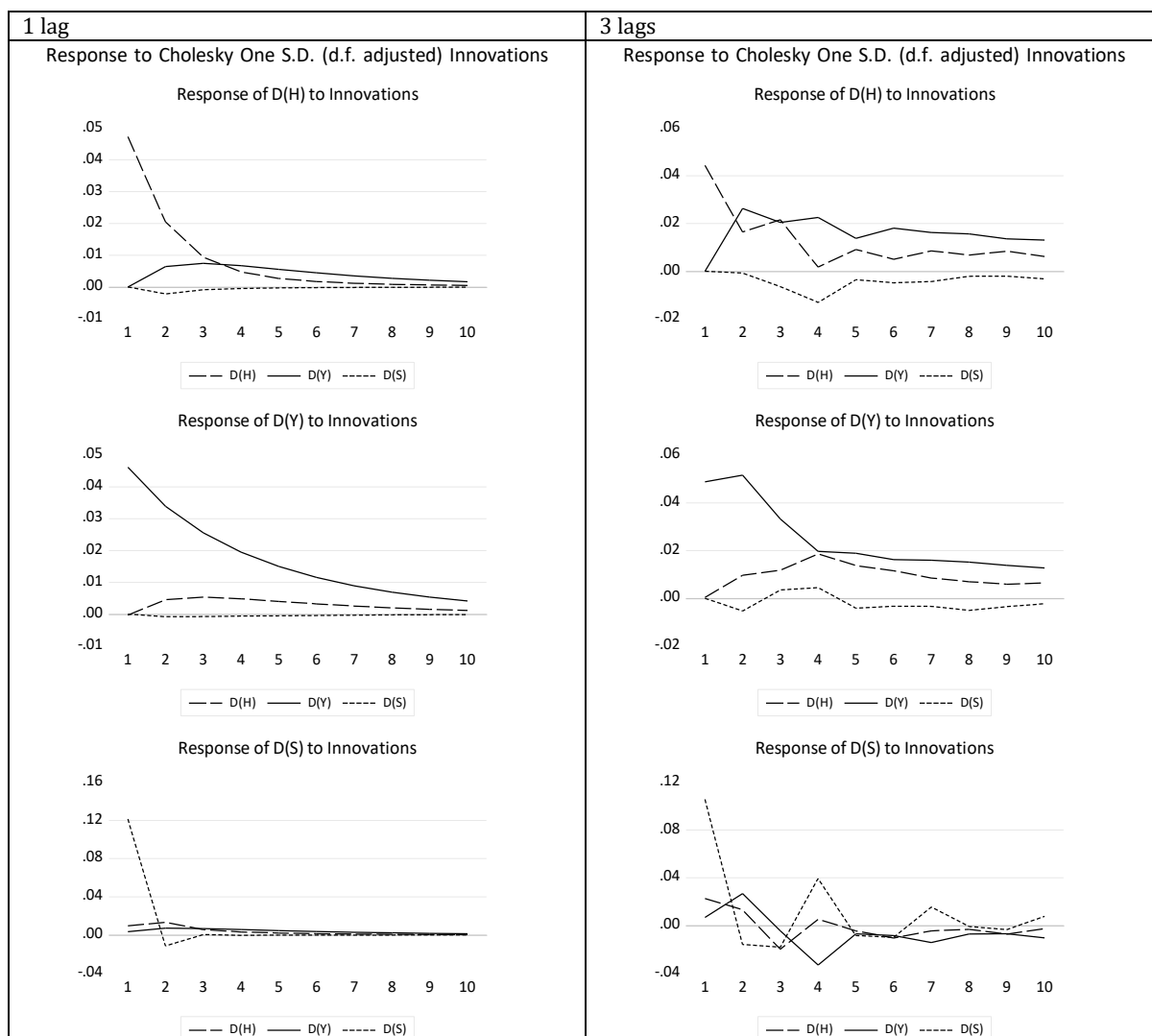


Figure 6: Impulse response for developing economies

Table 5: Results of variance decomposition among happiness, income and sugar consumption

All 129 countries								
Variance Decomposition of ΔH (1 lag):					Variance Decomposition of ΔH (3 lags):			
Period	S.E.	ΔH	ΔY	ΔS	S.E.	ΔH	ΔY	ΔS
1	0.038	100.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.036	100.000 (0.000)	0.000 (0.000)	0.000 (0.000)
2	0.042	97.409 (2.498)	2.533 (2.397)	0.059 (0.405)	0.043	77.429 (11.236)	22.567 (11.307)	0.004 (0.547)
3	0.044	94.238 (5.088)	5.697 (5.019)	0.065 (0.396)	0.048	71.760 (12.280)	27.621 (12.237)	0.619 (1.382)
4	0.044	91.728 (7.006)	8.205 (6.953)	0.067 (0.382)	0.052	61.808 (14.182)	35.689 (15.077)	2.503 (3.023)
5	0.045	90.034 (8.312)	9.899 (8.268)	0.067 (0.372)	0.053	60.753 (15.077)	36.639 (16.180)	2.608 (3.192)
6	0.045	88.961 (9.201)	10.971 (9.164)	0.067 (0.366)	0.054	59.390 (16.087)	37.932 (17.271)	2.679 (3.281)
7	0.045	88.300 (9.820)	11.632 (9.788)	0.067 (0.363)	0.054	59.422 (16.292)	37.898 (17.511)	2.680 (3.264)
8	0.045	87.898 (10.263)	12.035 (10.233)	0.067 (0.361)	0.054	59.240 (16.789)	38.076 (17.996)	2.684 (3.232)
9	0.045	87.654 (10.830)	12.279 (10.560)	0.067 (0.360)	0.054	59.270 (16.975)	38.042 (18.174)	2.688 (3.195)
10	0.045	87.506 (10.830)	12.427 (10.804)	0.067 (0.359)	0.054	59.195 (17.348)	38.101 (18.553)	2.704 (3.187)

Variance Decomposition of ΔY :					Variance Decomposition of ΔY :			
1	0.044	0.000 (0.347)	99.999 (0.347)	0.000 (0.000)	0.046	0.075 (1.307)	99.925 (1.307)	0.000 (0.000)
2	0.056	0.081 (0.492)	99.899 (0.646)	0.019 (0.391)	0.058	0.833 (1.908)	98.972 (1.991)	0.195 (0.582)
3	0.062	0.157 (0.750)	99.819 (0.899)	0.024 (0.457)	0.063	1.248 (2.336)	98.207 (2.933)	0.545 (1.209)
4	0.065	0.211 (0.936)	99.763 (1.078)	0.026 (0.491)	0.064	3.629 (4.332)	95.774 (5.186)	0.598 (1.852)
5	0.067	0.245 (1.055)	99.728 (1.191)	0.027 (0.508)	0.065	4.564 (5.211)	94.840 (5.944)	0.596 (1.923)
6	0.068	0.266 (1.129)	99.706 (1.260)	0.028 (0.518)	0.065	5.449 (6.046)	93.956 (6.623)	0.595 (1.917)
7	0.069	0.278 (1.175)	99.693 (1.303)	0.028 (0.525)	0.065	5.573 (6.168)	93.733 (6.765)	0.695 (1.901)
8	0.069	0.286 (1.204)	99.686 (1.331)	0.029 (0.529)	0.065	5.603 (6.315)	93.623 (6.947)	0.774 (1.902)
9	0.069	0.290 (1.224)	99.681 (1.349)	0.029 (0.532)	0.065	5.594 (6.373)	93.600 (7.026)	0.807 (1.895)
10	0.069	0.293 (1.237)	99.678 (1.361)	0.029 (0.534)	0.065	5.592 (6.461)	93.592 (7.129)	0.817 (1.914)
Variance Decomposition of ΔS :					Variance Decomposition of ΔS :			
1	0.111	0.361 (0.675)	0.159 (0.496)	99.481 (0.763)	0.100	2.345 (2.749)	0.071 (1.389)	97.584 (3.023)
2	0.113	1.123 (1.020)	0.818 (1.380)	98.060 (1.609)	0.103	3.032 (2.930)	3.504 (8.367)	93.464 (8.520)
3	0.113	1.223 (1.106)	1.333 (2.046)	97.444 (2.292)	0.106	5.887 (4.230)	5.225 (11.970)	88.888 (11.260)
4	0.113	1.248 (1.126)	1.699 (2.533)	97.053 (2.788)	0.109	5.785 (4.422)	8.759 (12.521)	85.456 (12.113)
5	0.113	1.253 (1.128)	1.937 (2.864)	96.810 (3.128)	0.110	5.889 (4.552)	8.869 (12.735)	85.242 (12.328)
6	0.113	1.255 (1.127)	2.086 (3.095)	96.660 (3.366)	0.110	5.884 (4.510)	9.603 (12.819)	84.513 (12.517)
7	0.113	1.255 (1.125)	2.177 (3.258)	96.568 (3.534)	0.110	5.945 (4.567)	9.639 (13.087)	84.416 (12.925)
8	0.114	1.255 (1.123)	2.233 (3.377)	96.512 (3.657)	0.110	5.968 (4.588)	9.650 (13.329)	84.383 (13.313)
9	0.114	1.255 (1.122)	2.267 (3.464)	96.478 (3.747)	0.110	6.020 (4.65)	9.653 (13.661)	84.328 (13.739)
10	0.114	1.255 (1.121)	2.288 (3.531)	96.457 (3.816)	0.110	6.019 (4.690)	9.665 (13.948)	84.317 (14.108)

Developed economies

Variance Decomposition of ΔH (1 Lag):				
Period	S.E.	ΔH	ΔY	ΔS
1	0.012	100.000 (0.000)	0.000 (0.000)	0.000 (0.000)
2	0.014	86.087 (10.068)	13.105 (10.144)	0.809 (1.582)
3	0.016	66.787 (17.764)	32.584 (17.960)	0.629 (1.341)
4	0.019	50.755 (21.923)	48.767 (22.164)	0.478 (1.157)
5	0.021	39.410 (24.104)	60.217 (24.369)	0.373 (1.019)
6	0.024	31.500 (25.394)	68.199 (25.681)	0.302 (0.938)
7	0.026	25.830 (26.213)	73.918 (26.520)	0.252 (0.899)
8	0.029	21.625 (26.665)	78.161 (26.986)	0.215 (0.880)
9	0.032	18.407 (26.843)	81.407 (27.176)	0.186 (0.870)
10	0.034	15.879 (26.873)	83.956 (27.216)	0.164 (0.864)

Variance Decomposition of ΔY :				
1	0.038	0.020 (1.650)	99.980 (1.650)	0.000 (0.000)
2	0.057	0.331 (1.717)	99.664 (1.835)	0.005 (0.559)
3	0.073	0.681 (2.110)	99.306 (2.213)	0.014 (0.610)
4	0.088	0.948 (2.425)	99.031 (2.516)	0.020 (0.652)
5	0.102	1.140 (2.636)	98.835 (2.719)	0.025 (0.673)
6	0.115	1.278 (2.775)	98.693 (2.853)	0.029 (0.689)
7	0.128	1.379 (2.868)	98.590 (2.944)	0.031 (0.699)
8	0.142	1.455 (2.933)	98.512 (3.008)	0.033 (0.707)
9	0.155	1.513 (2.980)	98.452 (3.054)	0.035 (0.713)

10	0.169	1.559 (3.013)	98.405 (3.087)	0.036 (0.717)
Variance Decomposition of ΔS:				
1	0.099	0.735 (2.189)	0.356 (1.449)	98.910 (2.511)
2	0.102	1.309 (2.378)	1.403 (4.955)	97.288 (5.535)
3	0.103	1.286 (2.339)	3.074 (8.543)	95.639 (8.846)
4	0.104	1.265 (2.309)	5.104 (12.290)	93.631 (12.416)
5	0.105	1.264 (2.292)	7.369 (15.785)	91.367 (15.838)
6	0.106	1.270 (2.292)	9.801 (19.101)	88.929 (19.106)
7	0.108	1.282 (2.308)	12.366 (22.199)	86.352 (22.157)
8	0.110	1.297 (2.335)	15.043 (25.001)	83.660 (24.907)
9	0.112	1.313 (2.369)	17.819 (27.488)	80.868 (27.343)
10	0.114	1.331 (2.405)	20.681 (29.665)	77.988 (29.473)
Developing economies				
Variance Decomposition of ΔH (1 lag):				
1	0.047	100.000 (0.000)	0.000 (0.000)	0.000 (0.000)
2	0.052	98.293 (1.828)	1.532 (1.656)	0.175 (0.639)
3	0.053	96.398 (3.696)	3.410 (3.596)	0.192 (0.669)
4	0.054	94.917 (5.279)	4.887 (5.209)	0.196 (0.666)
5	0.054	93.923 (6.528)	5.881 (6.473)	0.196 (0.660)
6	0.054	93.296 (7.519)	6.508 (7.474)	0.196 (0.655)
7	0.055	92.913 (8.324)	6.891 (8.286)	0.196 (0.652)
8	0.055	92.681 (8.991)	7.124 (8.959)	0.195 (0.650)
9	0.055	92.541 (9.555)	7.263 (9.526)	0.195 (0.648)
10	0.055	92.457 (10.039)	7.347 (10.013)	0.195 (0.647)
Variance Decomposition of ΔH (3 lags):				
1	0.044	100.000 (0.000)	0.000 (0.000)	0.000 (0.000)
2	0.054	76.420 (14.047)	23.557 (14.134)	0.024 (0.745)
3	0.062	70.114 (14.999)	28.765 (14.536)	1.120 (2.683)
4	0.067	59.645 (16.966)	35.604 (17.534)	4.752 (5.214)
5	0.069	57.829 (17.479)	37.426 (18.077)	4.745 (5.013)
6	0.072	54.143 (18.955)	40.992 (19.865)	4.865 (4.948)
7	0.074	51.978 (19.325)	43.118 (20.265)	4.904 (5.073)
8	0.076	50.130 (20.093)	45.135 (21.152)	4.736 (4.963)
9	0.078	49.158 (20.300)	46.231 (21.332)	4.611 (4.964)
10	0.079	48.059 (20.945)	47.320 (22.066)	4.620 (5.065)
Variance Decomposition of ΔY:				
1	0.046	0.003 (0.584)	99.997 (0.584)	0.000 (0.000)
2	0.057	0.629 (1.282)	99.350 (1.339)	0.020 (0.472)
3	0.063	1.238 (2.029)	98.731 (2.068)	0.031 (0.542)
4	0.066	1.658 (2.545)	98.304 (2.571)	0.037 (0.576)
5	0.068	1.922 (2.886)	98.037 (2.903)	0.041 (0.592)
6	0.069	2.081 (3.113)	97.876 (3.125)	0.044 (0.601)
7	0.070	2.176 (3.268)	97.779 (3.277)	0.045 (0.607)
8	0.070	2.233 (3.377)	97.722 (3.384)	0.046 (0.610)
9	0.070	2.267 (3.456)	97.687 (3.461)	0.046 (0.613)
10	0.070	2.287 (3.514)	97.667 (3.518)	0.046 (0.614)
Variance Decomposition of ΔY:				
1	0.049	0.005 (1.822)	99.995 (1.822)	0.000 (0.000)
2	0.072	1.799 (3.657)	97.647 (3.901)	0.553 (1.085)
3	0.080	3.601 (4.927)	95.767 (5.526)	0.633 (1.807)
4	0.085	8.038 (7.008)	91.122 (7.822)	0.840 (2.281)
5	0.088	9.881 (7.545)	89.116 (8.541)	1.003 (2.676)
6	0.090	11.022 (8.068)	87.888 (9.000)	1.090 (2.918)
7	0.092	11.430 (8.294)	87.387 (9.248)	1.182 (2.986)
8	0.094	11.581 (8.518)	86.981 (9.543)	1.438 (3.201)
9	0.095	11.661 (8.600)	86.801 (9.725)	1.538 (3.368)
10	0.096	11.844 (8.763)	86.594 (9.892)	1.562 (3.565)
Variance Decomposition of ΔS:				
1	0.122	0.620 (1.087)	0.076 (0.606)	99.304 (1.288)
2	0.123	1.736 (1.702)	0.408 (1.546)	97.856 (2.390)
3	0.124	1.931 (1.869)	0.700 (2.161)	97.369 (3.059)
4	0.124	1.989 (1.927)	0.911 (2.602)	97.100 (3.524)
Variance Decomposition of ΔS:				
1	0.108	4.326 (4.682)	0.382 (2.180)	95.293 (5.236)
2	0.113	5.270 (4.431)	5.885 (9.449)	88.846 (9.769)
3	0.117	7.918 (6.115)	5.711 (10.479)	86.371 (10.086)
4	0.128	6.782 (6.085)	11.532 (11.407)	81.686 (11.108)

5	0.124	2.009 (1.948)	1.048 (2.927)	96.944 (3.860)	0.128	6.848 (5.900)	11.739 (12.391)	81.413 (12.290)
6	0.124	2.017 (1.958)	1.133 (3.176)	96.850 (4.114)	0.129	7.396 (5.721)	11.976 (12.883)	80.627 (12.954)
7	0.124	2.022 (1.964)	1.185 (3.372)	96.793 (4.312)	0.131	7.319 (5.825)	12.853 (13.789)	79.829 (13.916)
8	0.124	2.024 (1.968)	1.217 (3.530)	96.760 (4.471)	0.131	7.356 (5.898)	13.106 (14.828)	79.538 (14.975)
9	0.124	2.025 (1.971)	1.236 (3.658)	96.739 (4.600)	0.132	7.613 (5.990)	13.299 (15.532)	79.087 (15.829)
10	0.124	2.026 (1.974)	1.247 (3.765)	96.727 (4.707)	0.132	7.583 (6.125)	13.786 (16.647)	78.631 (16.980)

Economies in transition

Variance Decomposition of ΔH (1 lag):

Period	S.E.	ΔH	ΔY	ΔS
1	0.025	100.000 (0.000)	0.000 (0.000)	0.000 (0.000)
2	0.027	97.622 (14.369)	2.304 (14.546)	0.073 (2.387)
3	0.027	94.590 (19.625)	5.328 (19.819)	0.082 (2.685)
4	0.028	93.218 (21.324)	6.675 (21.467)	0.107 (2.717)
5	0.028	92.871 (22.126)	7.008 (22.254)	0.121 (2.743)
6	0.028	92.827 (22.923)	7.048 (23.075)	0.125 (2.817)
7	0.028	92.828 (23.599)	7.046 (23.776)	0.126 (2.869)
8	0.028	92.828 (23.972)	7.046 (24.155)	0.126 (2.874)
9	0.028	92.826 (24.152)	7.048 (24.333)	0.126 (2.864)
10	0.028	92.826 (24.351)	7.048 (24.529)	0.126 (2.864)

Variance Decomposition of ΔY :

1	0.047	0.161 (2.778)	99.839 (2.778)	0.000 (0.000)
2	0.060	9.436 (8.746)	89.789 (9.224)	0.775 (2.720)
3	0.064	15.294 (11.851)	83.759 (12.283)	0.947 (3.318)
4	0.065	17.459 (13.337)	81.561 (13.750)	0.980 (3.623)
5	0.065	17.950 (13.845)	81.068 (14.317)	0.982 (3.818)
6	0.065	17.997 (14.091)	81.022 (14.528)	0.981 (3.854)
7	0.065	17.991 (14.331)	81.028 (14.701)	0.981 (3.855)
8	0.065	17.991 (14.545)	81.027 (14.886)	0.981 (3.868)
9	0.065	17.993 (14.635)	81.025 (14.990)	0.981 (3.884)
10	0.065	17.995 (14.748)	81.024 (15.118)	0.982 (3.897)

Variance Decomposition of ΔS :

1	0.075	0.400 (2.872)	0.011 (2.521)	99.589 (3.691)
2	0.098	4.504 (5.813)	36.572 (19.227)	58.923 (18.886)
3	0.106	10.168 (8.172)	38.925 (18.705)	50.907 (20.008)
4	0.108	12.779 (10.036)	38.331 (19.295)	48.890 (21.222)
5	0.109	13.510 (10.848)	38.020 (19.845)	48.470 (22.156)
6	0.109	13.621 (11.250)	37.980 (20.361)	48.399 (22.846)
7	0.109	13.622 (11.673)	37.996 (20.605)	48.382 (23.299)
8	0.109	13.621 (12.104)	38.004 (20.716)	48.375 (23.585)
9	0.109	13.623 (12.341)	38.006 (20.810)	48.372 (23.750)
10	0.109	13.624 (12.437)	38.005 (20.890)	48.370 (23.820)

Notes: *H* indicates happiness, *Y* indicates income and *S* indicates sugar consumption and Δ indicates data at first difference. (.) indicates standard error run by Monte Carlo for 100 repetitions.

5. Conclusion

This study discovers the causal relationship among happiness, income and sugar consumption more comprehensively by using data of all 129 countries, and three economy groups, namely developed economies, developing economies, and economies in transition. This study adds fresh insights to the existing literature, with the main finding, that income causes happiness which the latter further causes sugar consumption, in general for all countries. Similar finding is found for the developing economies. For the developed economies, only from income leads to happiness. For economies in transition, happiness causes income, and the latter then causes sugar

consumption. In addition, both the impulse response and variance decomposition analyses further enhance these findings with some feasible interpretations. This study aligns with previous studies which conclude that income causes (effects) happiness including the Easterlin Paradox, which suggests that income has a positive effect on happiness up to a certain threshold. This also emphasises the importance of economic factors in overall well-being.

This study is relevant for policy implications, in particular to raise their income which is the core cause of happiness. Also, in general, to control the sugar consumption, happiness needs to be given up (while income only applies to economies in transition) because over consumption of sugar increases the risk of a variety of chronic diseases (i.e. obesity, cardiovascular disease, diabetes and non-alcoholic fatty liver disease (NAFLD) as well as cognitive decline and even some cancers) (Rippe & Angelopoulos, 2016). Additionally, policymakers should prioritize economic growth and development as part of efforts to improve happiness and well-being, particularly in economies in transition. Policies and interventions aimed at improving well-being should consider long-term perspectives and address the reciprocal relationship between happiness and income. Also, policymakers can consider income-related interventions and policies that aim to improve overall well-being and happiness. These findings can help in planning strategies for poverty alleviation, income redistribution, and economic development that take into account the potential impact on individuals' happiness.

There are three immediate drawbacks in this study. Firstly, the short panel data consists of 5 years of time dimension which diminishes its validity. Future studies might consider a longer timeframe especially, earlier happiness data, and the latest sugar consumption data, in order to capture more time dynamics. Secondly, only three variables – happiness, income, and sugar are included for simplicity reason, which may ignore other potential [macroeconomic] variables those cause happiness (or sugar consumption). The 'other' macroeconomic variables that influence happiness among them are unemployment rate, and inflation rate. While factors affecting sugar consumption are consumer behaviour, income distribution, population growth, and so on. Further study has to consider them including other social, cultural, and individual factors that contribute to happiness across different contexts.

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Appendix

Appendix A. Selected sample countries.

Development Status	Countries
Developed economies (35 countries)	Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States.
Developing economies (79 countries)	Afghanistan, Algeria, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Chad, Chile, China, Colombia, Congo (Brazzaville), Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Ghana, Guatemala, Guinea, Haiti, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Liberia, Libya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, South Africa, South Korea, Sri Lanka, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, United Arab Emirates, Uruguay, Vietnam, Zambia, Zimbabwe.
Economies in transition (15 countries)	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Montenegro, Russia, Serbia, Tajikistan, Ukraine, Uzbekistan.

Appendix B. The results of Granger non-causality (block exogeneity) tests.

Null Hypothesis:	1 Lag	3 Lags
All 129 countries		
$\Delta Y \neq \Rightarrow \Delta H$	5.441 (0.020)**	10.658 (0.014)**
$\Delta S \neq \Rightarrow \Delta H$	0.246 (0.620)	4.962 (0.175)
$\Delta Y \ \& \ \Delta S \neq \Rightarrow \Delta H$	5.514 (0.064)*	16.585 (0.011)**
$\Delta H \neq \Rightarrow \Delta Y$	0.589 (0.443)	2.884 (0.410)
$\Delta S \neq \Rightarrow \Delta Y$	0.110 (0.745)	2.359 (0.501)
$\Delta H \ \& \ \Delta S \neq \Rightarrow \Delta Y$	0.649 (0.723)	4.778 (0.573)
$\Delta H \neq \Rightarrow \Delta S$	3.863 (0.049)**	5.117 (0.164)
$\Delta Y \neq \Rightarrow \Delta S$	1.340 (0.247)	2.148 (0.542)
$\Delta H \ \& \ \Delta Y \neq \Rightarrow \Delta S$	5.364 (0.068)*	7.099 (0.312)
Developed economies		
$\Delta Y \neq \Rightarrow \Delta H$	3.084 (0.051)*	
$\Delta S \neq \Rightarrow \Delta H$	1.034 (0.309)	
$\Delta S \ \& \ \Delta Y \neq \Rightarrow \Delta H$	5.121 (0.077)*	
$\Delta H \neq \Rightarrow \Delta Y$	2.296 (0.130)	
$\Delta S \neq \Rightarrow \Delta Y$	0.011 (0.918)	
$\Delta H \ \& \ \Delta S \neq \Rightarrow \Delta Y$	2.301 (0.317)	
$\Delta H \neq \Rightarrow \Delta S$	0.825 (0.364)	
$\Delta Y \neq \Rightarrow \Delta S$	0.323 (0.570)	
$\Delta H \ \& \ \Delta Y \neq \Rightarrow \Delta S$	1.736 (0.420)	
Developing economies		
$\Delta Y \neq \Rightarrow \Delta H$	2.453 (0.117)	6.557 (0.087)*
$\Delta S \neq \Rightarrow \Delta H$	0.437 (0.509)	6.002 (0.112)
$\Delta Y \ \& \ \Delta S \neq \Rightarrow \Delta H$	2.699 (0.259)	12.779 (0.047)**
$\Delta H \neq \Rightarrow \Delta Y$	2.604 (0.107)	4.831 (0.185)
$\Delta S \neq \Rightarrow \Delta Y$	0.066 (0.798)	2.699 (0.440)
$\Delta H \ \& \ \Delta S \neq \Rightarrow \Delta Y$	2.605 (0.272)	6.285 (0.392)
$\Delta H \neq \Rightarrow \Delta S$	3.190 (0.074)*	4.215 (0.239)
$\Delta Y \neq \Rightarrow \Delta S$	0.486 (0.486)	2.517 (0.472)
$\Delta H \ \& \ \Delta Y \neq \Rightarrow \Delta S$	3.635 (0.162)	6.568 (0.363)
Economies in transition		
$\Delta Y \neq \Rightarrow \Delta H$	0.142 (0.707)	
$\Delta S \neq \Rightarrow \Delta H$	0.036 (0.850)	
$\Delta Y \ \& \ \Delta S \neq \Rightarrow \Delta H$	0.203 (0.904)	
$\Delta H \neq \Rightarrow \Delta Y$	6.044 (0.014)**	
$\Delta S \neq \Rightarrow \Delta Y$	0.528 (0.468)	
$\Delta H \ \& \ \Delta S \neq \Rightarrow \Delta Y$	6.485 (0.039)**	
$\Delta H \neq \Rightarrow \Delta S$	2.562 (0.109)	
$\Delta Y \neq \Rightarrow \Delta S$	3.366 (0.067)*	
$\Delta H \ \& \ \Delta Y \neq \Rightarrow \Delta S$	4.757 (0.093)*	

Notes: H indicates happiness, Y indicates income and S indicates sugar consumption and Δ indicates data at first difference. The reported value in (.) is p-value. The symbol, “ $\neq \Rightarrow$ ” stand for “does not Granger cause”. ***p-value < 0.01; **p-value < 0.05; *p-value < 0.1., rejected the null hypothesis that Y variable does not Granger cause X variable.

Issues and Perspectives in Business and Social Sciences

The revelations of *kuih peneram* among young generations

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Abstract

In the rapidly evolving Malay community, the younger generations seem to be gradually losing touch with the rich heritage of traditional Malay *kuih*. The uniqueness of traditional Malay *kuih* lies in its versatility, as it can be served in any course of meals, as an appetiser, dessert, or even as a snack. The term 'traditional Malay *kuih*' is broad, encompassing various sizes and methods of preparation, each bears dynamic flavours, either sweet or savoury. This study investigates the younger generations' level of knowledge of *kuih peneram*, from its general knowledge to the process of making it. The study involves seven informants from the younger generations and five *kuih peneram* entrepreneurs. Adopting a qualitative approach, the data collected were subjected to content analysis. The primary objective of this investigation is to gain insights into the knowledge and proficiency of the younger generations concerning the art of making *kuih peneram*.

Keywords:

young generation;
kuih peneram;
entrepreneurs;
traditional food;
appetiser.

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1. Introduction

Malaysia is renowned for its beauty as it embraces harmony and peace among its diverse population, comprising of 80 ethnic groups, with Malays, Indians, Chinese, and others forming the majority (Rashid, 2021). This multi-racial country boasts a rich variety of heritage foods that align with their respective ethnic categories (Raji et al., 2017; Rashid, 2021). Each ethnic group in the nation maintains its distinct practices and beliefs, with traditional foods holding a crucial symbol of heritage that is passed down to the current generation (Di Pietro, 2018; Zahari et al., 2013). Moreover, food plays a vital role in shaping communal identity, encompassing interests, religion, ethnicity, locality, and citizenship (Batat, 2021; Perry, 2017).

The cultural diversity and coexistence of races in Malaysia have contributed to the nation's wealth of cultural practices and traditions (Rahman et al., 2018). Food has been acknowledged as a crucial element in the country's culture and heritage. Through their unique culinary identities, societies often enjoy sharing their cultural heritage with others. Traditional food not only reflects an individual's identity, traditions, and lifestyle but also plays a pivotal role in shaping their preferences and behaviours, often established during childhood through family

practices (Rahman et al., 2018). Therefore, preserving the practice of making and appreciating traditional food among the younger generations is essential, as it significantly impacts their future behaviours and food choices, particularly when these traditions are nurtured at home. Research by Sharif et al. (2016) and Shipman (2020) highlights that excessive exposure to ready-to-eat foods diminishes the younger generation's interest in traditional foods. To address this issue, it is crucial to break this trend and ensure that knowledge of traditional foods remains prevalent among the younger generations by widely promoting heritage foods. In the present day, many young individuals tend to disregard each other's traditional food cultures in favour of commercial or modern food choices (De Mooij, 2019; Nor et al., 2012; Raji et al., 2017). However, it is essential to note that not everyone overlooks their heritage food, as there are younger generations who genuinely care about it and continue to appreciate these culinary traditions. Nevertheless, an increasing number of young individuals are facing a lack of cooking skills and are gradually losing touch with their cultural culinary heritage (Mokthar et al., 2022; Zahari et al., 2013).

Kuih peneram, a traditional delicacy, has been selected as the subject of this research. Kuih peneram, which origin can be traced to Tamil Nadu, India is a traditional kuih associated with the Malay ethnic group. The reason why kuih peneram is chosen as the subject of the study is due to its adaptation to contemporary times and its ability to navigate the challenges presented by the changing world, The main focus is on its role in preserving cultural heritage, which is appreciated not only for its sensory and culinary aspects, but also its contribution in safeguarding cultural heritage. In modern times, adaptations of kuih peneram are facing the challenges that threaten both preservation and promotion. Kuih peneram have their own unique taste and method of preparation; however, as societal dynamic change and food preferences evolve, there is a growing risk that this traditional delicacy might become marginalised, lost, or modified to an extent that its original essence is compromised. This gap hinders a thorough understanding of its historical context, and this also includes lack of historical records and documentation. Addressing these gaps is crucial in understanding kuih peneram's significance and ensuring its survival. Furthermore, this study aims to bridge the gap in the younger generation's knowledge of traditional heritage food, which has been observed to be waning in practice. The reasons for the decline in the disclosure of heritage food are attributed to the lack of interest among the youth in traditional cuisine and the fact that their parents may not prepare it at home (Rahman et al., 2022, p. 190 - 206).

Based on the issues discussed above, three objectives and three research questions were developed as follows:

R01: To identify the level of knowledge about *kuih peneram* among young generations.

RQ1: How the knowledge of kuih peneram can influence the knowledge of heritage foods among young generations?

R02: To identify the level of knowledge about the production of *kuih peneram* among young generations.

RQ2: How the production of kuih peneram can influence the knowledge of heritage foods among young generations?

R03: To introduce the process of preparation of *kuih peneram* among young generations.

RQ3: How the process preparation of making traditional kuih can influence the knowledge of heritage foods among young generations.

2. Literature review

The history of kuih peneram traces back to Tamil Nadu, India, where it is known as adhirasam (Edrus, 2018; Zieman, 2014). Adhirasam holds a special place in Indian tradition, especially during the Deepavali festival, where it is celebrated as the 'king of sweets.' Families in the village make this sweet delicacy to be sent as gifts to their married daughters, creating a cherished family tradition (Anantharam, 2020). Adhirasam's popularity extends beyond family celebrations; it is revered as an offering to the gods in both homes and temples, further solidifying its cultural significance (Malaysian Indian News, 2014; Selan, 2021). The preparation of Adhirasam and kuih peneram involves several ingredients. However, a key difference lies between the two: the Indian version incorporates dried ginger powder and cardamom, along with rice flour and brown sugar, whereas kuih peneram simplifies the recipe, using only rice flour and palm sugar (Ramesh, 2021).

Inspired by adhirasam, kuih peneram takes its first roots among the Malays in North Malaysia (Ibrahim, 2020). Synonymous names such as denderam or peniaram are used to describe this beloved fried kuih, cherished by Malay households and popular in the Malaysian market (Tun Razak Exchange, 2019). In the eastern coast of Peninsular Malaysia, it is also known as 'kuih cuping telinga' due to the shape and taste (Malaysian Indian News, 2014; Selan, 2021). The delectable taste and charming appeal of kuih peneram have earned it a special place in the hearts of all generations, making it a beloved favourite since ancient times and remains popular even today (Ibrahim, 2020). Interestingly, during the era of Melaka, this kuih was referred to as 'kuih telinga keling,' with 'keling' derived from the name 'Kalinga,' a district on the East Coast of India, now known as Odissa (ErenaTakeuchi, 2019). The term 'keling' is also associated with the sound of bells from Indian temples during prayers and finds its place in historiographies, evident in names like Tanjung Keling in Melaka and the Kapitan Keling Mosque in Penang.

2.1 The ingredients of kuih peneram

Kuih peneram, a delectable traditional Malay delicacy, is crafted from a simple yet flavourful combination of rice flour, wheat flour, palm sugar, cooking oil, salt, and water. Among these ingredients, the key players are rice flour and palm sugar, which impart the distinct taste and texture to the kuih. To achieve a truly delightful dough, the process involves fermenting it for about 30 minutes or up to a day, depending on the desired flavour intensity and consistency. This fermentation step is crucial as it allows the ingredients to meld together, resulting in a harmonious and delicious final product. For the best outcome, it is essential to use high-quality ingredients when preparing kuih peneram. Opting for superior rice flour and fresh, authentic palm sugar will not only enhance the taste but also contribute to the kuih's longevity, ensuring it remains delightful and durable for an extended period.

2.1.1 Rice flour

The main ingredient in making kuih peneram is rice flour. According to Hartley (2017) and Wu et al. (2019), rice flour is a type of flour made from finely ground rice and is commonly used for gluten-free baking, particularly in industrial baking operations. There are two types of rice, namely brown rice and white rice. Both types are derived from the same grain; what distinguishes the two is the milling process, which removes the husk, bran, and germ of the rice in white rice (Zamri, 2020). Rice flour is a staple food in Southeast Asia, Japan, and India, and it is rich in nutrients. Brown rice flour contains higher levels of B vitamins compared to white rice flour. This is because brown rice retains its outer skin during the grinding process, while white rice's husk is discarded. The brown rice husk contains essential nutrients such as fibre, vitamins, and minerals like calcium and zinc, making it more nutritious (Longvah & Prasad, 2020).

2.1.2 Palm sugar

Sugar is the second ingredient in the preparation of *kuih peneram*. It serves as a source of sweetness in every dish. Without sugar, this traditional *kuih* would not be complete as a dessert. In the market, there are several types of sugar available, such as palm sugar, brown sugar, icing sugar, castor sugar, refined sugar, and granulated sugar. Each type of sugar has its differences and specific uses in cooking (Sukarno, 2022). Palm sugar is one of the products derived from coconut crops, widely cultivated around the world, especially in the islands of the Asia Pacific and tropical regions. Indonesia is reported to be the largest producer of palm sugar globally (Hosnan, 2011; Septianie, 2022).

2.1.3 Wheat flour

According to Rattray (2021), wheat flour is a powder made from grinding wheat, commonly used for human consumption in food manufacturing. There are different types of wheat flour that differ in the amount of gluten content, colour, portion of grain used, and type of wheat. Most conventional flours are made from wheat grains, which consist of endosperm, germ, and bran (MasterClass staff, 2021). Wheat flour plays a vital role as an important ingredient in manufacturing foods like bread, cakes, biscuits, and most baked goods. Wheat, a type of grass plant, produces grains encased in paper husks, while flour is obtained through the process of grinding wheat using two methods: milling stones and milling rollers (Razon, 2021). As reported by Cherfas (2015) and Florindi (2021) in Paleolithic times, hunter-gatherers used stones as a combination of a pestle and grinder to make flour from oats and other grains. This method represents the earliest evidence of food processing in ancient times.

2.2 The preparation of *kuih peneram*

Kuih peneram can often be found at roadside stalls and night markets, sold in various places and at different times. However, as reported by Roff (2021), the taste of store-bought *kuih peneram* might not live up to expectations due to an excessive amount of flour, resulting in the *kuih* absorbing too much oil and becoming hard when cold. The article further highlights that authentic *kuih peneram* should have a brown colour and be fried briefly in hot oil to achieve a soft and fluffy texture. To maintain the *kuih*'s delightful appearance and its crunchy and fluffy texture, it is essential to follow the right procedures and use appropriate equipment during its preparation.

2.3 Traditional way of making *kuih peneram*

As history specifies, *adhirasam* is a *kuih* that predates *kuih peneram*. The process of making *adhirasam* is similar to *kuih peneram*, but it involves additional ingredients such as ginger and cinnamon powder (Shada, 2019). However, for *kuih peneram*, the main ingredients are rice flour and palm sugar. In the traditional Indian cake *adhirasam*, rice is soaked for two hours and then finely ground into a flour texture (Priya, 2018). On the other hand, for *kuih peneram*, a combination of rice flour and wheat flour is used.

The preparation of *adhirasam* involves making jaggery sugar and testing its consistency by creating "softballs" in a water-filled bowl. The sugar water should be soft, not hard, and should not dissolve in water. Achieving a soft *adhirasam* entails testing and adjusting the sugar water consistency before adding it to the rice flour mixture (Venkatachalam, 2019). Meanwhile, for *kuih peneram*, palm sugar is dissolved in water and then added to the flour mixture, blending until well combined (Affandi, 2022; Team, 2016). Both doughs, for *adhirasam* and *kuih peneram*, are then fermented for 8 hours to achieve the desired texture. After fermentation, the dough is kneaded and applied using moulds (Affandi, 2022; Priya, 2018). Subsequently, the dough is fried

in hot oil to prevent sticking. As Venkatachalam (2019) explains, when adhirasam is cooked, it rises in the oil. Similarly, kuih peneram rises and needs to be frequently flipped to ensure even cooking.

3. Methodology

Sampling design is a crucial process for researchers to obtain samples from a particular population, and it involves selecting items or individuals for the study sample (Gill, 2020). The researchers had to choose a reliable and suitable sample design for their study. Sampling techniques were broadly classified into two types: probability sampling and non-probability sampling (Taherdoost, 2016; Yadav, 2019). For this study, non-probability sampling, specifically convenience sampling, was used. Convenience sampling allowed the researcher to select samples that were easily accessible and close to the data collection location (Etikan et al., 2016; Saunders & Townsend, 2018). This sampling method was simple, affordable, and provided readily available samples (Etikan et al., 2016; Shaheen & Pradhan, 2019).

Comparatively, the sample size in qualitative research was smaller compared to quantitative research. Kalu and Bwalya (2017) and Sim et al., (2018) emphasised that certain phenomena are considered valid in qualitative research if they appeared at least once in the data. This characteristic allowed qualitative research to focus on understanding the unique aspects of the data without the need for providing estimates or determining statistically significant discriminatory variables (Basias & Pollalis, 2018). Unlike quantitative research, qualitative studies lacked a set rule for determining the required sample size (Sim et al., 2018; Baker & Edwards, 2012). However, some researchers offered suggested sample sizes as general guidelines. For instance, Lewis (2015) and Rahi et al. (2019) suggested a sample size between 5 and 30, while Kumar et al. (2020) recommended a similar range of 5 to 25.

Majid et al. (2018) argued that aiming for a larger sample size in qualitative research might compromise the data's quality as it could be challenging for the researcher to conduct a thorough and high-quality study with a vast amount of data. To address this concern, Islam and Aldaihani (2022) introduced another approach to sample size in qualitative studies. This study aimed to reach the point of saturation during data collection. Data collection ceased once the researchers identified that the final transcript of the interview series yielded comparable conclusions, indicating that the saturation point had been reached (Islam & Aldaihani, 2022). To gather information from the informants, this study utilised both semi-structured in-depth interviews and structured interviews. This combination of elements allowed for data to be compared and provided flexibility in asking follow-up questions to informants based on the stated objectives of the study. The informant selection for this study is done randomly. Random sampling helps reduce bias in the selection process, minimizing the potential for researchers to inadvertently introduce their own biases into the sample selection (Etikan, & Babtope, 2019; Taherdoost, 2016). Data collection was through semi-structured face-to-face interviews with both young generations and business owners of kuih peneram. Each interview had a duration between 45 and 60 minutes. The interviews were transcribed verbatim and analysed using thematic analysis techniques. The theme codes for this study are (i) general knowledge about kuih peneram, (ii) level of knowledge about kuih peneram, (iii) level of knowledge about the production of kuih peneram, (iv) introduce the process of preparation of kuih peneram.

For this study, researchers were engaged with two groups of informants: the young generations and the entrepreneurs. Two separate sets of questions were developed accordingly. For the first set of questions targeted for young generations of informants, the initial step involved inquiries concerning demographics, including gender, age, marital status, and education level. The purpose

was to gather background information about the participants. Subsequently, these findings were compared and evaluated to discern individual response disparities. The second section of questions pertained to informants' general knowledge about kuih peneram. The purpose was to find out their level of knowledge about the appreciation of this heritage kuih. Moving to the third section's questions, the aim was to expand their understanding and pique their interest in preparing kuih peneram. The questions were based on the first research objective. Finally, the fourth section pertained to the second objective, which aimed to investigate the level of knowledge among younger generations in Malaysia regarding the production of kuih peneram.

Transitioning to the second set of questions, these were designed for informant business owners of kuih peneram establishments. These questions were formulated in accordance with the third research objective, which aimed to introduce the process of preparing kuih peneram to younger generations and increase their knowledge of making this traditional dessert. Table 1 provides an overview of the interview questions employed throughout the study.

Table 1: Interview questions and objectives

SET ONE - Young generation informant group		
Section	Objectives	Question
One	To assess informants' demographic background	<ol style="list-style-type: none"> 1. What is your gender? 2. How old are you? 3. What is your ethnicity? 4. What is your level of education?
Two	To assess informants' general knowledge about kuih peneram among young generations	<ol style="list-style-type: none"> 1. What is your knowledge of <i>kuih peneram</i>? 2. Have you tried <i>kuih peneram</i> before? 3. How did you become aware of <i>kuih peneram</i>? 4. In your opinion, what are the cooking methods used to make <i>kuih peneram</i>?
Three	To achieve research objective 1 RO1: To identify the level of knowledge about kuih peneram among young generations	<ol style="list-style-type: none"> 1. Do you know the ingredient used to prepare <i>kuih peneram</i>? 2. Are you familiar with the method used to prepare this <i>kuih</i>? 3. What is another term for <i>kuih peneram</i> that you know? Name it. 4. Do you believe this <i>kuih</i> is unique? Why?
Four	To achieve research objective 2 RO2: To identify the level of knowledge about the production of kuih peneram among young generations	<ol style="list-style-type: none"> 1. Do you understand how to prepare <i>kuih peneram</i>? 2. Do you believe that <i>kuih peneram</i> is made in the same method as other traditional <i>kuih</i>? 3. Do you believe that the procedure for preparing this <i>kuih</i> is difficult? Why? 4. Provide some examples of utensils or equipment that you are familiar with for preparing <i>kuih peneram</i>.
SET TWO - Business owners of the kuih peneram establishments		
Section one	To achieve research objective 3 RO3: To introduce the process preparation of kuih peneram among young generations	<ol style="list-style-type: none"> 1. When is the right time to eat this <i>kuih peneram</i>? 2. How long can <i>kuih peneram</i> last? 3. What causes the <i>kuih peneram</i> to not get the right texture during the process of preparation? 4. Will the use of different ingredients have an effect on the taste of the <i>kuih peneram</i>?

5. Findings and results

A total of 12 informants were involved in this study, and among them were 5 kuih peneram entrepreneurs who were interviewed as informants. Therefore, the data interpretation

presented in this section will be explained in detail, based on the answers provided by the informants concerning the study's objectives.

4.1 Demographic profile

Questions in section one assessed informants' demographic background among the younger generations. Out of the total participants, 5 were female, and 2 were male. The informants' ages were divided into two groups: 5 individuals were in the 23 to 24-year-old range, and 2 were in the 28 to 33-year-old range. The survey included questions to determine the level of education among the informants, and it was found that all of them had completed their undergraduate studies.

4.2 General knowledge about kuih peneram

In section two researchers assessed informants' general knowledge about kuih peneram among young generations. Insight into the general knowledge of kuih peneram are presented as below.

Product knowledge: Three of the informants were aware of this traditional dessert through their family members and experienced it when they first tasted it for the first time in their hometowns. On the other hand, one informant associated kuih peneram with being commonly given as door gifts during feasts. The responses of others reveal diverse sources of awareness and experiences related to this traditional Malaysian delicacy, showcasing its cultural significance and popularity among different informants.

Experiences: When considering the informants' experiences, they tried the kuih peneram. Six informants have tried this traditional dessert at night markets, where it is available in various shapes and textures, such as round, flower-shaped, and '8' shaped. The informants commonly described the kuih's texture as crispy on the outside and soft on the inside. One informant also encountered kuih peneram as door gifts during feasts. Overall, the data indicates that kuih peneram is widely available and enjoyed by the informants in various settings, showcasing its popularity and versatility.

Discovering of kuih peneram: Insights into how the informants became aware of kuih peneram. Five informants discovered the kuih at night markets, where they observed the entire process of rolling, moulding, and frying it on the spot. This experience attracted their interest in trying kuih peneram, especially when it was sold hot. Additionally, two informants mentioned receiving kuih peneram as door gifts at parties and feasts, while others were introduced to it by family members. Overall, the night market emerged as a significant place of discovery and appeal for kuih peneram among the informants.

Opinions of cooking method: About the informants' opinions on the cooking method used to make kuih peneram. The majority of them indicated that the traditional method of kuih peneram involved deep-frying. Two informants mentioned that frying is the primary technique used, while others suggested the possibility of exploring new approaches, such as baking with an oven, particularly for commercial purposes. One informant described a unique method involving boiling water with palm sugar and mixing it with flour to form the dough. Overall, the responses emphasise the significance of frying as the predominant cooking method for making kuih peneram, with some consideration for potential innovations. Table 2 notes responses for general knowledge about kuih peneram.

4.3 Level of knowledge about kuih peneram

In this section, (section three), the aim of the study is to achieve research objective one; To identify the level of knowledge about kuih peneram among young generations. Insight into the level of knowledge about kuih peneram are presented as follows:

Table 2: Informants' general knowledge about kuih peneram

Interview questions	Selected responses
What is your knowledge of kuih peneram?	<p><i>Usually, this kuih is used as a door gift for weddings, sold in the market in the morning, afternoon, and night. In addition, this kuih peneram also has its own franchise to be distributed to vendors for sale – Informant 3</i></p> <p><i>"I know this kuih when I was little, and it is my favourite kuih. I tried it in Johor for the first time and at that time it was known as kuih teliga keling" - Informant 6</i></p>
Have you tried kuih peneram before?	<p><i>"I have tried it in the states of Selangor, Melaka, Johor, and Perlis. It has various shapes like flowers, round, '8' shape and the same colour which is dark" - Informant 6</i></p> <p><i>"I always eat this kuih peneram at night markets and roadside shops" - Informant 7</i></p>
How did you become aware of kuih peneram?	<p><i>"Most of the kuih peneram that I often find are in roadside shops and at gas stations where the kuih peneram seller is likely to put them there" - Informant 1</i></p> <p><i>"I find a lot of fresh kuih peneram which is after fried in the night market, and usually the restaurants that are from the vendors sell in packets" - Informant 6</i></p>
In your opinion, what are the cooking method used to	<p><i>"From my point of view, it uses frying techniques to cook kuih peneram, besides that they use other initiatives such as baking if they want to be commercialised on a large scale" Informant 2</i></p> <p><i>"The cooking method used is frying, and it is possible that in the future there will be people who can find new initiatives to cook this traditional kuih, such as baking using an oven" - Informant 5</i></p>

Knowledge about kuih peneram ingredients: Reveals informants' knowledge of the ingredients used in making kuih peneram. Six of the informants were well aware of the basic components, which include rice flour, wheat flour, brown sugar, and water. However, one informant was unsure about the ingredients and could only recall that flour is used. Overall, the responses demonstrate a general understanding of the key ingredients, with only one informant expressing uncertainty.

Familiarity with kuih peneram preparation method: Insights into the informants' familiarity with the preparation method of kuih peneram. The majority of them exhibited a commendable understanding of the entire process, eloquently explaining the steps from mixing the ingredients to the frying stage. Their responses reflect a genuine grasp of how to make kuih peneram. However, the table also highlights informants who were less acquainted with the process. One informant had no prior experience in making the kuih, while another expressed uncertainty. This diversity in knowledge and experience among the informants emphasises the need for comprehensive exploration and understanding of this traditional delicacy.

Diverse names for kuih peneram: The finding reveals the diverse names used by the informants to refer to kuih peneram. The most popular alternative term among the younger generations is 'kuih telinga keling.' Additionally, the name 'kuih denderam' is recognised and associated with Negeri Sembilan. The informants' responses demonstrate the cultural richness and regional variations surrounding this traditional delicacy. Overall, the table showcases how kuih peneram holds multiple identities, reflecting its significance and popularity in different regions of Malaysia.

Perception of kuih peneram's uniqueness: The finding reveals the informants' unanimous agreement on the uniqueness of kuih peneram. They find it distinctive due to its various shapes, such as round, '8', and flower, as well as its crispy exterior and soft interior texture. The kuih's ease of preparation with readily available ingredients and equipment adds to its charm. Additionally, its popularity as a party door gift and a delightful afternoon tea snack further emphasises its special status. The informants' responses collectively showcase the captivating appeal and cultural significance of kuih peneram as a cherished traditional delicacy. Table 3 shows informants' level of knowledge about kuih peneram.

Table 3: Informants' level of knowledge about kuih peneram

Interview questions	Selected responses
Do you know the ingredient used to prepare kuih peneram?	<p><i>"The ingredients used are simple with only three or four ingredients which are brown sugar, rice flour, water, and granulated sugar" - Informant 3</i></p> <p><i>I'm not sure about the ingredients used, but I know one of the ingredients - Informant 6</i></p>
Are you familiar with the method used	<p><i>"The method of frying traditional kuih that I often see is the same as Javanese cucur kuih and keria" - Informant 1"</i></p> <p><i>"I'm not sure how to make kuih peneram" - Informant 6</i></p>
What is another term for kuih peneram that you know? Name it.	<p><i>"I recognise this kuih from the name of kuih telinga keling in the states of Perak and Melaka, the name of kuih denderam is used in Negeri Sembilan" - Informant 2</i></p> <p><i>"I used to call it by the name kuih teliga keling also known as kuih denderam" - Informant 5</i></p>
Do you believe this kuih is unique? Why?	<p><i>"It is unique because it looks like a doughnut, but it has a different taste and texture. The texture of the doughnuts is fluffy, but for kuih peneram the batter is crispy on the outside. In terms of manufacturing, kuih peneram needs to be fermented first to absorb the taste of sugar"- Informant 4</i></p> <p><i>"This kuih peneram is unique because of its texture that is crispy on the outside and soft on the inside. If the thickness is thick, it will cause the inside to be undercooked, so I prefer the outside to be crispy and the inside to be soft"- Informant 7</i></p>

4.4 Level of knowledge about the production of kuih peneram

For section four, the aim of the study is to achieve Research Objective Two; To identify the level of knowledge about the production of kuih peneram among young generations. Analysis into the level of knowledge about the production of kuih peneram are presented as below:

Preparation process: For the range of perspectives on the preparation of kuih peneram, three informants demonstrated a clear understanding of the process, mentioning boiling water, sugar, adding flour, kneading, rolling, moulding, and frying. The significance of fermenting the batter for a better taste was also highlighted by one informant. On the other hand, three informants admitted uncertainty, yet all acknowledged the skill and patience needed for crafting this traditional delicacy. Overall, the responses showcase the diverse approaches and craftsmanship involved in making kuih peneram.

Comparison process with other traditional kuih: Informants' perspectives on whether kuih peneram shares the same preparation method as other traditional kuih. Two informants asserted that each kuih has its own unique way of preparation and techniques, necessitating careful adherence to ensure proper cooking. They emphasised the individuality of each delicacy. On the other hand, five informants noted similarities, particularly in the frying method, but also recognised differences in textures and overall preparation. The diverse viewpoints highlight the richness and complexity of Malaysia's traditional kuih culture, where each delicacy holds a

special place with distinct flavours and cultural significance. Overall, the responses reveal a deep appreciation for the artistry and diversity within traditional kuih making and the pride in preserving their unique heritage.

Perceived difficulty of preparation: The informants hold varying perspectives on the difficulty of preparing kuih peneram. Five informants considered the procedure relatively simple, involving the mixing ingredients and kneading into a dough. They emphasised the importance of skill and patience during the process. However, one informant mentioned certain complexities, particularly during the time-consuming frying and fermentation stages. Culinary expertise may influence the perceived difficulty, and inexperienced individuals might find it more challenging. On the other hand, only one informant was not sure of the difficulty level due to lack of knowledge on preparing kuih peneram. Overall, the responses offer valuable insights into the diverse experiences and perceptions surrounding the preparation of this traditional Malaysian delicacy.

Knowledge of utensils and equipment used: This passage analyses insights into the informants' familiarity with the utensils and equipment used in the preparation of kuih peneram. Six informants consistently mentioned vital tools such as frying pans, ring moulds, and rolling pins. Only one informant described traditional techniques that exclusively relied on fingers, where no tools were used, only fingers to create holes in the portioned dough. Overall, the informants possess knowledge of the utensils and equipment used. This shared knowledge reflects the cultural importance and practicality of making this cherished Malaysian delicacy. Table 4 indicates informants' level of knowledge about the production of kuih peneram.

Table 4: Informants' level of knowledge about the production of kuih peneram

Interview questions	Selected responses
Do you understand how to prepare kuih peneram?	<p><i>"From what I know, the way to prepare it is simply because you mix all the ingredients at once and the rolling process after frying. For example, water and melaka sugar need to boil and then add the dry ingredients and stir until combined. It also doesn't need to be fermented before baking" - Informant 3</i></p> <p><i>"I'm not sure how to prepare kuih peneram, but in my observation, the dry ingredients will be added to water and sugar, then knead until it becomes a dough" - Informant 7</i></p>
Do you believe that kuih peneram is made in the same method as other traditional kuih?	<p><i>"For me, these traditional kuih have their own way of preparation and it is necessary to follow the right way to make sure the kuih is cooked thoroughly, therefore, not all the methods used are the same" - Informant 1</i></p> <p><i>"I believe it is made the same as other kuih such as kek sarang lebah but it is different from the texture because the kuih peneram needs to be rolled but the kek sarang lebah is like batter" - Informant 2</i></p>
Do you believe that the procedure for preparing this kuih is difficult? Why?	<p><i>"I think it is not difficult to produce this kuih because it uses ingredients that are easily available, it is also easy to store but using the right technique and method of preparation" - Informant 2</i></p> <p><i>"For me, the preparation of this kuih peneram is not difficult because I studied the culinary field, but it may be difficult for inexperienced people to make it" - Informant 7</i></p>
Provide some examples of utensils or equipment that you are familiar with for preparing kuih peneram.	<p><i>"Among the materials used are moulds. There are many types of moulds such as moulds made of plastic, aluminium, and copper. if you do not use a mould, you can also use a cup as a kuih ring mould according to the desired size. In addition, using a rolling pin to roll the kuih peneram" - Informant 2</i></p> <p><i>"For the traditional way, it is very easy because you only use your fingers to make holes without using tools" - Informant 3</i></p>

4.5 Introduce the process of preparation of kuih peneram

The second set of questions were designed for informant business owners of the kuih peneram establishments. These questions were formulated in accordance with the third research objective which aimed to introduce the process of preparing kuih peneram to younger generations. Responses from the entrepreneurs offer valuable insights that can be linked to and support the research objective related to introducing the process of preparing kuih peneram among young generations. The research objective is to understand how the process of making traditional kuih, like kuih peneram, can influence heritage food knowledge among young generations.

Table:5: Introduce the process of preparation of kuih peneram

Interview questions	Selected responses
When is the right time to eat this kuih peneram?	<p><i>"For me, this kuih peneram is suitable to be eaten in the evening, while chatting it can be used as an afternoon tea snack" - Informant 1</i></p> <p><i>"Kuih peneram has often served as a celebration and wedding cake as a gift in the past. Now this kuih is often eaten at any time and usually in the evening, the best is to be eaten after frying" - Informant 5</i></p>
How long can kuih peneram last?	<p><i>"Usually, it can last for a month if there are no preservatives. The period can also last for a month to two months in an airtight container"- Informant 2</i></p> <p><i>"It can last up to a month depending on how it's stored"- Informant 5</i></p>
What causes the kuih peneram to not get the right texture during the process of preparation?	<p><i>"Incorrect frying temperature will cause the texture of the kuih to absorb oil. In addition, the temperature of the oil that is too hot or not hot will cause an incorrect texture" - Informant 2</i></p> <p><i>"In making this kuih peneram, you need the right skill in frying it because the temperature used must be right to prevent it from getting burn" - Informant 4</i></p>
Will the use of different ingredients have an effect on the taste of the kuih peneram?	<p><i>"Yes, it will give a different texture. This is because the main ingredients in making kuih peneram are just rice flour, brown sugar, and water. Different brands of flour will also cause different textures, so we use a tiga gajah brand to maintain the texture. If you use the Teratai brand it will cause the kuih to be soft and sticky" - Informant 2</i></p> <p><i>"Yes, I agree, because using other ingredients will cause the texture and taste of the kuih to be different, for example, palm sugar or brown sugar is used. Normally, palm sugar will be used in the making of our kuih peneram" - Informant 3</i></p>

Presented below analyse how the provided responses from the entrepreneurs can be connected to research objective three:

Versatility and enjoyment: All informants agreed that kuih peneram is a versatile treat, suitable to be enjoyed at any time and place. While it can be relished anytime, the consensus is that it makes a particularly delightful snack during teatime or in the evening. The informants' shared perspective underscores the widespread appeal of this Malaysian delicacy, whether as a traditional gift or a delightful indulgence for any occasion. In conclusion, this delicacy traditional kuih stands out as a treat that can be savoured at any time and any setting. Whether relished as a delightful snack during teatime, evening or even presented as a traditional gift.

Storage duration: The storage duration of kuih peneram according to the informants. Stored in an airtight container, this treat can remain fresh for one to two months, as unanimously agreed upon. However, some makers use preservatives, enabling the kuih to maintain its deliciousness for up to one year. This variety in storage practices showcases the versatility of kuih peneram, accommodating different preferences and ensuring its availability for extended periods. Overall, proper storage is crucial to preserve the quality of this cherished Malaysian delicacy, whether enjoyed freshly or with the aid of preservatives.

Temperature control during frying: Emphasises the significance of temperature control during the frying process of kuih peneram, according to the informants. Achieving the right temperature is crucial for obtaining the desired texture and preventing issues like burning or uneven cooking. Skilful frying techniques and patience are essential to ensure a crispy outer layer and proper oil absorption. Brown sugar also plays a key role, contributing to the taste and attractive colour of the kuih peneram. Overall, precise frying skills and attention to temperature details are vital in creating this traditional delicacy.

Ingredient selection for taste and texture: The significance of ingredient selection in shaping the taste and texture of kuih peneram, as noted by the informants. They concurred that using different ingredients can lead to distinct outcomes, with Tiga Gajah brand flour preferred for maintaining the desired texture. Additionally, the choice of sweetener, such as palm sugar or brown sugar, also influences the flavour. Consistency in ingredients is highlighted for achieving the preferred taste. However, some informants also recognised the importance of precise timing and temperature during the preparation process. Overall, ingredient choices play a vital role in crafting the perfect kuih peneram

6. Discussion

The first objective of this study is to assess the level of knowledge about kuih peneram among the young generations (RO1). Based on the study's findings, it was evident that the young participants had a good understanding of the ingredients used in preparing kuih peneram. Additionally, they commonly referred to this delightful treat as kuih telinga keling. Furthermore, some of them found its uniqueness intriguing, appreciating its various names and distinctive texture, crispy on the outside and soft on the inside. However, it came to light that the younger generations lacked awareness regarding the true historical background of kuih peneram. This knowledge gap resulted in their unfamiliarity with alternative names for this traditional delicacy. To address this issue, kuih peneram entrepreneurs should take the initiative to promote the name "kuih peneram" among the young people and share its rich heritage. By emphasising the significance of preserving and passing down the traditional name, we can ensure that kuih peneram continues to be celebrated by future generations. Creating awareness about its authentic identity and history will not only foster a deeper appreciation for this cherished delicacy but also safeguard its cultural legacy for years to come.

The second objective of this study is to delve into the level of knowledge among the young generations regarding the intricate production process of kuih peneram (RO2). Based on the insights provided by the informants, it became apparent that some of them were well acquainted with the art of preparing kuih peneram. They vividly described the process, emphasising the importance of boiling water and sugar while meticulously adding the dry ingredients to create the perfect dough. However, intriguingly, there was a slight disparity in their responses regarding the necessity of fermenting the dough before rolling. While some informants asserted that fermentation was not a prerequisite, others adamantly supported the idea of overnight fermentation to achieve optimal results.

Beyond the technical aspects, the informants conveyed the perceived difficulty in making this traditional delicacy. They acknowledged that while the process itself might not be overly complex, it requires a considerable level of skill and unwavering patience to achieve the delectable outcome that characterises kuih peneram. Furthermore, the young generations showcased their profound knowledge of the essential equipment employed in the preparation of kuih peneram, such as application moulds, pans, and indispensable rolling pins. Taking into

account the informants' comprehensive understanding of the intricate preparation process and their familiarity with the selection of commonplace ingredients, the researcher conclusively deduced that the young generations possess the necessary proficiency to create kuih peneram. This valuable insight not only reaffirms the continued accessibility of this traditional treat but also highlights the potential for its preservation and evolution through the enthusiasm and culinary expertise of the younger generations.

The third objective of this study (RO3) is dedicated to acquainting the younger generations with the intricacies of the kuih peneram preparation process. To fulfil this objective and address the research questions, in-depth interviews were conducted with a select group of kuih peneram entrepreneurs. These experienced individuals have devoted years to perfecting their craft, making them invaluable sources of knowledge. Throughout the interviews, these entrepreneurs emphasised that kuih peneram is best relished during the evening hours, making it a delightful afternoon tea snack. Moreover, they revealed that this traditional delicacy can be stored for an extended period, particularly when kept in an airtight container. The preservation tips offered by these experts provide essential insights into prolonging the shelf life of this beloved treat, ensuring it remains accessible to future generations.

The entrepreneurs' profound understanding of the frying process was evident during the researcher's observations. They stressed the significance of maintaining an optimal oil temperature to achieve the perfect texture and taste. Too high a temperature could lead to burnt kuih, while the right balance ensured crispy exteriors and soft interiors, just as kuih peneram should be. Another intriguing aspect brought to light by these entrepreneurs was the role of ingredient brands in shaping the final product. They emphasised the importance of meticulously selecting the right brands, as even seemingly minor variations could significantly impact the dough's texture and overall quality. This valuable knowledge underscores the fine balance between tradition and precision that goes into creating an exceptional batch of kuih peneram. Overall, the entrepreneurs' insights into the process of preparing kuih peneram provide a rich source of information that directly supports the research objective of introducing traditional food preparation processes to young generations. The knowledge shared by these entrepreneurs not only guides the technical aspects of kuih preparation but also conveys the cultural significance and heritage preservation.

7. Recommendation

Several recommendations can be proposed to deepen the introduction of this traditional kuih peneram to the younger generations. To deepen the introduction of this traditional kuih peneram to the younger generations, organisers of university events should collaborate with small kuih peneram traders, providing them opportunities to showcase their craft and demonstrate the kuih-making process, thereby fostering an appreciation for the traditional delicacy among students.

Embracing the power of social media promotion, kuih peneram entrepreneurs should utilise platforms like Instagram and YouTube to showcase the art of making this delicacy, using engaging visuals and captivating storytelling to pique the interest and curiosity of the younger generations. In response to the growing popularity of the nickname 'kuih telinga keling,' efforts should be made to enlighten the community about the history and heritage of kuih peneram, while respectfully correcting its name to kuih peneram to ensure it becomes the widely accepted and cherished name among all.

To preserve the authenticity of kuih peneram, entrepreneurs should adhere strictly to the original recipe, utilising fundamental ingredients like rice flour, wheat flour, brown sugar, and water, while avoiding trendy additions such as cheese, condensed milk, or excessive toppings, thus upholding the essence of this time-honoured treat. By implementing these carefully crafted recommendations, the younger generations can forge a deeper connection with the cultural significance of kuih peneram. Maintaining the traditional preparation methods and promoting it in a respectful and engaging manner will ensure that this beloved delicacy continues to be cherished and preserved for generations to come.

8. Conclusion

In conclusion, this comprehensive study sheds light on the dwindling appreciation for traditional kuih among the younger generations, emphasizing the importance of preserving cultural culinary heritage. Through meticulous research and interviews with diverse informants of different ages, This study has gained valuable insights into the knowledge and perceptions surrounding kuih peneram. The findings indicate that while some young individuals are familiar with kuih peneram, there is a need to raise awareness and revive interest in this traditional delight. Social changes and modern influences have impacted the popularity of traditional kuih, making it crucial for kuih peneram entrepreneurs to take proactive measures to safeguard their authentic recipes and techniques.

The study has revealed that the younger generations can learn and inherit the art of making kuih peneram from their own family members, ensuring the continuation of this culinary legacy. Furthermore, the expertise shared by experienced kuih peneram entrepreneurs provides valuable insights into the intricate preparation process, highlighting the cultural significance of this beloved Malaysian delicacy. To ensure the preservation of this rich culinary heritage, it is essential to disseminate this knowledge among the younger generations through various platforms, including social media. By introducing kuih peneram to the wider audience and correcting any misconceptions, we can foster a deeper appreciation for this cherished traditional treat. By actively promoting and celebrating the beauty of kuih peneram, we pave the way for its sustained relevance and cultural significance for generations to come. Through our collective efforts, we can keep the spirit of traditional kuih alive, allowing it to flourish and delight the taste buds of future generations, while maintaining its rightful place in Malaysia's culinary heritage.

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Appendix



Figure 1: Freshly fried kuih peneram

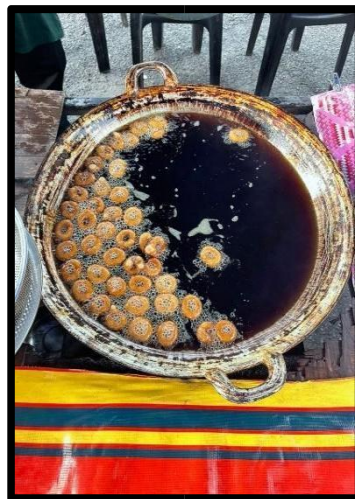


Figure 2: The process of frying kuih peneram



Figure 3: Kuih peneram entrepreneur is rolling the dough



Figure 4: Workstation of making kuih peneram



Figure 5: Researcher with one of the kuih peneram entrepreneurs

Issues and Perspectives in Business and Social Sciences

Exploring the nexus of entrepreneurial potential and entrepreneurial mentoring among TVET programme students

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Abstract

Malaysia government aims to foster an entrepreneurial ecosystem by launching The National Entrepreneurship Policy in 2019 to encourage TVET students to participate in entrepreneurship. TVET students are taught about business startups. This collaboration with the Ministry of Education (MoE) seeks to nurture student entrepreneurs as job creators. Issues such as salary discrimination, and competency gaps are often faced by TVET graduates. A total of 252 students from Vocational Colleges in Malaysia were selected using stratified sampling. The result found entrepreneurial students and entrepreneurial interaction have a relationship with entrepreneurial potential. Yet, no relationship was indicated between entrepreneurial potential and the entrepreneurial mentor. The study expands knowledge of TVET students' entrepreneurial potential and provides insights into entrepreneurial potential studies for Malaysian entrepreneurship academia. It also helps the public and private sectors create entrepreneurship mentoring programmes. The findings support the TVET institution's goal of becoming an entrepreneurial hub.

Keywords:

entrepreneurial potential, TVET, mentoring, entrepreneurial interaction, SEM-PLS

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1. Introduction

Entrepreneurship education is emerging as a key approach to encourage entrepreneurship, specifically cultivating entrepreneurial aspirations and new business ventures (Munawar et al., 2023). Nevertheless, the journey of entrepreneurship does not end with the acquisition of theoretical knowledge and the initiation of a business venture. Entrepreneurship education and entrepreneurial support are equally crucial in ensuring the long-term success and sustainability of entrepreneurial ventures (Nchu et al., 2023; Shehu & Ahmad, 2023). Entrepreneurial education is an initial or startup learning that includes various activities and resources that help students learn more about entrepreneurship (Jáki & Huszák, 2023). Lei et al. (2023) explain that entrepreneurial support may include workshops, seminars, mentoring programmes, networking opportunities, and access to business resources and expertise. When students engage in entrepreneurship education and get support from entrepreneurial mentors, students can acquire new skills in entrepreneurship education (Prastyaningtyas et. al, 2023). Moreover, entrepreneurial mentoring mechanisms are vital in providing students with the necessary guidance, encouragement, and connections to grow in their entrepreneurship education (Zhang, 2023; Passavanti et al., 2023). Mentors, or coaches, can offer valuable insights, feedback, and advice, and assist students in looking for and seizing business opportunities (Dilshodovich, 2023).

Fauchald et al. (2022) agree that entrepreneurial mentoring enables students to connect with mentors, share entrepreneurship experiences, and learn from one another.

In general, the percentage of individuals engaged in entrepreneurial activities in Malaysia currently at 4.74% of the overall population, reflects the existing entrepreneurial landscape in the country (Soebijantoro et al., 2021). While Malaysia has made progress in cultivating entrepreneurship, it falls behind some neighbouring countries such as Singapore, Indonesia, and Thailand in terms of entrepreneurial activity rates. Hutasuhut and Aditia (2021) added, Singapore shows a higher rate of 8.76%, indicating a more robust entrepreneurial ecosystem and a greater proportion of individuals involved in entrepreneurial endeavours. Leong (2008) explained the lower entrepreneurial activity rate in Malaysia suggests the need for concerted efforts to encourage and support aspiring entrepreneurs, particularly among the student population. Recognising the potential for entrepreneurship among students is crucial for fostering a vibrant and dynamic entrepreneurial ecosystem (Kantis et al., 2020). By nurturing the entrepreneurial aspirations of students, Malaysia can tap into a valuable pool of innovative and creative minds, driving economic growth and job creation (Agrawal et al., 2023).

Putro et al. (2022) identified that entrepreneurship education is one of the critical factors in increasing entrepreneurial potential. Nowiński et al. (2019) conducted a study that reinforced the positive impact of entrepreneurship education on students' entrepreneurial potential. The findings highlight that entrepreneurship education acts as a catalyst in shaping students' entrepreneurial potential. It helps foster entrepreneurial characteristics, such as creativity, innovation, risk-taking propensity, self-confidence, and resilience. These qualities are vital for individuals aspiring to embark on entrepreneurial ventures and navigate the challenges inherent in the business landscape. Pham (2018) agreed that entrepreneurship education could encourage entrepreneurial activities. Alharbi et al. (2018) concurred that entrepreneurship education has been shown to predict student business formation.

Today's entrepreneurship education is important because it equips students with the confidence and skills necessary to operate a business. This is agreed by the study conducted by Anwar et al. (2022) and Okagbue et al. (2023) indeed supported that entrepreneurship education significantly increases entrepreneurial potential. After implementing entrepreneurship education within the Technical Vocational Education and Training program (TVET), the Ministry of Education Malaysia (MoE) has taken steps to equip TVET lecturers with entrepreneurial skills. It involves providing them with training through several entrepreneurship courses (James et al., 2023; Abdullah et al., 2019). Additionally, an entrepreneurship-certified lecturer has been designated to provide students from different programmes with exposure to the concepts of entrepreneurship. Entrepreneurial mentoring is essential for aspiring students to develop entrepreneurial skills (Wilbanks, 2013). However, students often face obstacles such as a lack of mentorship (Hägg et al., 2023), funding (Singh Sandhu et al., 2011), experience (Ozen et al., 2023), difficulty in balancing schoolwork and running a business (Hartikainen et al., 2023), and insufficient networking opportunities with other businesspeople (Blažič, 2022). TVET lecturers, who are essentially upgraded lecturers from non-skilled education backgrounds, may find entrepreneurial mentoring challenging and time-consuming, potentially distracting them from their teaching and research responsibilities (Stephen & Festus, 2022). This can be particularly burdensome if they are already overwhelmed with administrative duties (Shi & Bangpan, 2022). Moreover, a lack of experience in mentoring entrepreneurs could also pose a challenge for lecturers (Davis et al., 2022). However, Lope Pihie and Bagheri (2011) mentioned that entrepreneurship lecturers or teachers should be entrepreneurial.

Hossain et al. (2023) emphasised that entrepreneurial mentoring can significantly impact the development of entrepreneurial potential among students. Mentors can offer students guidance, advice, and support in developing their entrepreneurial skills, knowledge, and attitudes (Daragmeh & Halabi, 2023). This paper argues that lecturers with entrepreneurial backgrounds are responsible for teaching entrepreneurship education to encourage entrepreneurial potential

among TVET students. This study empirically explores such elements in entrepreneurial mentoring in developing students' entrepreneurial potential exhibited by TVET students when it comes to initiating their own businesses.

2. Literature review

This section focuses on reviewing the literature related to entrepreneurial potential and the antecedents of entrepreneurial mentoring, including the roles of entrepreneurial mentors, entrepreneurial students, and entrepreneurial interactions. The goal is to develop research hypotheses and frameworks.

2.1 Entrepreneurial potential

Rofa and Ngah (2022) distinguish three important entrepreneurship concepts: entrepreneurial potential, entrepreneurial intention, and entrepreneurial readiness. Entrepreneurial potential refers to a person's propensity for entrepreneurship and correlates with creativity, risk-taking, and self-efficacy (Ćočkalo et al., 2017). In contrast, entrepreneurial intention is the desire to start a business and is influenced by cognitive factors such as attitudes, subjective norms, and perceived behavioural control (Maheshwari et al., 2022).

Moreover, entrepreneurship readiness focuses on a person's preparedness and willingness to navigate the entrepreneurial landscape, including risk management, quick decision-making, and adaptability. Despite being a relatively new concept in entrepreneurship research, behavioural control emphasises the significance of an individual's ability to effectively respond to the challenges and demands of entrepreneurship (Olugbola, 2017; Coduras et al., 2016). By comprehending these three concepts, as highlighted by Rofa and Ngah (2022), researchers and practitioners can develop interventions and programmes to support and promote entrepreneurship. The clarity in these areas facilitates the advancement of knowledge and the growth of the field of entrepreneurship.

When embarking on a business venture, young individuals and college graduates are more prone to exhibit higher entrepreneurial potential compared to non-graduates with lower potential for entrepreneurship (Makwara et al., 2023). This finding suggests that entrepreneurial education and age are important factors in developing entrepreneurial potential. Aside from that, exposure to a wide range of experiences, a willingness to take risks, and creative prowess are just a few of the qualities and experiences that young people and recent college graduates possess that make them ideal candidates for entrepreneurial endeavours (Sarwar et al., 2023). Since entrepreneurial education is identified as one of the most critical factors in developing entrepreneurial potential, Tiberius et al. (2023) have listed courses such as marketing, accounting, and finance, which are important among others. By equipping these students, they may obtain entrepreneurial skills, which can be essential for starting and running a business in the future.

2.2 Entrepreneurial mentoring

Khelifi (2023) highlights the importance of mentoring in influencing students' entrepreneurial potential. Mentoring programmes can provide students with practical knowledge, guidance, and support essential for entrepreneurship. This support can be in advice, access to networks, and financial resources. Entrepreneurial mentoring provides students with guidance, advice, and support from experienced entrepreneurs or professionals (Zhang & Nong, 2023). Mentors can share their knowledge, experiences, and best practices, which can help students to refine their ideas and develop their entrepreneurial skills further. By combining entrepreneurship education

and mentoring, students can develop comprehensive understanding of entrepreneurship, which can help them visualise and create their businesses (Zen et al., 2023; Zeng et al., 2023).

Bist (2023) adds that students representing the next generation of entrepreneurs play a vital role in job creation and economic development. Consequently, Higher Education Institutions (HEIs) could shape future employers by offering entrepreneurship education and mentoring programmes (Kintu et al., 2019). Government initiatives and policymaker actions also play a crucial role in fostering the entrepreneurial potential of young individuals, as they contribute to inspiring and motivating young people to pursue entrepreneurship (Poon et al., 2023).

Entrepreneurial mentoring is recognised worldwide as an effective method to train and motivate new business owners (Annas & Melinda, 2023). It involves providing aspiring entrepreneurs with guidance and support from experienced professionals (Nate et al., 2022). Madu and Okunna (2023) confirm that mentorship facilitates practical knowledge acquisition and entrepreneurial skill development, leading to successful ventures. Thus, this study explores students' entrepreneurial potential by considering the demonstration of the effectiveness of mentoring. Ting et al. (2017) classified entrepreneurial mentoring as consisting of mentors, students, and interaction.

2.3 Entrepreneurial mentor

Mentors can play various roles, including leaders, models, coaches, teachers, advisors, counsellors, and even "buddies," to assist their mentees (Kent et al., 2003). Entrepreneurial mentors help students evaluate business opportunities, develop business plans, and manage business risks (Prastyaningtyas et al., 2023; Bist, 2023). An entrepreneurial mentor, in the context of this study, refers to a TVET lecturer accredited and certified to help students develop entrepreneurial skills and mindset (Njenga, 2023). According to Musyimi and Mwasiaji (2023), TVET students require mentors with entrepreneurial experience. As a result, an entrepreneurial mentor assists students in developing entrepreneurial skills (Susanto, 2023). Students can be inspired and motivated to pursue their entrepreneurial goals by a passionate, dedicated, and genuinely invested entrepreneurial mentor (Shymko & Khoury, 2023). As a result, young entrepreneurs require qualified, committed mentors to share their knowledge and experience (Prastyaningtyas et al., 2023).

H1: Entrepreneurial mentor has a positive relationship with entrepreneurial potential.

2.4 Entrepreneurial students

Entrepreneurial students have unique traits that set them apart from others, such as motivation, innovation, and a strong desire to build successful businesses. According to Bejinaru et al. (2023), an entrepreneurial student has an entrepreneurial mindset and actively engages in entrepreneurial activities while pursuing their education. These students strongly desire to create and innovate and frequently look for opportunities to apply their skills and knowledge in a business setting (Adeel et al., 2023).

Within a TVET programme, students' entrepreneurial learning can be fostered as they follow their mentors' instructions (Khieng et al., 2019). Their young age, which ranges from 15 to 19 years old, allows mentors to easily instil discipline and positive entrepreneurial habits (Hastuti & Maslamah, 2023). Student's willingness to follow instructions and acknowledge feedback aids learning and entrepreneurship (Bazkiaei et al., 2020). However, student's willingness is subjective and may not apply universally (Shah et al., 2020). Each student has a unique personality and circumstances (Singh & Mehdi, 2022).

Sunny and Ismail (2023) explained that TVET programmes emphasise practical skills to improve career prospects and employability. TVET programmes are accessible and tailored to diverse

students who may have struggled in traditional academic settings (Song & Chea, 2023). Entrepreneurial subjects like business planning, market research, financial management, and marketing skills help students identify and pursue entrepreneurial opportunities (Djubaedi et al., 2023). Indeed, entrepreneurship education in TVET programmes gives students the skills to succeed in the entrepreneurial world, regardless of their entrepreneurial potential (Padi et al., 2022).

H2: Entrepreneurial student has a positive relationship with entrepreneurial potential.

2.5 Entrepreneurial interaction

Jackson (2022) elaborates that by interacting with a mentor, an entrepreneurial student can learn about different aspects of entrepreneurship and receive guidance on overcoming common obstacles. Lowell and Yang (2023) explained that the interactions can provide feedback that help students grow their businesses and confidence. Assenova (2020) studied that mentors provided the knowledge, skills, and resources required to develop entrepreneurial potential, making the conversation between mentor and student highly impactful. The mentor's guidance and support stimulate success, providing the necessary direction, support, and networking opportunities to launch and grow a business (Bozward et al., 2023).

H3: Entrepreneurial interaction has a positive relationship with entrepreneurial potential.

Figure 1 depicts the study's framework. The independent variables are entrepreneurial mentors, entrepreneurial students, and entrepreneurial interaction. The dependent variable is entrepreneurial potential.

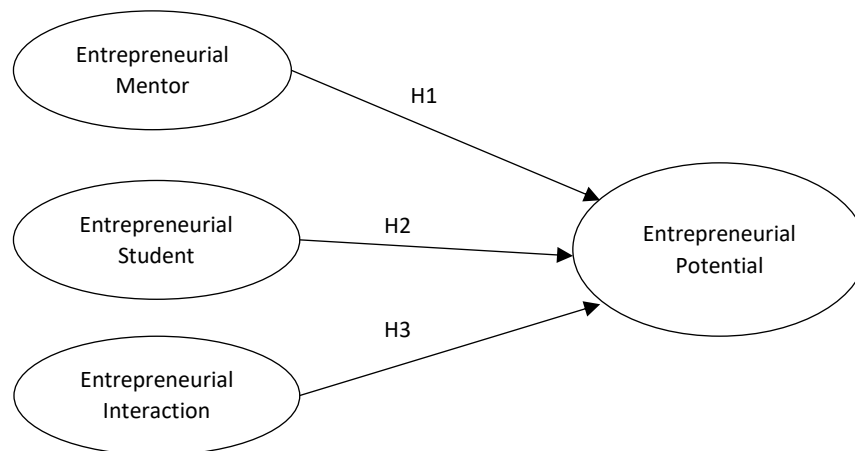


Figure 1: The framework of study

3. Methodology

The population of TVET students was 61,870 as of 2019 (Ministry of Education Malaysia, 2019) covering vocational colleges in the states of Malaysia, Sabah, and Sarawak. Stratified sampling was employed, and the data collection was carried out through online. A total of 382 students were selected as the maximum target, ensuring accuracy and representation for the entire population (Krejcie & Morgan, 1970; Huang & Zhang, 2023). The survey was distributed to final-year students who had taken entrepreneurship education at vocational colleges. The survey link was emailed to the principal of each vocational college and shared via WhatsApp with entrepreneurship lecturers and their groups of students. A total of 500 online questionnaires

were distributed and 252 questionnaires were completed and usable, indicating 50.4 percent of response rate. Nulty (2008) explained the response rate was consistent with the response rate in education for online surveys which ranged from 20 to 50 percent. The survey obtained responses from a diverse range of vocational colleges across the country. Ting et al. (2017) deployed and modified measurement instruments to evaluate entrepreneurial mentoring, and Colakoglu and Gozukara (2016) used and modified measurement instruments to assess entrepreneurial potential. Table 1 displays specific item measurements which consist of entrepreneurial mentor, entrepreneurial student, and entrepreneurial interaction. For clarity, the survey used a five-point Likert scale, and Partial Least Squares Structural Equation Modelling (SEM) for data analysis. It is because of its dependability and ability to run multiple analyses concurrently. The SEM framework contained two models: the measurement model for testing the outer model and the structural model for validating the inner model. This method produced consistent results for the study.

Table 1: Item Measurements

Variables	Measurements
Entrepreneurial Mentor (M)	<ul style="list-style-type: none"> • The lecturer/mentor is enthusiastic and open-minded. • The moral quality of the lecturer/mentor is excellent. • The lecturer/mentor is willing to listen.
Entrepreneurial Student (P)	<ul style="list-style-type: none"> • I am a very outgoing person. • I have the initiative to learn. • I have a solid knowledge of basic entrepreneurial skills.
Entrepreneurial Interaction (Int)	<ul style="list-style-type: none"> • The communication mode between my lecturer/mentor and myself is appropriate. • The communication content between my lecturer/mentor and myself is useful. • My lecturer/mentor and I can get along well. • My lecturer/mentor and I trust each other. • My lecturer/mentor and I have a similarity of preferences.
Entrepreneurial Potential (EntP)	<ul style="list-style-type: none"> • I am ready to do anything to be an entrepreneur. • My goal is to be a professional entrepreneur. • I am determined to create a business venture in the future. • I do not have doubts about starting my own business in the future. • I have a strong intention to start a business in the future. • My academic qualification will contribute to my interest in starting a business.

4. Results and finding

The finding presented responses from male students about 46.4% and female students about 53.5%. The responses from TVET programmes of social community service is 48.4%, agriculture is 40%, and business is 37.5%. While technology and communication programme shows the smallest figure at 9.12%. The hospitality programme accounts for 4.76%. Response profile information is displayed in Table 2.

Table 2: Profile Information

Demographic	Item	Frequency	Percentage
Gender	Male	117	46.4
	Female	135	53.5
TVET Programme	Business	95	37.6
	Agriculture	10	4.0
	Engineering	101	4.36
	IT & Communication	11	9.12
	Tourism & Hospitality	23	4.76
	Social Community Service	12	48.4

4.1 The measurement model

Convergent validity, internal reliability, and discriminant analysis can be used to evaluate a measurement model. According to Chin (2009), these techniques can be used to evaluate the measurement model, which considers the loadings, reliability, and validity of the measures employed to represent each construct. Hair et al. (2017) recommend that the loadings should exceed 0.7. Kline's (2011) suggestions show that the average extracted variance and composite reliability of the variables were both above the 0.5 and 0.7 thresholds. Convergent validity is shown by the fact that the measures of the variables/constructs are good enough. In Table 3, the variables and constructs for convergent validity are shown. Thus, the condition of convergent validity has been met. Convergent validity and discriminant analysis had been performed and all items are found valid for further testing.

Table 3: Convergent Validity Analysis

Variable	Construct	Loadings	CR	AVE
Entrepreneurial Mentor	M1	0.917	0.929	0.814
	M2	0.882		
	M3	0.909		
Entrepreneurial Student	S1	0.803	0.866	0.683
	S2	0.822		
	S3	0.854		
Entrepreneurial Interaction	Int1	0.848	0.911	0.672
	Int2	0.783		
	Int3	0.866		
	Int4	0.848		
	Int5	0.749		
Entrepreneurial Potential	EP 1	0.831	0.948	0.751
	EP 2	0.889		
	EP 3	0.887		
	EP 4	0.869		
	EP 5	0.896		
	EP 6	0.825		

Note: CR: Composite Reliability, AVE: Average Variance Extracted.

4.2 The structural model

The evaluation of the measurement model is satisfactory. Standard evaluation criteria include the coefficient of determination (R^2), the blindfolding-based cross-validated redundancy measure Q^2 , and the statistical significance and relevance of the path coefficients. Before assessing the structural relationships, Hair et al. (2017) suggested that collinearity must be examined to avoid bias in the regression results. Regarding the prevalent method bias of PLS-SEM, Kock (2015) proposes a comprehensive collinearity assessment strategy. According to Hair et al. (2017) and Kock (2015), the ideal VIF values are between 2 and 3. The evaluation revealed that most VIF values are close to 3 or lower. Some items are more significant than 3 but less than 5, and VIF values above 5 suggest potential collinearity issues among the predictor constructs. Since collinearity is not a concern, the following step is to examine the R^2 value. The entrepreneurial mentoring elements contributed 48.6 percent variance explaining entrepreneurial potential. Henseler et al. and Hair et al. (2011), state that R^2 values of 0.75, 0.50, and 0.25 are considered substantial, moderate, and weak, respectively. Hence, the R^2 value in this study can be categorised as moderate. This indicates that the model effectively fits the data, as supported by Hair et al. (2019). For Q^2 values greater than 0, 0.25, and 0.50 indicate the PLS-path model's small, medium, and large predictive significance (Hair et al., 2019). In this study, the coefficient of determination ($R^2 = 0.486$) is regarded as highly predictive. According to the PLS-path model, the predictive significance of blindfolding entrepreneurial potential ($Q^2 = 0.341$) is between medium and high. Figure 2 depicts the study's structural model. Based on SRMR (Square Root Mean Residual)

values of 0.067, this model demonstrated a good model fit. It falls short of the standard value of 0.08 (Garson, 2012; Hair, 2010; Schumacker & Lomax, 2004).

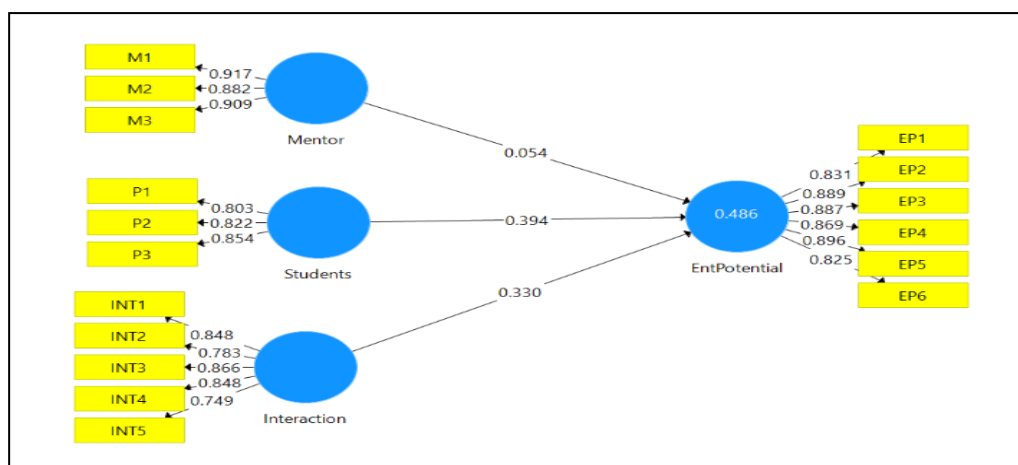


Figure 2: The structural model

Henseler et al. (2015) suggested that the heterotrait-monotrait (HTMT) ratio of correlations was used to test the discriminant analysis. HTMT is deemed superior and capable of achieving higher specificity and sensitivity rates. Ringle, and Sarstedt, (2015) highlight the HTMT values fall below the 0.90 threshold. The discriminant analysis had thus been completed and established between two reflective constructs. The discriminant analysis of the HTMT criterion is shown in Table 4.

Table 4: HTMT Criterion

	Entrepreneurial Potential	Entrepreneurial Interaction	Entrepreneurial Mentor	Entrepreneurial Student
Entrepreneurial Potential	-	-	-	-
Entrepreneurial Interaction	0.698	-	-	-
Entrepreneurial Mentor	0.479	0.802	-	-
Entrepreneurial Student	0.736	0.832	0.472	-

According to Table 5, the entrepreneurial mentor has no effect on entrepreneurial potential ($\beta = 0.054$, $t = 0.602$). As a result, H1 is not supported. Meanwhile, entrepreneurial student and entrepreneurial interaction have a significant relationship to entrepreneurial potential ($\beta = 0.623$, $t = 5.317$), and entrepreneurial interaction has a significant relationship to entrepreneurial potential ($\beta = 0.330$, $t = 3.382$), supporting both H2 and H3. Table 5 depicts a detailed path analysis of the hypotheses' direct relationship.

Table 5: The Structural Equation Modelling Result for Hypotheses

Variable	Standard Coefficient (β)	t-statistic	p-value	Conclusion
H1 : Entrepreneurial mentor has a positive relationship with entrepreneurial potential	0.054	0.602	0.547	Not Supported
H2 : Entrepreneurial student has a positive relationship with entrepreneurial potential	0.394	5.317	0.000	Supported
H3 : Entrepreneurial interaction has a positive relationship with entrepreneurial potential	0.330	3.382	0.001	Supported

5. Discussion

Entrepreneurial mentoring is an effective tool for assisting students in developing their entrepreneurial potential, with about 48.6 percent of the variability in their potential. However, various factors can impact the effectiveness of mentoring programmes. This study found that entrepreneurial mentors have an insignificant relationship with entrepreneurial potential. In fact, entrepreneurial mentors are crucial in guiding and supporting aspiring entrepreneurs on their journey toward success. Studies by Zhang (2023) displayed some mentors may focus heavily on theoretical concepts, which may not provide students with sufficient practical experience. This imbalance can hinder students' abilities to apply their knowledge effectively in real-world entrepreneurial settings. Moreover, mentors with insufficient experience (Davis et al., 2022), knowledge (Okeremi & Caesar, 2022), and lack of mentorship (Olumuyiwa et al., 2023) may not effectively guide and support students, leading to programme failure.

Then, entrepreneurial student is found to have a significant relationship with entrepreneurial potential. Since entrepreneurial education has been incorporated in TVET programmes, this integration has the potential to breed more student entrepreneurs (Hanafi et al., 2023; Rofa and Ngah, 2022). This approach not only equips students with entrepreneurial skills (Kalogiannidis et al., 2022), but also instils the creativity and innovation required for entrepreneurship (Agbonna, 2022). Moreover, this merger serves as valuable preparation for students as they transition into the workforce. Several TVET institutions have taken proactive steps by encouraging their students to engage in entrepreneurship clubs actively (Pittaway et al., 2023). As a result, this participation has emerged as a significant factor contributing to the presence of entrepreneurial students within the TVET system.

The final findings found entrepreneurial support had a significant relationship with entrepreneurial potential. Many students have ventured into entrepreneurship without adequate support from mentors (Prastyaningtyas et al., 2023). However, Zhang (2023) explained in the process of entrepreneurship in learning institution, lecturers or mentors who act as entrepreneurial mentors can provide positive emotional support to create a supportive environment for student entrepreneurs to maintain and improve their level of self-efficacy, self-confidence, and efficiency of opportunity recognition in a risky environment. Hejazi and Sadoughi (2023) added that emotional support given by lecturers or mentors could make the entrepreneurial education learning process successful among students.

A comprehensive entrepreneurial education requires a balance between theoretical knowledge and practical application (Bell, & Cui, 2023). Entrepreneurial mentors must provide guidance that includes practical experiences (Laalo et al., 2020) and real-world challenges (Gimmons, 2014). Ewim (2023) elaborates that collaborative learning environments between entrepreneurial mentoring and entrepreneurial students can further enhance students' entrepreneurial mindset and equip them with the necessary skills and experiences to navigate the entrepreneurial landscape successfully. By combining theoretical knowledge, practical experience (Avazovna, 2022), and effective mentoring (Yuan et al., 2022), students can develop a well-rounded entrepreneurial foundation and increase their likelihood of success.

6. Conclusion

Future research should investigate the entrepreneurial mentorship approach in depth, considering additional relevant dimensions and factors. Researchers must conduct comprehensive studies that closely observe and analyse entrepreneurial mentoring activities to gain deeper insights into their effectiveness and impact on students' entrepreneurial development.

To facilitate effective mentorship in TVET institutions, MoE has prepared guidelines that can serve as a blueprint for developing mentorship programmes. These programmes should focus on matching TVET students with successful entrepreneurs who can guide and inspire them. Clear timelines, well-defined mentor and mentee expectations, and a regular monitoring system should be established to ensure the effectiveness of mentorship relationships.

Furthermore, mentors should be provided with appropriate training to effectively work with students, share their expertise, and nurture their mentees' entrepreneurial potential. This training can equip mentors with the necessary skills to guide students in various aspects of entrepreneurship, such as business planning, market analysis, financial management, and networking.

Students can benefit greatly from engaging with successful entrepreneurs, investors, and other business stakeholders within the TVET institutions' environment. These interactions can provide valuable insights and networking opportunities, helping students learn about real-world entrepreneurship and gain practical knowledge and guidance.

Moreover, TVET institutions can incorporate practical experiences into the curriculum, such as entrepreneurship internships, cooperative programmes, and business plan competitions. These initiatives allow students to apply their theoretical knowledge, gain hands-on experience, and refine entrepreneurial skills. Creating an entrepreneurial culture within TVET institutions is essential to inspire and motivate future entrepreneurs. It can be achieved through promoting entrepreneurship as a viable career option, providing support and resources for aspiring entrepreneurs, and celebrating the achievements of student entrepreneurs.

In conclusion, future research should explore the details of entrepreneurial mentoring, considering additional dimensions. TVET institutions can utilise the MoE guidelines to develop effective mentorship programmes, foster connections between students and industry experts, and provide practical experiences and resources to cultivate an entrepreneurial mindset and entrepreneurial personality traits. By implementing these measures, TVET institutions can play a role in shaping and nurturing the entrepreneurial potential among TVET students.

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