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Fakulti Pengurusan dan Perniagaan

FBM-SEREMBAN INTERNATIONAL INNOVATION COMPETITION (FBM-SIIC)

INVENTOPIA 2023

EXTENDED ABSTRACT BOOK

"IDEAS UNLEASHED: THE ULTIMATE INNOVATION CHALLENGE"

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3 NOVEMBER 2023, MALAYSIA

Faculty of Business and Management,
Universiti Teknologi MARA Cawangan Negeri Sembilan,
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PREFACE

Greetings and a warm welcome to the Extended Abstract Book of INVENTOPIA 2023: FBM-Seremban International Innovation Competition (FBM-SIIC). This book is proof of the remarkable spirit of innovation and dedication that transformed INVENTOPIA 2023 into a resounding success.

INVENTOPIA isn't just a contest; it's a melting pot of creativity, intelligence, and ingenuity. Here, bright ideas come to life, and the pursuit of solutions to real-world challenges defines innovation at its core. Within these pages, you will find welcoming words from the key figures who shaped INVENTOPIA 2023.

As you flip through the pages, you'll encounter the unsung heroes who toiled behind the scenes, ensuring the seamless and equitable flow of this competition. Our dedicated committee members and discerning jurors have invested their time and expertise, and their names are proudly displayed.

The list of accomplished winners is a tribute to their innovative ideas. Moreover, the abstracts encapsulate the essence of each participant's ingenious concept, offering a wellspring of inspiration to fellow inventors and dreamers.

We trust that this Programme and Abstract Book will not only provide you with insights into the event but also ignite your own journey of innovation and discovery. Your presence and support have played an instrumental role in making INVENTOPIA 2023 a reality. Thank you.

Warm regards,
Editor

MESSAGE FROM THE RECTOR

PROFESSOR DR. YAMIN YASIN
UNIVERSITI TEKNOLOGI MARA CAWANGAN NEGERI SEMBILAN, MALAYSIA

Assalamualaikum WBT and Good Day,

It gives me great pleasure to be here today on this online platform to welcome you most cordially for the official opening of the Faculty of Business and Management, UiTM Seremban International Innovation Competition 2023 (FBM-SIIC). This competition is organized by the Faculty of Business and Management, Universiti Teknologi MARA, Cawangan Negeri Sembilan, Seremban Campus. This is the first IID event for FBM Seremban Campus with the theme "IDEAS UNLEASHED: THE ULTIMATE INNOVATION CHALLENGE", congratulations.

With my deepest gratitude, I thank you for all the support given to the competition. With 65 participants (local and international) from TWO categories of Science, Technology, Engineering & Mathematics; AND; Social Sciences & Humanities, the competition is highly relevant as it offers an excellent platform for a wealth of knowledge and expertise to be exchanged by fellow educators, academics, researchers and also students.

Innovation extends beyond mere brainstorming and problem-solving; it requires the kind of intelligence that can harness creativity fuelled by inspiration. I believe innovation represents the transformation of an idea into tangible, real-world solutions. This post pandemic era is an opportunity and a time for us to focus on how we can better ourselves and continue to contribute to the development of our country and future by creating new and innovative ideas. In the aftermath of the pandemic, the catalyst for converting global challenges into avenues for progress and solutions that can benefit society lies in the unparalleled magnitude of technological advancements that have transformed economic and societal advancements on a global scale. Therefore, I believe that this competition is one of the best innovative sharing platforms for everyone to take collective responsibility, particularly the educational consortium, to create, innovate and transform ideas into solutions through a product that can go towards and beyond commercial gain. This is to ensure that, as we move on our path to the future, we will remain relevant and competitive.

"Empowering innovation creates opportunities and goals".

Finally, I would like to take this opportunity to congratulate the Faculty of Business and Management, UiTM Seremban Campus on their great effort in organizing this esteemed event. Well done!

Thank you.

MESSAGE FROM THE COORDINATOR

YM TENGKU SHARIFILEANI RATUL MAKNU TENGKU SULAIMAN SHARIFADDIN
FACULTY OF BUSINESS AND MANAGEMENT,
UiTM CAWANGAN NEGERI SEMBILAN, SEREMBAN CAMPUS

Assalamualaikum WBT and Good Day,

It is my great pleasure to welcome all of you to ***the INTERNATIONAL INNOVATION COMPETITION (FBM-SIIC) – INVENTOPIA 2023***.

This INTERNATIONAL INNOVATION COMPETITION with the theme, **"IDEAS UNLEASHED: THE ULTIMATE INNOVATION CHALLENGE"**, aiming to bring together leading academics, researchers, research scholars and students to participate and share the invention and creative innovation of ideas and products.

I would like to thank our top management of UiTM Cawangan Negeri Sembilan and my fellow faculty members for their overwhelming support in making this event a successful one. This INVENTOPIA competition is conducted on a digital platform in line with the digital era in the academic world as we evolved through the post-pandemic situation. I would like to thank the Program Chairperson for the brilliant suggestion on organizing this INVENTOPIA competition, the committee members, the juries and all the people involved. I would also like to thanks all the participants who have submitted their creative innovations to this competition.

Lastly, I would like to extend our gratitude to the Rector of UiTM Cawangan Negeri Sembilan for his continued support towards the Faculty of Business and Management, UiTM Cawangan Negeri Sembilan, Seremban Campus, International Innovation Competition (FBM-SIIC 2023).
"Innovation and creativity leads to entrepreneurship".

Thank You.

MESSAGE FROM THE CHAIRMAN

NURFADHLINA ZAINAL ABEDIN
FACULTY OF BUSINESS AND MANAGEMENT,
UiTM CAWANGAN NEGERI SEMBILAN, SEREMBAN CAMPUS

Assalamualaikum WBT and Good Day

I am honoured and delighted to welcome you to the ***INTERNATIONAL INNOVATION COMPETITION (FBM-SIIC) – INVENTOPIA 2023*** of Faculty of Business and Management, UiTM Cawangan Negeri Sembilan, Seremban Campus. This is our first IID event with the theme; **"IDEAS UNLEASHED: THE ULTIMATE INNOVATION CHALLENGE"**. As the committee chairman, I will not be able to organize this competition, if not because of the amazing members in the organizing committee who have work together with me to make this competition a successful and meaningful one.

Bringing this competition into reality requires the hard work, support, and dedication of many parties. We wish to thank all the committee members who together make the competition possible. The committee has been working hard in a limited time to organize, promote, review entries, answer queries, and respond to requests for submission.

Last but not least, we thank all the participants and juries who are the backbone of this competition. We value your support and kind help for this competition. I sincerely hope that this competition will give a meaningful experience and valuable knowledge and information to all the participants in empowering innovation.

Thank you.

PRODUCTION OF SANITARY PADS FROM BANANA STEM FIBRES

Nur Syazana binti Abdul Halem, Maizatul Azween binti Mohd Arbain, Nor Ifa Syamira binti Noryazid, and Atiyyah binti Haji Musa*

Department of Textile and Clothing Technology, Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM) Cawangan Negeri Sembilan, Kampus Kuala Pilah, 72000 Kuala Pilah, Negeri Sembilan, Malaysia.

**atiyyah@uitm.edu.my*

ABSTRACT

On average, women normally menstruate within a span of 7 to 15 days each month, which makes sanitary pads a necessary item for them. In 2018, sanitary pads held a majority share at 79% of the feminine hygiene market. However, they have taken over landfills as one of the most common wastes, and they take a long time to disintegrate. To address this issue, this project was initiated to create eco-friendly sanitary pads using banana stem waste, which is a byproduct of the harvest. The project aimed to determine the maximum absorption of liquid and wicking capacity of the pads from banana stem fibre, and then compare them with that of commercial brands. Four types of pads were produced, which vary by the number of layers. The results revealed that the pads made from four layers of banana fibre sheet had the highest wicking ability and absorbed up to 70 ml of liquid, comparable to the commercial pad, Libresse. Hence, it can be concluded that the ability of banana fibre sanitary pads to absorb liquid is proven to be equivalent to that of commercial pads. By further exploring this study, banana stem fibre sanitary pads could have the potential to replace traditional pads, reducing waste from used sanitary products and banana trees.

Key Words: Banana Plant Waste, Banana Fibre, Sanitary Pads, Absorption, Wicking.

1. INTRODUCTION

During menstrual periods, women require a sanitary pad to absorb menstrual fluid and prevent leakage and discomfort. Numerous companies have produced a variety of sanitary pads based on women's preferences. Some of the successful companies are Kotex which is part of Kimberly-Clark brands and Essity which produces Libresse. However, the high percentage of plastics in most non-biodegradable pads which is around 90% might take 500 to 800 years for one to disintegrate. Thus, it could lead to uncontrollable disposal of sanitary pads if there is no movement from higher-ups. A lot of news has been circulating lately regarding the severity of environmental issues, which is concerning in the long run.

As the world is now looking for a green substitute, disposable pads are gaining popularity. For instance, an Indian company called Saathi Pads has introduced compostable and biodegradable sanitary pads using locally sourced banana and bamboo which only take 6 months to decompose (Kiran, 2022). In Malaysia, banana is the most-produced fruit and have been planted on almost 35,000 hectares equivalent to 24% of Malaysia's total fruit production (Tumin & Shaharudin, 2019). Furthermore, almost 60% of banana biomass is wasted after harvest. Rather than burning the banana plant waste after harvest or making it idle on the farm, the plant waste could be reused. Collecting banana plant waste from banana farmers might also benefit them because they will earn from such wastage. Therefore, this project intends to produce sanitary pads from the waste of banana trees, and it is implemented as a measure to reduce waste. The liquid absorbency of the produced sanitary pad

will also be determined and compared with that of the commercial brands.

2. MATERIALS AND METHODS

The main materials used for this project are the banana stems which were collected from an orchard in Kuala Selangor, Malaysia. Other materials including distilled water, sodium hydroxide, water and red dye were obtained from the Textile Technology Laboratory in Universiti Teknologi MARA Cawangan Negeri Sembilan.

The methods to produce the pads started with the process of separating the banana stem from its foliage, thoroughly cleaning them with tap water to remove all contaminants, and then cutting them into some sections. To extract fibre from the banana stem, it was first cut into several pieces and put in the banana fibre extraction machine. A 200 ml sodium hydroxide (NaOH) solution was mixed with banana stem fibre that had been cut into small pieces. Immediately the mixture was boiled for one hour at 100°C before being chilled for about an hour. After cooling, the mixture was poured into a mould with the desired shapes. The banana sheets were formed after the mixture had dried in the sun.

The pads were produced in four versions where the variation lies in the number of layers of banana sheets. Next, all the samples were tested for their maximum absorption capacity. While recording the time for every 30-second interval, 5 ml water was dropped on the pads each time until the pads began to leak. Additionally, 5 ml liquid was dropped on the pad to see how long it took to absorb all of it. This is also termed a revised wicking test where the aim is to measure how fast liquid can be absorbed into the fabric. The times were recorded until all liquid was absorbed in the pads. Red colour dyes were added to the liquid to ease visual observation.

Figure 1. Parts of the manufacturing process of sanitary pads from banana fibres – left: separation of the stem from foliage, right: drying the fibres under the sunlight.

3. RESULTS

The pads were made with four variations of various layers. Figure 2 shows the pads and the layers of banana fibre sheets.

Figure 2.: Left: banana fibre sheets, right: example of a finished product of sanitary pad from banana fibres.

Table 1 shows the properties of the banana fibre sanitary pads in which the weight and length for each banana fibre sheet were kept constant at 1.80g and 15cm respectively. To compare the performance of the produced pads, two types of commercial pads were also tested. The size of commercial pads is bigger which is 24 cm for both brands which is the common size available in the market.

Table 1: Properties of The Banana Fibre and Commercial Sanitary Pads

Number of layers	Weight (g)	Length of pads (mm)	Thickness (mm) (SD*)
1	1.80	15	1.10 (0.27)
2	3.60	15	2.25 (0.47)
3	5.40	15	2.80 (0.30)
4	7.20	15	4.04 (0.66)
Kotex	7.14	24	3.70 (1.00)
Libresse	6.93	24	3.16 (0.25)

SD* - standard deviation

Figure 3 shows the results of the maximum absorption and revised wicking test. Based on the graph, four layers of banana fibre sheet sample absorbed the fastest which was 0.78 ml/s. However, the first 3 samples were only able to absorb below 0.50 ml/s. Sample 4 also absorbs liquids quicker than Kotex and Libresse, which are known as common brands for sanitary pads in Malaysia. Kotex was only able to absorb 0.38 ml/s of liquid meanwhile Libresse is 0.45 ml/s. As per Table 1, the four-layer sample is the thickest among other samples, measuring 4.04 mm. This thickness affects the result as the thicker the sample, the more liquid can be absorbed in a given time (Memariyan & Ekhtiyari, 2010).

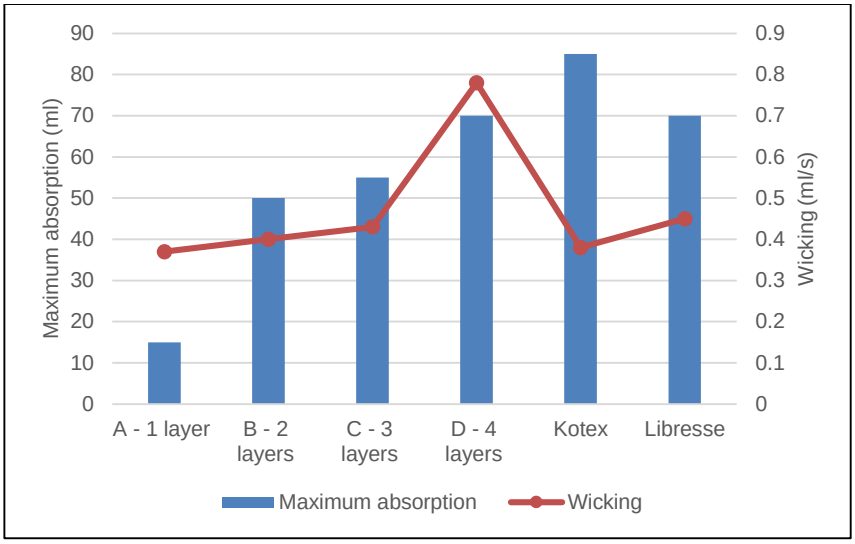

Figure 3. Maximum absorption and wicking of sanitary pads from banana fibres and commercial brands

However, a sample from a commercial brand, Kotex has the highest absorption capacity which is 85 ml, much higher than another commercial brand Libresse and all banana fibre pads. Nevertheless, four layers of banana sheets and Libresse seem to have a comparable amount of absorption at 70 ml, which is the second highest after Kotex. Hence, it can be considered as having an excellent absorbency as commercial pads and potentially be commercialised in the future.

4. CONCLUSIONS

Four types of pads with variations in the number of layers were produced. From the study, it was found that four layers of banana fibre sheets have the maximum absorption, comparable to the commercial pads tested. As for wicking, four layers of banana sheet pads absorb the quickest compared to others with a lower number of layers, and commercial brands. Despite the great potential of banana fibres as sanitary pads, there are still many parts that need to be further researched especially on the comfortability and hygienic issues of the materials.

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GAME-BASED LEARNING OF SCIENCE SUBJECT FOR PRIMARY SCHOOL

Siti Rafidah Muhamat Dawam, Muhammad Alif Haikal Rosli, Mazura Mat Din, Shaifizat Mansor, Taniza Tajuddin, Noor Rasidah Ali

Universiti Teknologi MARA Cawangan Kedah

srafidah192@uitm.edu.my

ABSTRACT

An alarming statistic in Malaysia education roadmap according to the National STEM Association (NSA) shows that only 19 percent of students in secondary level opted to a science stream since 2020. Among the contributing factors to the lack of interest related to this matter begin at the primary school level which is the uninteresting method of teaching and learning, and the extensive syllabus that leads to difficulty of understanding. Current implementation of teaching and learning in this subject is conducted conventionally and less interactive. Thus, student find the subject is difficult to understand and unexciting. A game-based learning inspired by “Saidina” board game were constructed to attuned for this purpose, namely Saidina Sains Tahun 6 which consists of four challenging Science topics specifically, ‘Mikroorganisma’, ‘Interaksi Antara Hidupan’, ‘Pemeliharaan Dan Pemuliharaan’ and ‘Kestabilan dan Kekuatan’. The game is created to help year 6 students improve their understanding of science subjects on the above topics. A total of 20 respondents was involved in this pilot study whom 90 percent agreed that the procedure or game plan in this method of learning game is clearly described in the rules form with majority agreed that the game is easy to use. 95 percent respondents also support that the game can increase their knowledge in science subject, therefore agreed to use this game in the future and will recommend it to others.

Key Words: science, game-based learning, primary school, teaching, and learning.

1. INTRODUCTION

An alarming statistic in Malaysia education roadmap according to the National STEM Association (NSA) shows that only 19 percent of students in secondary level opted to a science stream since 2020. Among the contributing factors to the lack of interest related to this matter begin at the primary school level which is the uninteresting method of learning and teaching, and the extensive syllabus whereby leads to difficulty of understanding. Therefore, Prime Minister has urged the Ministry of Education (MOE) and the Ministry of Science, Technology, and Innovation (MOSTI) to find new teaching and learning approaches to attract students to Science and Mathematics subjects.

Teaching and learning of science subject for primary school can be amplified through game-based approach. Current implementation of teaching and learning in this subject is conducted conventionally and less interactive. Thus, student find the subject is difficult to understand and unexciting. A game-based learning inspired by “Saidina” board game were constructed to attuned for this purpose, namely Saidina Sains Tahun 6 which consists of four challenging Science topics specifically, ‘Mikroorganisma’, ‘Interaksi Antara Hidupan’, ‘Pemeliharaan Dan Pemuliharaan’ and ‘Kestabilan dan Kekuatan’. The game is created to help year 6 students improve their understanding of science subjects on the above topics.

This tool has fashioned two innovativeness namely, the incorporation of complicated concepts from science into the game as well as the use of scientific terminology to describe the locales on the game board.

Regarding product applicability, students will engage in more perceptive active learning because they are familiar with the game. Consequently, advocating STEM as the future career of choice and the primary focus for students.

2. BACKGROUND OF THE STUDY

Recent research shows that gamification in teaching and Learning give a positive impact in students understanding and motivates them to explore further on the subjects. (Rowicka and Postek, 2013), Krath et al., 2021), (Taspinar et al., 2016), (Parra-Gonzales et al., 2021), (Annunpattana et al., 2021). amification concept introduced in schools can be divided into physical and digital based tools. Tools created is executed following an innovative and engaging methodology to motivate students and enhance their learning process. However, despite an increasing academic interest, teachers' attitude towards gamification in the past years, an actual use of gamification remains a neglected research area.

This would, in turn, suggest that more works and awareness is needed to introduce this concept, not only for motivations that shape students' learning experience but rather the opportunity created for those students (by their teachers and by the system) to follow the needs and motivations they naturally have.

Thus, the gamifications tools or games created should be design and tested in a manner that are effective and meaningful for learners. The subject of this invention is a Saidina-inspired game-based learning program called Saidina Sains Tahun 6, which covers scientific topics and is discussed in detail in the next section.

3. PRODUCT DEVELOPMENT

The product is development by taking into consideration on user requirements, product development and product testing. Each phase is discussed further in the next sections.

3.1. User Requirements

Several interview sessions have been conducted on standard six science teachers and students at multiple schools in Kedah to identify the most challenging topics in science subject. The results consensually identified four most challenging topics which are Mikroorganisma', 'Interaksi Antara Hidupan', 'Pemeliharaan Dan Pemuliharaan' and 'Kestabilan dan Kekuatan', thus will become the prime case study introduced in this game.

3.2. Product Development

The product is inspired from the Saidina board game; therefore, it is named Saidina Sains Tahun 6, as shown in Figure 1. The workings of the game include a game instruction regarding the chosen topics to became 4 sets of question cards together with answers, a land grant, dice, the replica of the house and hotel and utilising Malaysian currency systems. At one time, the game play can only be participated by maximum of four players/students, including a banker. Each player must take turn on tossing the dice and based on numbers acquired will determine the actions of that player during stopover process. The game will iterate until all the cards and assets on the board were used up and acquired by the players to determine the winner of the game.

Aside from its practicality, this alternative teaching and learning tool can also stimulate student creativity by encouraging independent study and urging the player to employ strategy and careful planning.

Figure 1. Saidina Sains Tahun 6 Game Board

3.3 Product Testing

A set of questionnaires was set up which consist of questions related to usability of the game. Convenient sampling techniques was used in this study and the board game is tested among twenty 'Standard Six' students at different schools. The science teacher was present as a facilitator to observe the teaching and learning process during the board game practice.

4. RESULTS AND DISCUSSION

A total of 20 respondents (Year 6 students) and their teachers was involved in this pilot study for usability testing as well as in teaching and learning experience. Results shows that 90 percent agreed that the procedure or game plan in this method is clearly described in the rules form and is easy to use, whereas 95 percent respondents support that the game can increase their knowledge and understanding in science subject related topics. Teachers feedback on the games acknowledging that the method can help their delivery on difficult topics and to spam an interest among students for the science subjects. Subsequently, all the users agreed to use this game in the future and will recommend it to others.

Three parties, namely the Ministry of Education, educators, or teachers, and particularly pupils, may benefit from the novelty of this idea. By 2050, the Ministry of Education can support the country's transition by increasing STEM enrolment with the aid of this invention. While this product, like Saidina Sains Tahun 6, can be a novel approach and instrument for teaching and studying science through gamification for educators and teachers. Regarding the students, this product has the potential to increase their interest and involvement in the classroom.

It is anticipated that this invention will lead to novel insights into the most difficult science subjects' teaching and learning methodologies. The publication of research in a SCOPUS, refereed, or indexed journal is another anticipated result. This invention has applied for intellectual property rights (IPR LY2023P04214) and joined a competition for innovative ideas like INVENTOPIA. Another anticipated result is the eventual gamification of Saidina Sains Tahun 6 through digital means.

5. CONCLUSION AND RECOMMENDATION

In conclusion, this game-based Saidina Sains Tahun 6 can spark curiosity and help kids gradually understand sciences and mathematics. There are three opportunities for commercializing a product. Online games or digital gamification of Saidina Sains Tahun 6 come first with more science topics can be introduce as well. Second, this product appeals to kids as a learning game that can be played indoors. And finally, expanding the usefulness of online gaming.

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ENHANCING TAXPAYERS COMPLIANCE BY USING SNAP TO SAVE (S2S) APPS

Mohd Hafiz bin Bakar[1], Siti Norbaya binti Yahaya[2]

[1]Universiti Teknologi MARA Melaka, 78000, Alor Gajah, Malaysia

[2]Universiti Teknikal Malaysia Melaka,76100, Durian Tunggal, Malaysia

hafizbakar@uitm.edu.my

ABSTRACT

The Snap to Save (s2s) application was developed to assist and enable the taxpayers to keep, monitor and track their spending record for the purpose of income tax declaration every year. The taxpayers eligible for tax relief by declaring their purchase for previous year spending according to the relief items provided by Inland Revenue Board of Malaysia (LHDN). This can contribute to the tax compliance among the taxpayers. Accuracy and complexity of tax has a significant on tax compliance in Malaysia. The taxpayers can utilise this Snap to Save (s2s) tool to help them record their purchases for that specific year, including the date, items, amount, and receipts. The taxpayers need to keep the proof of purchase of that item for at least seven years and this application can assist them accordingly. The word “snap” refers to capture the receipts and will keep on their own drive. The word “SAVE” refer to the systematic way of recording their purchase, where every item that they declare to claim the tax relief is very valuable and it can save a lot of time and energy for the taxpayers in tracking their records efficiently. This app is very user friendly and easy to use. The development of Snap to Save (s2s) application is using the Google Appsheet where all the sections coordinate with the data we created in Google Sheets to the apps directly. It can be installed for Android and iOS user. After snap the receipt, user need to fill in their spending details on the entries column and it will appear in the summary of spending folder. All the data will store directly to the user drive, and they can track and manage it consequently either from their handphone or laptop. Thus, this app will assist in term of managing the taxpayers supporting document when doing their income tax declaration. Snap to Save (s2s) application can save a lot of time and energy of the taxpayers and it can contribute to systematic and efficient process during the declaration of income tax. The most important thing is this will encourage a tax compliance among the taxpayers in Malaysia.

Key Words: Snap, Systematic, Accurate, Value, Efficient.

1. INTRODUCTION

The Snap to Save (s2s) application was developed to assist and enable the taxpayers to keep, monitor and track their spending record for the purpose of income tax declaration every year. The taxpayers can get a tax relief by declaring their purchase for previous year spending according to the relief items provided by Inland Revenue Board of Malaysia (LHDN). This can contribute to the tax compliance among the taxpayers. According to Saad (2014) the study relates the tax non-compliance to income, attitude, perceived behavioural control, tax knowledge, complexity, and fairness in Malaysia. Usefulness and complexity of tax has a significant on tax compliance in Malaysia (Ibrahim, 2013). The taxpayers can use this Snap to Save (s2S) application to assist them to record their purchase in terms of date, items, amount, and receipts for those years. The taxpayers need to keep the proof of purchase of that item for at least seven years and this application can assist them accordingly. The word “snap” refers to capture the receipts and will keep in their own drive. The word

"SAVE" refer to the systematic way of recording their purchase, and they can accurately key-in in the LHDN system. Every item that they declare to claim the tax relief is very valuable and it can save a lot of time and energy for the taxpayers in tracking their records efficiently. This app are very user friendly and easy to use.

2. METHODOLOGY

The development of Snap to Save (s2s) application is using the Google Appsheet where all the sections coordinate with the data, we created in Google Sheets to the apps directly. It can be installed for Android and iOS user. After installed, user need to fill in their spending details on the entries column and it will appear in the summary of spending folder. It also provides the types of expenses eligible for tax relief that user can refer to. Figure 2.1 shows a screenshot of Snap to Save (s2s) Apps as below:

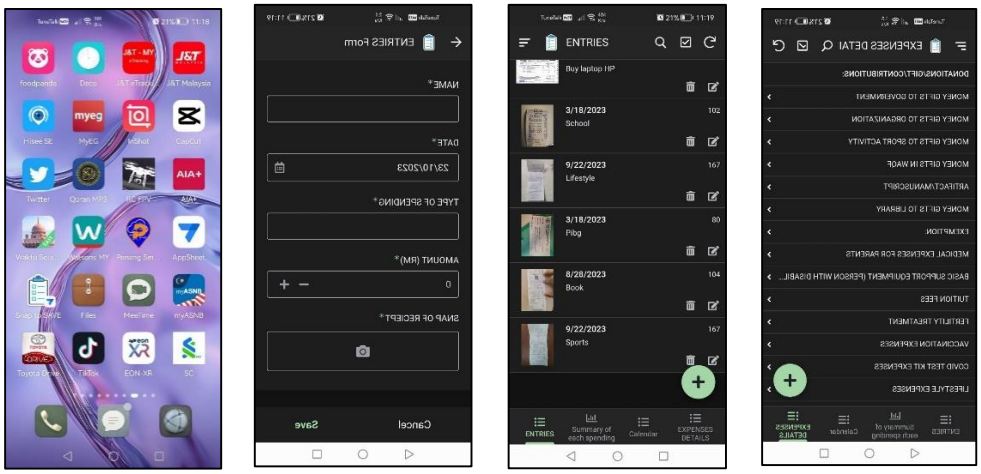

Figure 2. Four screenshot of Snap to Save (s2s) Apps

3. RESULTS & DISCUSSION

All the data will store directly to the user drive, and they can track and manage it consequently either from their handphone or laptop. Thus, this app will assist in term of managing the taxpayers supporting document when doing their income tax declaration.

4. CONCLUSION

Snap to Save (s2s) application can save a lot of time and energy of the taxpayers and it can contribute to systematic and efficient process during the declaration of income tax. The most important thing is this will encourage a tax compliance among the taxpayers in Malaysia.

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ASSIST YOUR PERSONAL WELLNESS AND SELF-CARE WITH ARTIFICIAL INTELLIGENCE BUDDY: *ALIVE*

* Zuhal Hussein[1], Che Nur Asmani Amirah Che Mohd Nawi[1], and Che Nur Asmani Amira Che Mohd Nawi[1]

[1]Universiti Teknologi MARA Cawangan Kelantan, Kampus Kota Bharu

** Corresponding author's email: zuhal@uitm.edu.my*

ABSTRACT

In today's swift world, maintaining personal wellness has become an extreme concern. Artificial intelligence (AI) has emerged as a powerful ally in this endeavour, offering innovative solution through mobile health applications. This mobile health application diary 'Alive' explores the concept of AL buddy, a mobile health application designed to assist individuals in enhancing their personal wellness and self-care routines. 'Alive' diary leverages the capabilities of AI to provide personalized support across various functions of personal wellness, including mental well-being, physical health, and lifestyle management. Through the artificial intelligence-driven algorithms, the mobile health application analyses user data, such as sleep patterns, food intake, daily activities levels, diet preferences, stress indicators, and meditation, to provide tailored recommendations and insights. The key features of Alive diary include real-time health monitoring through wearable devices, such as smartphone and smartwatches, and mental health support through AI chatbots, medication management reminder, sleep pattern, health management such as exercise, healthy food, social support, and access to telehealth services. The applications also aid in health behavioural change and promote healthy lifestyle. In addition, Alive diary buddy empowers users to customize their sleep pattern, fitness routines, access to healthcare information, have to-do list, and other interfaces with engaging design. It optimizes the potential of the application as a comprehensive tool for encouraging personal wellness and self-care, bridging the gap between individuals and healthcare resources. By tackling the potential of Alive diary buddy, this mobile health applications paves the way for a healthier, more proactive, more informed, and well engaged approach to self-care in the digital age, the era of digital health.

Key Words: Artificial intelligence, mobile health application, health diary, wellness, self-care

1. INTRODUCTION

Initially, information technology systems were primarily utilized for documenting patient information. However, the rapid advancements in technology over the years have paved the way for the application of data analytics and machine learning (ML) in the healthcare sector (Bhatt et al., 2022). The integration of advanced artificial intelligence (AI) techniques with the rapid adoption of medical Internet of Things (IoT) devices has spurred increased research in the fields of digital healthcare and preventive medicine (Barrett et al., 2019). This research focuses on mobile health (mHealth) applications, which are employed to monitor serious conditions such as asthma, diabetes, and sleep apnea, ensuring the well-being and safety of patients (Guillodo et al., 2020). mHealth has emerged as a critical sector within the healthcare information technology industry, experiencing significant growth in recent years. This growth has been driven by the proliferation of wearable technologies, mobile sensors, and the exponential increase in the number of IoT devices in general (Tang & Ho, 2019).

Mobile diary apps have been utilized in various fields, including psychology and healthcare, for a number of years. They serve the purpose of documenting behavioural patterns, such as leisure activities and dietary habits, and are sometimes employed as tools to gain insight into the emotions and motivations associated with these behaviours (Nurmi et al., 2020). The widespread use of

smartphones, which people carry with them throughout most of the day (Bol et al., 2018; Klasnja & Pratt, 2012), has made these devices invaluable for self-reported measurements. Consequently, there is an increasing trend to harness their advantages in behavioural studies as alternative technologies for collecting self-reports.

Mobile apps can also issue prompts to users to ensure they complete their journal entries, enable real-time reporting tracking, and filter out retrospective reporting. Another benefit of using mobile diaries is the absence of stringent physical space requirements in contrast to traditional paper diaries (Jimoh et al., 2018). Data can be sent back and processed online in a transparent manner, unlike paper diaries, which encounter logistical challenges in terms of distribution to users and subsequent collection by research teams. Furthermore, due to the time elapsed before all diaries are received and processed, the publication of data may be subject to delays.

As a fast-growing area of mobile health applications, health diary apps have been increasingly used by people beyond the use of conventional to-do lists. A health diary app is a mobile application designed to help individuals maintain a record of their health-related information and activities. These apps are typically used for tracking and managing various aspects of personal health and wellness. Common features that can be benefited from health diary apps include symptom tracking, tracking, and monitoring sleep patterns, diet and nutrition logging, stress indicators, meditation management, as well as journaling users' feelings, experiences, and thoughts related to health and well-being driven by the artificial intelligence algorithm.

Artificial intelligence (AI) refers to creating computer systems that can carry out functions traditionally associated with human intelligence, including tasks like perception, reasoning, and decision-making (Dave & Patel, 2023). Within the healthcare domain, AI is harnessed for the analysis of extensive patient data, encompassing medical records, diagnostic images, and laboratory findings, with the aim of enhancing clinical decision-making and enhancing patient outcomes. Machine learning is a subarea of artificial intelligence that involves the development of models and algorithms that can learn from data.

The synergy between AI and mHealth technologies plays a pivotal role in advancing the establishment of remote healthcare infrastructure, offering enhanced insights to medical professionals, and serving the well-being of countless patients. Therefore, AI in health diary apps can help personalize users' health information and data, such as medical records and lifestyle information. Prior research focusing on the application of AI and health diary apps on personal health and well-being has found a significant impact on the use of health diary apps on various conditions. For example, Shim & Hwang, (2016) found that the experimental groups showed significantly higher scores for exercise-related self-efficacy and self-care adherence after using a calendar-typed health diary. Compared to paper diaries, health diary apps such as dietary apps are easier to use and effective in regard to recording data and are less time-consuming, but frequently come with technical issues and a boring interface (Jimoh et al., 2018).

2. METHODOLOGY

This present study was a developmental study to design and develop a mobile-based self-care application to help individuals maintain a record of their health-related information and activities as well as for tracking and managing various aspects of personal health and wellness. The design and development of the Alive mobile diary app were conducted in three main phases:

2.1 Identify potential users and platform.

To identify the potential users who will use this mobile diary app, the study has blasted a short and simple online survey to the general social media users on several platforms, such as Facebook, Instagram, WhatsApp, and Twitter. In the survey form, the social media users were asked several questions, which are: *type of mobile operating system used by the users, such as Android or iOS; do you have experience using personal wellness and self-care app or are you currently using the app;*

what kind of features are important to the mobile-based self-care app; are you using the personal wellness and self-care app for a specific purpose? This survey assisted in generating ideas, focusing and leading the development of features and the design of the Alive mobile diary app.

2.2 Determine the key features and capabilities.

To identify and determine the key features and capabilities of the Alive mobile diary app, the study used the data obtained from the survey done in phase 1. Several personal wellness and self-care diary applications were downloaded and examined. The information and data gathered from the survey and the applications were combined and analyzed. A checklist of the required key features and capabilities of the personal wellness and self-care application was prepared and presented to the members. A list of key features was finalized to assist in creating prototype for the Alive mobile app. Based on the key features of similar available mobile diary applications, the study has identified the design and development of the mobile diary application were divided into two parts: first for user registration and profile, and the second is home page for daily uses and features of the apps.

2.3 Design and development of Alive App

The design and development of the Alive mobile diary app focused on personal wellness and self-care assistants consisted of determining the model for the app, accessibility, and users' expectations, designing the prototype, preparing the initial version, and finalizing the actual version. The study used UI/UX software to create the mobile app prototype, the original version, and databases. After receiving the users' information, the app will keep the user's data and send the information to databases before sending a notification to the user's mobile phone. The users will be able to save, edit, and update their information and profile at any time. After completing the profile and users' information, the users can start using all the features for updates, keying information, checking status, and others. Importantly, the Alive app will set user limit access so that only one username and profile can be used for one user. This limit is to protect the users' privacy, data, and security while using the app. The Alive health diary app is available for download from the Google Play Store for Android users.

3. RESULT & DISCUSSION

We have identified the core model and a set of functions for the Alive health diary app. To use the app, users must create an account during their initial login after installation. Once registered using email, they can log in by providing a username and password. One of the important features of the Alive app is the personal health record, which allows users to record information about their health, illnesses, and journals. Users can simply view and manage their information in their user profile. This app will be developed using the JAVA programming language and the Android operating system (AOS), which is more cost-effective due to the widespread adoption of smartphones. Through the content analysis of different mobile dairy applications in mobile stores and the survey by the authors, several features will be extracted into the app, and users can choose features they want to track, such as social, hobbies, daily diary/journal, sleep, health, food, meditations, physical exercise, and others.

Utilizing health diaries, particularly through smartphone applications, offers individuals a way to overcome the haziness of their memory, assess their health objectively, and identify their healthcare needs (Shim & Hwang, 2016; Wolf et al., 2016). Smartphone-based health diaries are effective in enhancing the lifestyles of chronic patients and yield higher user satisfaction compared to traditional paper diaries, largely due to their greater flexibility in terms of time and space (Yoo & Suh, 2021). Moreover, the dependable content within these diaries makes them a reliable source of data. In summary, the use of application-based health diaries can be a key strategy for encouraging patients to actively engage in self-care, enabling them to regularly monitor their health status, and instilling confidence in managing their medical conditions (Jimoh et al., 2018). Thus, with the benefits of health

diary apps towards personal wellness and self-care as discussed, we aim to develop the desired applications for this purpose.

A mobile health diary app is of paramount importance for our personal well-being because we cannot manage everything on our own. Hence, having an assistant that aids us in overseeing and maintaining our individual health and wellness is indispensable. This app serves a critical role in health monitoring, disease management, and empowering us to be in charge of our well-being, among other functions. Therefore, it plays a crucial part in enhancing and sustaining our overall health. An advanced health diary, enhanced by artificial intelligence, will assist us in monitoring, managing, and comprehending our health, ultimately resulting in improved well-being.

4. CONCLUSION AND RECOMMENDATION

In this research, we have designed and crafted a health diary app specifically tailored for adults. This innovative app exhibits promise in addressing the limitations observed in existing mobile applications geared towards health daily dairy. By employing our *Alive* diary app, we can introduce a comprehensive self-care solution, encompassing features such as AI chatbots, medication management reminders, sleep patterns, health management such as physical activity suggestions, healthy food, social support, lifestyle behaviour tracking, and access to telehealth services. Interest in mobile-based self-care diary apps has persisted over the years, with many robust applications yet to be developed. Future research endeavours are warranted to expand the scope of health diary apps covering various facets of personal self-care or specifically for other age groups such as older adults with specific health conditions like cognitive impairment and Alzheimer's disease or children's diaries.

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EMPOWERING NEXT-GEN EDUCATION ON ISLAMIC FINANCE WITH AI-ENHANCED, INTERACTIVE ASSESSMENTS AND LEARNING TECHNOLOGY

Nor Halida Haziaton Mohd Noor[1], Noridah Abu Bakar[2*],
Wan Yusrol Rizal Wan Yusof[1]

[1]Universiti Teknologi MARA, Kelantan
[2]Universiti Teknologi MARA, Shah Alam

noridah96@uitm.edu.my

ABSTRACT
In today's fast-paced and interconnected world, the traditional modes of education are evolving at an unprecedented pace. This e-learning project represents a pioneering initiative at the intersection of education, technology, and Islamic finance. The aim of this effort seeks to revolutionise the way individuals' worldwide access and comprehend complex financial principles and legal frameworks and governance within the context of Islamic finance. Leveraging the power of Massive Open Online Courses (MOOC) platforms, this project fosters accessibility and inclusivity by providing a learning environment that transcends geographical boundaries and demographic constraints. It aims to make learning more meaningful and enjoyable by offering a dynamic platform for learners of all backgrounds and levels of expertise. Central to this innovation are the meticulously integrated AI lecture videos and interactive learning materials, which serve as engaging and comprehensive learning resources. These videos not only elucidate intricate concepts but also invite learner participation through comments and discussions. Furthermore, the incorporation of interactive self-assessment tools, coupled with leaderboard gamification, ensures that learners can measure their progress, compete, and collaborate with peers. The project envisions a future where anyone, regardless of their geographical location or prior knowledge, can access high-quality education on Islamic financial legal frameworks and governance. By harnessing the capabilities of AI-enhanced technology, interactive assessments, and multimedia content, this initiative strives to empower the next generation of learners, equipping them with the knowledge and skills needed to navigate the dynamic landscape of Islamic Financial Legal Framework and Governance course effectively. In doing so, it contributes to the broader goal of promoting financial inclusivity and fostering a more informed global community in the realm of Islamic Financial Legal Framework and Governance course.

Key Words: AI, *e-learning, Gamification, Islamic Finance, MOOC*.

1. INTRODUCTION

Islamic Financial Legal Framework and Governance course should align with technology to ensure that the new generation of students can effectively grasp the subject matter. Hence, the primary aim of this Massive Open Online Course (MOOC) project is to align with the requirements of contemporary teaching and learning. Some MOOCs merely replicate conventional teaching pedagogies, incorporating multimedia elements such as video lectures. In contrast, others venture further by striving to actively involve the vast number of participants through the encouragement of discussions and by depending on their contributions to the course, as noted by Alario-Hoyos et al. (2013).

To further enhance and keep pace with evolving technology, artificial intelligence (AI) elements have been integrated into this MOOC project. AI creates and provides more effective online materials as it increases visual perception, legibility, readability, reading comprehension, and memorability of content (Mackare & Jansone, 2019). This Islamic Financial Legal Framework and Governance MOOC offers a comprehensive array of materials, including hand-out notes, instructional videos, assessments, supplementary resources, and a dedicated feedback section.

Delivering the teaching and AI videos stands as a cornerstone in these courses. It becomes particularly intriguing to explore innovations that enable users to engage in multimedia interactions and collaborative activities within the videos, as highlighted by Monedero-Moya et al. (2015). In addition, the adoption of methodologies and practices from distance learning (MOOC) and gamification is a promising basis to facilitate the design of a new generation of MOOCs (Leung et al., 2023a)

A game-based assessment tool holds the potential to boost learning motivation and concentration while also autonomously evaluating the effectiveness of the learning process. Nonetheless, in the context of online education where learners largely self-manage their learning experiences, issues such as diminished motivation, reduced concentration, and lower completion rates have emerged as notable challenges. Findings by (Leung et al., 2023b) add to Self-Regulated Learning theory (SRL) theory by demonstrating that gamification designs can enhance SRL engagement and learning outcomes in online learning. Supported by Jo et al. (2023), a sufficiently high potential was identified regarding the educational usability of the game-based assessment tool.

2. PROJECT COMPONENTS

This Islamic financial legal frameworks and governance MOOC comprises 8 chapters, each structured uniformly. The design prioritises user-friendliness and encourages active engagement. Music also has been integrated with interactivity to enhance the learning experience. With regards to a study conducted by Bonk et al. (2018) that introduced multimedia and other elements to personalise their massive courses found that a significant majority of the respondents expressed a strong or moderate interest in learning new techniques to personalise their forthcoming MOOC offerings. In accordance with MOOC requirements, the key resources and tools integrated into the MOOCs encompassed discussion forums, video lectures, handout notes, and self-assessment components.

2.1 AI Video to Enhance Understanding

In this Islamic Financial Legal Framework and Governance MOOC project, the AI-powered video component has been introduced. Within each chapter, the content is seamlessly integrated with AI in video technology, with the goal of delivering a personalised, interactive, and highly effective learning experience. This integration ultimately enhances the comprehension of educational material. A sample of AI video can be observed in Figure 1 below.

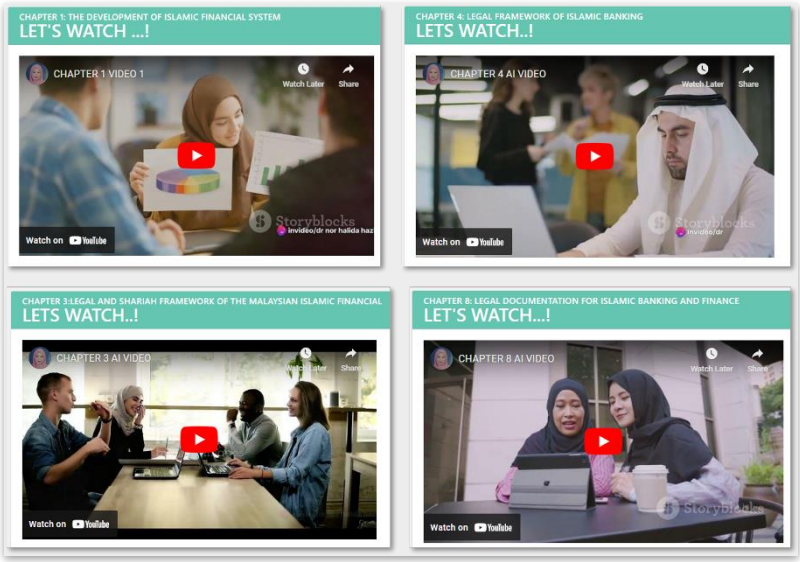

Figure 1. Samples of AI Videos

2.2 Use of Multimedia for Modern Learning Experience

Utilisation of multimedia as a learning technology in MOOCs course can transform the educational landscape of Islamic financial legal frameworks and governance course by offering engaging, accessible, and effective learning experiences. Indeed, using animated GIFs can be a valuable addition to the learning environment. This approach has the potential to benefit a wide and diverse audience of learners by making educational content more visually appealing, interactive, and comprehensible. When thoughtfully integrated into the learning materials, animated GIFs have the power to enhance the overall educational experience and contribute to improved retention and understanding of the subject matter. Moreover, this type of multimedia component can be easily integrated into online courses and learning platforms, ensuring accessibility for a wide range of learners. It often has a fun and informal quality, which can make learning more enjoyable and less intimidating.

In this project, the topics are presented in a GIF format, utilizing multimedia principles, where text is animated with attractive colours and legible fonts. The image size is optimised for easy viewing and readability. Samples of topics within the Islamic financial legal frameworks and governance MOOC system is presented in figure 2.

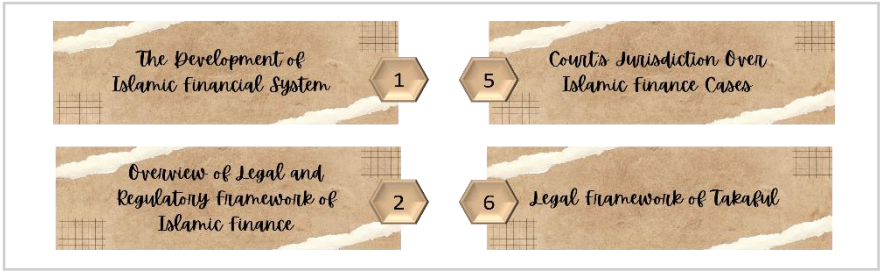

Figure 2. Samples of Topics Using Multimedia Element

2.3 Interactive Assessment

Gamification has been strategically chosen as an integral element for this Islamic financial legal frameworks and governance MOOC with the primary aim of enhancing learner engagement and fostering interactivity. Gamification tools make learning more interactive and engaging, capturing learners' interest and motivating them to actively participate in educational activities. It also helps to improved retention by incorporating game elements such as challenges, rewards, and competition, these tools facilitate better retention of information and concepts, leading to more effective learning outcomes.

Figure 3. Samples of Interactive Assessment

Wordwall online tools have been employed to fulfil this objective. Samples of the assessment are displayed in Figure 3 above. While the question type has been standardised using multiple-choice questions, a deliberate selection of diverse themes has been made to differentiate between topics and introduce an element of enjoyment. Various colours have been thoughtfully employed to enhance learner engagement and promote interactivity.

3. CONCLUSION AND RECOMMENDATION

In conclusion, the development project for this Islamic Financial Legal Framework and Governance MOOC, strengthened by multimedia elements, interactive assessment tools, and AI-powered video technology, has paved the way to empower the next generation of education in the field of Islamic financial legal frameworks and governance. This innovative approach has not only enhanced the accessibility and comprehensibility of the subject but also opened new avenues for students to engage with and master the intricacies of Islamic financial legal frameworks and governance in a dynamic and technology-driven learning environment.

This innovative approach not only enhances engagement and motivation but also fosters personalised learning experiences. As we embrace the transformative power of technology in education, the potential for broader access and more effective learning outcomes in the digital landscape becomes increasingly promising. This project represents a significant step forward in the evolution of education, striving to meet the dynamic needs of modern learners and empower them with the tools to succeed in an ever-changing world.

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CoSa MANAGEMENT SYSTEM 2.0

[1]Ling-Ling, Ung [2]Mohd Muizzuddin Arif Bin Moni [3]Emmanuel Shanmuganathan

[1,2,3]College of Computing, Informatics and Mathematics
Universiti Teknologi MARA (UiTM)
Sabah Branch, Kota Kinabalu Campus
Locked Bag 71, 88997 Kota Kinabalu Sabah Malaysia

ungli720@uitm.edu.my

ABSTRACT

The CoSA Management System represents an innovative technical solution that significantly transforms member involvement within the College of Computing, Informatics and Mathematics (KPPIM) at the UiTM Sabah Branch. The system aims to automate the member registration process and establish a consolidated platform for efficient information transmission, thereby serving as a catalyst for boosting the faculty experience. The primary objective of the CoSA Management System is to optimize the complex procedures involved in member registration. The system's implementation greatly enhances the registration process's efficiency by transitioning from manual procedures to a user-friendly digital platform. This transition eliminates the need for laborious paperwork and reduces the time spent waiting for registration. The innovation has a broader reach, as its aim is to cultivate a cohesive community within the KPPIM by providing a centralized platform for members to obtain up-to-date information on events, programs, workshops, and news. Implementing a centralized strategy enhances communication and fosters a sense of togetherness among the members. The system's efficacy relies on its comprehensive features, which effectively meet the diverse needs of KPPIM members. The platform enables streamlined registration for various events, seminars, workshops, and other activities, utilizing technology to ease a previously intricate procedure. Furthermore, individuals are granted the authority to independently oversee their registrations, encompassing tasks such as modifying personal information and terminating their involvement, all inside the user-friendly interface. The empowerment described aligns with the underlying principles of CoSA, as it aims to provide a customized experience for every individual involved. The CoSA Management System is designed and developed based on the System Development Life Cycle (SDLC). This technique guarantees a methodical approach throughout the entire process, from the initial idea to the final implementation, ensuring the system's dependability, scalability, and long-term viability. The advantages derived from the CoSA Management System are significant. The system enhances administrative operations by implementing automation and centralizing member registration, saving time and resources for the institution and its constituents. The system ultimately transforms the dynamics of member engagement, promoting effectiveness, communication, and community development inside the KPPIM at UiTM Sabah Branch.

Key Words: information system; automation; digital platform; centralized; management

1. INTRODUCTION

Management Information Systems (MIS) are a key part of modern business because they help make things more productive and efficient. MIS is a way for an organization to gather, handle, store, and share information so that it can be used to make decisions and run more smoothly. Definitions have been given by well-known experts in the field. One definition of MIS from 2002 is "a system that provides information needed to manage organizations efficiently and effectively." It is what Laudon and Laudon (2018) call "a system that turns data into information and is used by an organization to make decisions." Finally, O'Brien and Marakas (2018) define MIS as "a system that gives managers and employees the information they need to make decisions."

MIS is all around us and a part of our everyday lives. When it comes to education, it makes administrative jobs like registering students, grading them, and keeping track of attendance easier, which makes staff and students more engaged. MIS helps with allocating resources, managing projects, and making decisions in organizational management, all of which have a big effect on how efficient and powerful a company is. On a daily basis, MIS is also used to keep track of inventory, handle payroll, and manage relationships with customers. Real-time data and automatic processes make it a very useful tool for modern businesses because they make sure that important tasks run smoothly.

Let's look at what happens at UiTM Sabah Branch, especially for students who are getting their Diploma in Computer Science, to show why MIS is important. Traditionally, registering students with the Computer Science Club of UiTM Sabah Branch (CoSA) has been done manually, which takes a lot of time and can lead to mistakes in the data. Without a central system, it has been hard to keep track of all the records of all the Computer Science students and the activities put on by the CoSa, such as who signed up for programs and how the events were run. Because of these manual processes, there is duplicate data, missing records, and trouble finding program details like locations, times, and people in charge of events like the Web Development Workshop and E-Waste Collection Day. The suggested CoSA Management System is an innovative way to deal with these issues. It would make registration easier, keep better records, and run programs more smoothly for both students and even the lecturers.

2. METHODOLOGY

The ADDIE model is used to plan the creation of the CoSA Club Management System. The steps are Analysis, Design, creation, Implementation, and Evaluation. Each step is necessary to make a system that works well and efficiently.

During the analysis part, the project team did a lot of investigation to learn about the system's goals and get feedback from UiTM Sabah Computer Science students. This included polls, interviews, and a full review of current procedures, which helped define the system's purpose and what users needed from it.

Before moving on to the design part, the architecture, database, and user interface of the system had to be carefully planned out. Mock-ups were used to see how users would interact with the site. Important parts of this stage also included choosing the right technology stack and planning how to collect data and show it.

After that, the CoSA Club Management System was coded and put into use during the development phase. A lot of testing and quality control was done on the system to make sure it worked as planned and met the standards of the initial analysis.

During the implementation process, real-world users (the students) were introduced to the system. They were given training and support to make sure they could use it easily. User feedback was very important for making the system easier to use and fixing any problems that came up.

Lastly, in the evaluation process, things like how fast people could register, how accurate the data was, and how engaged the users were all looked at. User feedback was very helpful in figuring out how well the system worked and where it could be improved. Using the ADDIE model made sure that the development process was thorough and well-organized.

3. RESULTS

After utilizing it successfully for a semester, the CoSA Club Management System has made a big difference in the COSa. Putting in place the system has not only made it easier for members to sign up, but it has also made it much easier to manage all the club's operations. The results show that the method works to improve how the club works and how involved its members are.

Making it easy for members to sign up has been made easy by the CoSA Club Management System all term. With no more paper forms to fill out and an easy-to-use online registration system,

it's now very easy for new people to join the club. The number of members has grown significantly because it is now very easy for more students in the Diploma in Computer Science program to sign up. The system's ability to collect specific information about members has also given CoSA useful information about member demographics and tastes. This has helped the organization make its activities and events more relevant to its members' interests. Overall, the method has made the club easier to get into, more open to everyone, and more fun.

In addition, the system has made it much easier to manage CoSA's operations. This has made it easier and faster for the club to run workshops, seminars, and other events by automating event planning and registration. Because the system can keep track of event information like venues, dates, and responsible people, mistakes and missed opportunities have gone down. Better event management has made programs run more smoothly and more successful. In turn, these well-run events have made members more involved and happier, which has made the Computer Science Club at UiTM Sabah livelier and busier. Finally, the CoSA Club Management System's results for a semester make it clear that it can improve member engagement and make club activities run more smoothly, creating a more active and productive club environment.

3. CONCLUSION

The CoSA Club Management System, created through the ADDIE model, has brought substantial improvements to member registration and activity management for UiTM Sabah's Diploma in Computer Science students. It has streamlined processes, enhancing engagement and satisfaction.

To further enhance the system, transitioning to a web-based platform is the next step, ensuring broader accessibility. Continuous refinements and additional features will keep the system aligned with evolving needs and expectations, making it a dynamic tool for a more vibrant and efficiently managed club environment.

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ECO SMART BACKPACK

Aliyah Syafiya Abdul Rahman, Nur Adila Mansor, Siti Zuhairah Hazwani Zulkifli, Nur Syuhada Norizan, Fadhilah Zainal Abidin, Noordiana Sukur*

Universiti Teknologi MARA, Cawangan Melaka, Kampus Bandaraya Melaka

dianasukur@uitm.edu.my

ABSTRACT

The backpack is a perfect travel companion for any journey because it is designed to replace all other luggage, which is frequently used by hikers, casual travellers and backpackers. Backpack is very necessary when traveling because it can make it easier and lighter for traveller to carry their belongings. However, there are some common backpacking problems; from unexpected weather conditions and equipment failures to navigation issues and safety concerns. Therefore, a product named Eco Smart Backpack was created to solve these problems. Furthermore, by integrating the recycle concept into this product, it is not only benefitting traveller but also the environment. In the long term, this product indirectly enables us to support a circular economy and minimise waste and landfill building. The objective of Eco Smart Backpack is to create a multi-function backpack from recycle materials and household items that assist traveller during their trips. In the process, several additional parts have been added to the used backpack. Every component has a distinct purpose; the pocketed GPS tracker, a safety whistle, a one-step poncho, a hiking stick and a used backpack. The ideal consumers for this Eco Smart Backpack are travellers, outdoor enthusiasts, novice hikers, and backpackers. We hope that this innovation product also helps us to protect our environment by recycling the used materials for a new purpose.

Keywords: backpack, recycle, GPS tracker, safety whistle, poncho, hiking stick

1. INTRODUCTION

A backpack is very necessary when traveling because it can make it easier and lighter for tourists to carry their belongings such as clothes, shoes and other equipment. According to Dillon (2023) this backpack is great as a travel companion for any trip, it is ultimately made to replace all of your other luggage. Backpacks are often used by backpackers, casual hikers and travellers for different needs and purposes.

However, it is difficult to find multifunction backpacks that work for a range of situations, so users would typically buy several to cover all of their needs (Jonsson, 2018). This further leads to overconsumption, and the product produced from unsustainable material, manufacturing, and processing choices will increase environmental impact (Jonsson, 2018). It was reported that, mmore than 1 billion umbrellas were discarded each year (Umbrella, 2023). Concern with environmental impacts, one of the components of this Eco Smart Backpack is made from the used umbrellas. The used umbrellas were recycled into poncho raincoat. Hence, this innovation aims to propose multifunction backpack that suitable for leisure traveller and beginner hiker that integrated with the concept of environmental sustainability.

2. LITERATURE REVIEW

2.1 Backpack

Backpacks have been quite popular for a long time since they allowed customers to carry items with their hands free (Ray, Puntabeekar, & Singh, 2020). Since it first designed in 1877 for the U.S military, it was evolved and innovated to fulfil certain needs and requirements (Ray et al., 2020).

According to Eagle, Z. (2016), backpacks were grouped into two categories: general use backpacks and special application backpacks. General use backpacks are designed daily use activities such as a school bag, a day-trip bag, or a supplemental bag while special application backpacks are designed to cater specific purposes such as recreational backpacks, travel backpacks or military backpack (Eagle, 2016)

2.2 Recycling

Recycling includes activities that unwanted/or waste materials are reused for the reproduction of new products - the unwanted materials can be plastics, metals, papers etc (Mwanza, 2021). Recycling is part of the components in the Waste Pyramid Hierarchy - Reduce, Reuse, and Recycle (Brin, 2023, NSW EPA, 2022).

3. METHODOLOGY

3.1 Materials

There are 6 main items used for the innovation of Eco Smart Backpack (Figure 1.0). The list of the items as per below;

- A medium sized hiking bag made from oxford material, with a strong wear resistance, and water repellent quality is selected.
- A plastic GPS pocketed used to provide information about a person's whereabouts.
- Metal safety was chosen because metal material is durable and not easily damaged.
- Five recycled polyester umbrellas were suitable for making the poncho. Polyester is a waterproof material that use for daily purposes.

Figure 1: Items and materials use for the innovation of Eco Smart Backpack

3.2 Product making process

The first design sketch started with a reference made from a jacket design by Knoblauch in 2022 (Figure 2). It was determined from the study that every human will naturally reach out both of their hands to cover their head during rainfall and to shelter from heat or cold.

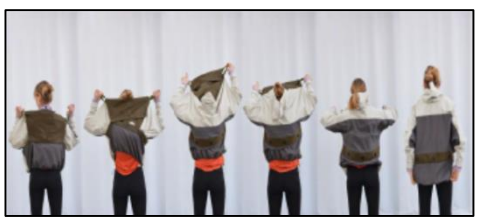

Figure 2. Weather wear jacket design by Knoblauch in 2022

A miniature replica was created from an A5 notebook paper. Then, the design transferred to a real-life scale on mahjong papers and sellotape, then changes were made due to some technical issues (Figure 3).

Figure 3. A life sized replica made from mahjong papers and Sellotape.

The changes are mostly on the application of the poncho's handle, to make it more user friendly. Then, the process of preparing a prototype started with placing the order for a mini-sized GPS (Figure 4), a metal safety whistle and a backpack suitable for travellers and casual hikers (Figure 5).

Figure 4. GPS tracker pocket

Figure 5. Detachable safety whistle

Following that, used umbrellas from different colours and size were collected from friends and families. The seams of the used umbrella were carefully removed, followed by transferring the sewing pattern onto the fabric. In an effort to make use of every part of the umbrella, a hiking stick from the umbrella's rod was included in the design for the hiking stick. Afterward, the fabric is cut to size for the whistle holder, GPS pocket and the poncho. The cut-up fabric was then meticulously sewn together using a home sewing machine and cotton threads (Figure 6). With a few more testing and improvements to the product, Smart backpack was born (Figure 7).

Figure 6. One step poncho

Figure 7.Eco Smart Backpack final design

4. RESULTS & DISCUSSION

4.1 Commercialization

This product will be marketed through trustworthy e-commerce shopping sites such as Shopee, TikTok shop, Lazada, Instagram market and Facebook shop. It will be easily promoted through the platform itself, for example the Shopee live session, TikTok live and for you page, Instagram feed and

advertisements and Facebook feed. After Covid19 outbreak, people have become used to shopping online and prefer to shop on social media platforms compared to shopping in stores.

This Eco Smart Backpack has a potential to be successful in the market for having a GPS tracker, poncho raincoat, and a whistle. Eco Smart Backpack will be the best choice for those who cares for their safety as well as supporting a greener future. This Eco Smart Backpack comes with the necessary equipment when hiking such as hiking stick, a one-step poncho, also known as a raincoat placed on the top of the bag can be used when it rains, the whistle on the side of the bag can be used in case of an emergency and the pocketed GPS tracker inside the bag also works if there is emergency. Hence, the target markets for this product are; leisure traveller, casual hiker or beginner hikers and outdoor recreationists.

4.2 Market review

Table 1 summarised the respondents' feedbacks on Eco Smart Backpack innovation idea. From the table, in general the idea and design were acceptable by majority of the respondents. However, there were also a few suggestions on what and how to improve the Eco Smart Backpack prototype. For example, the open-ended questions asked about "what important features can we put on this product?". 23.1% suggested flashlight. While for this question "what do you think about the smart backpack design?". 38.5% stated that the product is good, while another 23.1 % responded that this is an interesting product

Table 1: Respondents feedback on Eco Smart Backpack

Questions	Responses		Total responses
	Yes (%)	No (%)	N
Is RM60 suitable for this product?	12	1	13
Is our product useful	13	0	13
Do you want to recommend this product to others?	13	0	13
Do you think the detachable tracker is suitable for this product?	13	0	13
Do we need to improve this product?	8	5	13

5. CONCLUSION & RECOMMENDATION

In conclusion, the innovation of Eco Smart Backpack help businesses to create new products and services, improve existing products and services, reduce costs and protect the environment by recycling the used material to reproduced the new product. In the future, the product should upgraded in terms of its design, colour and materials.

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ANTIOXIDANT PROPERTIES OF TURMERIC RHIZOME AND LEAF (*CURCUMA LONGA. L)* AND ITS EFFECTS ON THE OXIDATIVE STABILITY OF BEEF PATTY

Fatimah Zahrah Darmadi[1], Marina Zulkifli[2] and Nina Naquiah Ahmad Nizar*[1]

[1]Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM), Cawangan Negeri Sembilan, Kampus Kuala Pilah, 72000 Kuala Pilah, Negeri Sembilan, Malaysia, [2]Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM), Shah Alam, 40450 Shah Alam, Selangor, Malaysia

naquiah@uitm.edu.my

ABSTRACT

Beef patties are made from meat. Meat contains the most protein among all foods and contains essential amino acids required in human diet. Nonetheless, beef patties are susceptible to oxidative deterioration, which is the source of limitation in the quality of the beef patty. This is due to lipid oxidation that produces products such as ketones, alcohols, aldehydes, and other toxic compounds. These substances have an adverse effect on colour, texture, and flavour. Thus, this study will focus on the antioxidant incorporation of the turmeric rhizome and leaf into the beef patty. The antioxidant activity of turmeric rhizome extract (TRE) and turmeric leaf extract (TLE) was analysed using three different methods which are Free Radical Scavenging (DPPH), Ferric Reducing Antioxidant Power (FRAP) and Total Phenolic Compound (TPC). Peroxide Value (PV) was performed on the beef patty incorporated with turmeric rhizome extract. This study assessed the antioxidant characteristics of turmeric rhizome extract and turmeric leaves extract, and whether turmeric rhizome extract exhibited antioxidant properties when added to beef patties.

Key Words: Turmeric, rhizome, beef patty, lipid oxidation, antioxidant

1. INTRODUCTION

Meat and meat products are essential components of the human diet, providing high-quality protein and essential fatty acids. However, proper storage and conditions are crucial for the quality of meat products, such as beef patty. Lipid oxidation, a chemical reaction that breaks down lipids, can lead to deterioration and negatively impact the quality of meat and human health. Synthetic antioxidants like BHA and BHT are commonly used in the food industry to address fat stability issues. However, consumers are increasingly adopting natural raw materials and formulations due to increased health awareness. Lipid oxidation produces toxic compounds, such as ketones, alcohols, aldehydes, and other toxic compounds, which negatively impact colour, texture, and flavour. Turmeric and its leaves are often consumed, but few studies have been conducted on their antioxidant activity as food antioxidants. Therefore, it is crucial to study the antioxidant activities of turmeric rhizomes and leaves as a natural antioxidant to maximize their use in Malaysia. The quality deterioration caused by lipid oxidation significantly impacts consumers' preference and concern towards beef patty consumption.

2. METHODOLOGY

2.1. Sample Extraction

The study used water as a solvent for solvent extraction, following the method of Saleh et al. (2022). The powdered sample was extracted with 600 ml boiling water for 10 minutes, filtered, dried on a rotary evaporator, and then freeze-dried for three days. The yield of the extracts was recorded and stored at room temperature for further analysis. The percentage total extract yield was calculated.

2.2. Determination of Antioxidants Activity

Total Phenolic Compound (TPC) was done according to method described by Sukati & Khobjai (2019). The final blue colour solution formed was determined spectrophotometrically at 760 nm. Triplicate and average were performed. Free Radical Scavenging Assay (DPPH) analysis was done according to Sukati & Khobjai, (2019) while Ferric Reducing Antioxidant Power (FRAP) was done according to Vijayalakshmi & Ruckmani, (2016).

2.3 Beef patty production

A meat grinder was used to grind fresh meat, dividing it into two batches for analysis. The beef patties were made in a food processing laboratory using a recipe of 250g lean beef meat, 5g salt, 10g white pepper, and 5g sugar. Turmeric rhizome extract was mixed into the mixture, keeping the temperature below 10^{o}C. The patties were prepared using a hand-held patty maker and stored at 4^{o}C for lipid oxidation analysis. The patties were measured three days apart for nine days, and their Peroxide Value (PV) was analysed for each day.

2.4 Determination of oxidative stability of beef patty

2.4.1 Lipid Extraction

This method was in accordance with Ortuño *et al*. (2021) method for lipid extraction in beef patty, which involves extracting the lipid portion using a chloroform: methanol solution. The organic phase is separated and dried, and the fat content is determined gravimetrically using the peroxide value method.

2.4.2 Peroxide Value (PV)

This analysis was performed according to the method done by Alhendi *et al.* (2017), with some modification. Approximately 3.0 ml beef patty extract was added into a clean and dry conical flask. Then a 30 mL solvent mixture (glacial acetic acid: Chloroform, 3:2) was added into the sample. The conical flask was shaken vigorously for less than 30 seconds. Then, 1.5 mL of saturated potassium iodide solution was added into the conical flask and let it stand for 1 minute. Next, 30 mL distilled water was added and followed by the addition of 1 ml starch indicator. The content inside the conical flask was then titrated with 0.01 M sodium thiosulphate solution. Simultaneously, the blank solution was determined.

3. RESULT & DISCUSSION

3.1 Extraction Yield

Extraction yield was determined as shown in Table 1.

Table 1: Total % Yield Extract of Turmeric Rhizome and Turmeric Leaf Sample

Sample	% of yield extract
Turmeric rhizome (TR)	7.49±0.15[a]
Turmeric leaf (TL)	5.28±0.11[b]

3.2 Determination of antioxidant activity

3.2.1 Total Phenolic Compound (TPC)

The study analysed the total phenolic content (TPC) of turmeric rhizome (TRE) and leaf extract (TLE) using a linear regression model. The results showed that TRE had a higher phenolic content (1.03±0.044[a]) compared to TLE (0.33±0.01[b]). This contradicts Burman *et al* (2020) report, which suggested that the leaf extract of turmeric had a higher total phenolic content. The difference in TPC could be attributed to factors such as active compounds, solvent, extraction process, and geographical location of turmeric plant cultivation. The trend of TPC values is similar to Chan and Lim (2007) study, which found that both turmeric rhizome and leaf had higher TPC values. Sepahpour *et al*. (2018) also found that the TPC value of turmeric rhizome extracted with water was 3.8 ± 0.1 mg GAE/g.

Table 2: Total Phenolic Compound of Turmeric Extracts

Sample	mg GAE/ g
Turmeric leaf extract (TLE)	0.33±0.01[b]
Turmeric rhizome extract (TRE)	1.03±0.04[a]

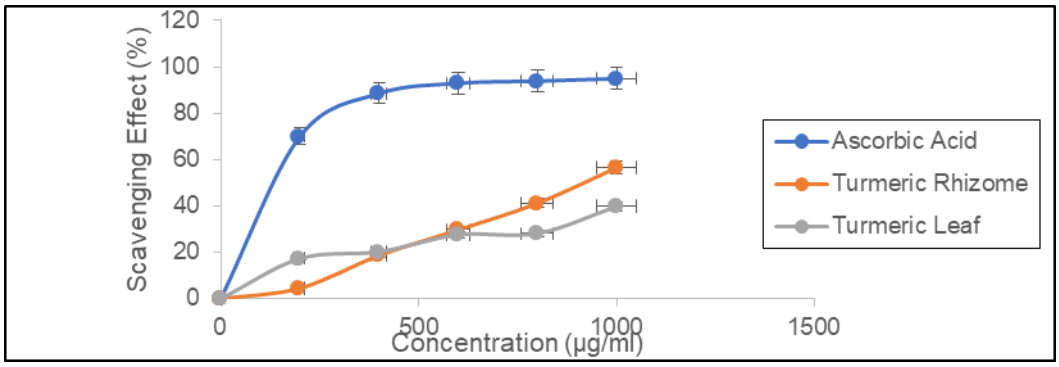

Figure 1: Scavenging Activity of Turmeric Rhizome and Turmeric Leaf

3.2.2 Free Radical Scavenging Assay (DPPH).

The scavenging effect of turmeric was measured at different concentrations, including 200, 400, 600, 800, and 1000 µg/ml. The DPPH scavenging effect of water extracts and standard was found to be 94.93%, 56.53%, and 39.87% at 1000 µg/ml. Ascorbic acid standard had the highest scavenging effect. TLE showed greater free radical scavenging activity at low concentrations. The scavenging effect of both samples was considered poor. Studies have reported high inhibition percentages for turmeric extract, with 83.89% at 500 µg/ml. However, the inhibition percentage of turmeric leaf was only 29.73% at 600 µg/ml.

3.2.3 Ferric Reducing Antioxidant Power (FRAP)

Turmeric, a plant with high antioxidant activity, exhibits a higher absorbance value than its leaves. The reducing power of turmeric samples, as indicated by the graph in Figure 2, increases with the concentration. The highest concentration (1000 µg/ml) is achieved with turmeric rhizome (2.283), ascorbic acid (2.001), and turmeric leaf (0.993). However, a study by Erdoğan and Erbaş (2021) found a lower absorbance value at 1000 µg/ml

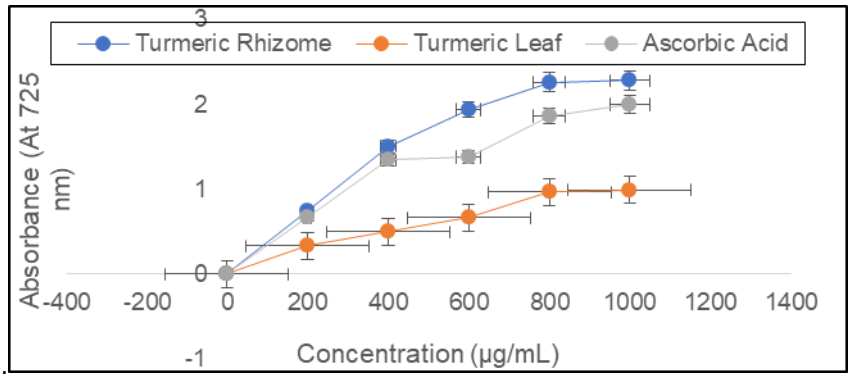

Figure 2: Ferric Reducing Antioxidant Power of Turmeric Rhizome and Turmeric Leaf Extract

3.3 Determination of oxidative stability of beef patty

3.3.1 Peroxide Value (PV)

The study found a significant difference in peroxide values of beef patty samples incorporating antioxidants compared to the control. The peroxide value increased proportionally with storage period, with the highest value observed on the last day. The same trend shown in the study of Sadeghinejad *et al*. (2019), which indicated that, during the entire chilled storage period, 4°C (excluding day 0), patties containing 500, 750, and 1000 mg/kg lyophilized pistachio green hull (LPGH) extract had significantly smaller peroxide values than the control. No significant difference was observed for TRE or ascorbic acid in the control beef patty, indicating a correlation between storage period and peroxide value.

Table 3: Peroxide Value of Beef Patty after 9 Days of Chilled Storage

	Interval			
	Day 0	**Day 3**	**Day 6**	**Day 9**
Control	2.56 ± 0.19^{Ca}	4.56 ± 1.07^{Ba}	5.33 ± 0.33^{Ba}	7.56 ± 0.51^{Aa}
Turmeric rhizome extract (TRE)	2.22 ± 0.19^{Cab}	2.73 ± 0.19^{Cb}	4.11 ± 0.69^{Bb}	6.33 ± 0.33^{Ab}
Ascorbic acid	1.89 ± 0.38^{Bb}	1.99 ± 0.33^{Bb}	2.56 ± 0.38^{Bc}	5.89 ± 0.77^{Ab}

Means within the column with same small letters are not significantly different (p>0.05),
Means within the row with same capital letters are not significantly different (p>0.05).

4. CONCLUSION & RECOMMENDATION

Turmeric rhizome, a natural antioxidant, has been found to reduce lipid oxidation in beef patty, according to three antioxidant assays: TPC, DPPH, and FRAP. The lower peroxide value of beef patty incorporated with turmeric rhizome extract (TRE) compared to the control patty without extract, but TRE had a higher peroxide value than ascorbic acid. Future studies should consider collecting turmeric samples from different locations, applying different extraction methods, and conducting

additional lipid oxidation analysis. Despite these findings, further research is needed to optimize the use of TRE in beef patty preservation.

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MOTORCYCLE DOLLY MOVER VERSION 2 (MDM2)

Suhaimi Nayan[1], Surina Nayan[2], Amir Shauqee Abdul Rahman[3], Nurul Izzati Mohamad Fazli[4], Abdul Qayyum Ahmad Fuad[5] and Muhammad Firhan Mohd Tamizi[6]

[1,3,4,5,6]UniKL MSI, [2] UiTM Cawangan Perlis

surinana@uitm.edu.my

ABSTRACT

The Motorcycle Dolly Mover project (MDM2) is an improvement project from an existing product which is available in the market. “Dolly” means a small platform on wheels which is used to carry heavy objects. Motorcycle dolly is one of the most often used support equipment to move motorcycles. This project (MDM 2) is devoted to every motorcycle enthusiast who wants to work around his/her bike, especially in confined spaces. Thus, a decent dolly is needed to help him/her to easily move his/her motorcycle. The main objective of the project is to improve the current project and overcome its weaknesses. The current available dolly mover in the market is bulky and heavy. Thus, making it difficult for the user to carry it anywhere he/she goes especially women. In addition, its design and size are not suitable for people with weak hand muscles, as it requires a lot of energy to lift the motorcycle onto the dolly. In addition, the current dolly is not equipped with a security system in case of theft. As a result, MDM2 is introduced to improve the current available dolly in the market. The new dolly, MDM2 is more user friendly and comfortable as it is light and not bulky. As a result, it is suitable for people with weak hand muscles and women. For theft prevention, it has a security function that can alert the owner when someone tries to move the motorcycle. Finally, it is also capable of withstanding any motorcycle loads of up to 400kg.

Key Words: Dolly, Motorcycle Dolly, Prevent Theft, Motorcycle Loads, Dolly Mover

1. INTRODUCTION

A dolly is “A dolly is a cart with wheels and a long handle used for moving heavy objects,” (https://www.vocabulary.com/dictionary/dolly). There are different types of dollies available in the market. For example, utility dolly, appliance dolly, hand truck dolly and furniture dolly (https://www.commander.ca/what-is-the-difference-between-a-hand-truck-and-a-dolly/). The type of dolly purchased depends on consumers’ need to help ease their work. As for this project, the aim is to help motorcycles enthusiasts to move their motorcycles regardless of their sizes easily especially in confined spaces. In general, many riders have difficulties moving their motorcycles with the old dolly mover that is bulky and heavy and this requires lots of energy. Thus, it poses challenges especially women riders to use it. In addition, A lot of time must be spent adjusting and enhancing motorcycles, which is common among motorcycle enthusiasts. By using the bike's own stand, which has historically been done by amateurs, this can be risky due to the stand's instability (Foley, Sigurðsson, Guðmundur & Ólafsson, Ólafur (2017). Thus, by introducing MDM2 is it hoped that women riders and other riders with weak hand muscles can easily move their motorcycles in any parking spaces that is narrow as MDM2 requires less energy to be operated. MDM2 is light, not bulky and can easily be operated.

2. PROJECT SCOPE

The project scope is to study the weaknesses of old dolly products in order to improve the product in the future so that it will be easier for users to use it. The improvement made to the current available dolly is by redesigning the product to be more effective.

3. OBJECTIVES

The objectives of the innovation are:

i. To improve the current dolly mover
ii. To facilitate dolly users in handling their motorcycles
iii. To produce a simple and light weight dolly
iv. To enhance its security function

4. FLOW CHART OF DESIGN PROCESS

The following pictures depict the processes involved in designing MDM 2

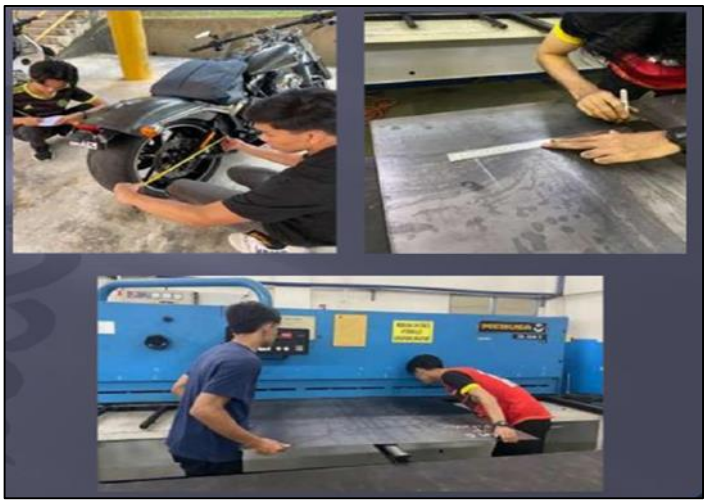

Figure 1. Measuring, marking and cutting process

Figure 2. Fabrication process.

Figure 3. Assembly and finishing process.

6. FINDINGS

Figure 6.2 below depicts the result of improving an old product to a more effective product in terms of usability and user comfort. The results of our research found that the function of the 'motorcycle dolly mover' is for the back tire of motorcycle because it cannot go left or right. By that, we have created a simpler and user-friendly design. In addition, we have added a security system by using a vibrationally triggered alarm sensor to detect if there is an attempted theft.

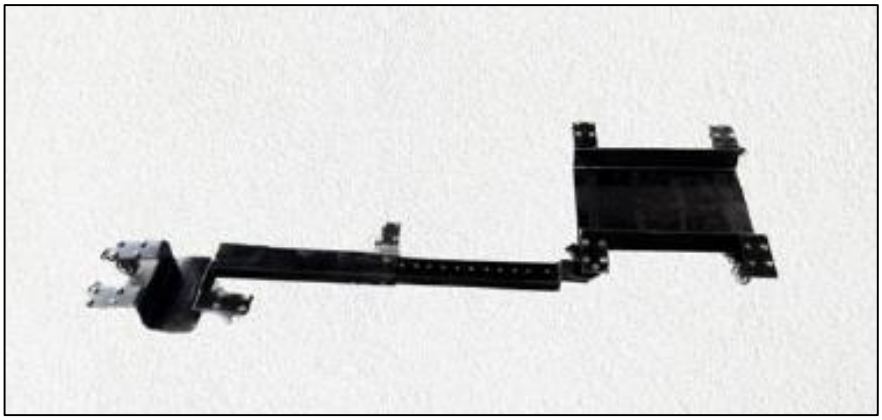

Figure 4. Current dolly MDM2

7. CONCLUSION

Motorcycle dolly mover is described as highly effective, adjustable, and easy to use. In addition, it is hoped that it can be sold to those who have difficulty transforming and parking large motorcycles. This dolly motorcycle has more advantages than ever before. An easy-to-carry design and lighter than before, it is capable of withstanding motorcycle loads of up to 400kg. This dolly motorcycle can also improve motorcycle safety with the availability of security alarms. This dolly motorcycle also provides many advantages in terms of low manpower consumption. Dolly cannot be used on all types of motorcycles, but this Dolly Mover motorcycle can be used by all types of motorcycles.

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ENHANCING SUSTAINABILITY IN THE MBSJ COMMUNITY GARDEN THROUGH INNOVATIVE INTEGRATION OF AN UNDERGROUND WATER TANK SYSTEM

Adnan Derahman[1], Noorfaizah Hamzah[1],
Nur'Ain Mat Yusof[2], Muhamad Fuad Shukor[3]

School of Civil Engineering, College of Engineering, Universiti Teknologi MARA, Shah Alam, Selangor
Civil Engineering Studies, College of Engineering, Universiti Teknologi MARA, Pahang Branch, Pahang
Civil Engineering Studies, College of Engineering, Universiti Teknologi MARA, Pasir Gudang Branch, Johor

noorfaizah1209@uitm.edu.my, nurainyusof@uitm.edu.my

ABSTRACT

The primary and crucial resource for plant growth, alongside sunlight, is water. While sunlight is generally abundant, the availability of water can be disrupted, especially in Selangor, due to droughts or contamination affecting water treatment plants. To address this issue, an effective alternative method for sourcing water is through an Innovative Underground Water Tank System known as Tube Wells. Unlike traditional wells commonly found in rural areas, Tube Wells tap into Confined Aquifers deep underground, where water of high quality is accessed and remains unaffected by droughts or pollution. Hence, meticulous planning and subsurface soil investigation using Electrical Resistivity Imaging (ERI) for Geomap Survey are essential for locating and determining the position of these Confined Aquifers. The Tube Well system enables access to groundwater at depths ranging from 10 meters to several hundred meters, depending on specific site conditions. The concept of community gardens, under the purview of Majlis Bandaraya Subang Jaya (MBSJ), promotes local plant-based activities by fostering community-based agriculture that also contributes to economic development. In addition to serving as a local food source and supporting agriculture, community gardens contribute to green spaces and enhance the aesthetics of urban environments. The inaugural community garden project was launched at Garnet Apartments on October 3, 2013. Over time, the number of community gardens in MBSJ has grown to encompass 69 areas. To facilitate the development of these gardens, geological scanning and Geomap Survey activities are conducted at proposed garden locations. These surveys provide valuable insights into the sub-surface soil layers, aiding in garden planning and development. The use of a Boring Machine for the Tube Well project requires suitable access to ensure the machine reaches the desired location effectively. It is recommended to create a 6-inch diameter pipe hole using a 1 Horsepower (1HP, equivalent to 0. 75 kW) Submersible Water Pump, capable of pumping 3,600 liters per hour (3.6 cubic meters per hour). Notably, the electrical consumption during pump operation is minimal, with a power rating of only 750 Watts or 0.75 kW. To track and manage water usage from the Tube Wells, water meters will be installed, further enhancing sustainability within the MBSJ Community Garden initiative.

Key Words: Tube Wells Innovation, Community Gardens, Confined Aquifers, Electrical Resistivity Imaging, Water Sustainability

1. INTRODUCTION

Besides sunshine, water is the most essential fundamental source for plants. Water resources, particularly in the state of Selangor, are constantly disturbed, whether because of the rainy season or water pollution that is identified by water treatment facilities. While it can be argued that sunlight is always present, water resources are not. The Tube Bay system (Tube Well) is, in this sense, the finest alternative approach for obtaining water resources. It differs from the well frequently found in communities in that the water for well comes from the Unconfined Aquifer, whereas the water for tube wells comes from the Confined Aquifer located deep within the earth and is pumped out for various purposes, as illustrated in Figure 1.

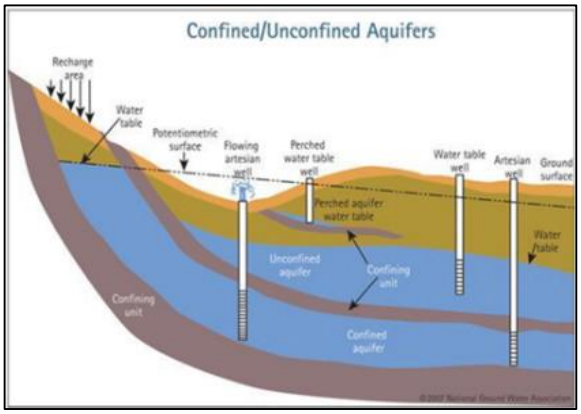

Figure 1. Confined Aquifer and Unconfined Aquifer

The Confined Aquifer is a reliable source of high-quality water that is not harmed by wet weather or pollution problems. Therefore, it is crucial to conduct an underground soil research and plan carefully, which led to the creation of the Geomap Survey. Predicting locations and locations of encased aquifers requires the use of Electrical Resistivity Imaging (ERI) to create a Geomap Survey (Confined Aquifer). Depending on the location of a given site, it can be hundreds of meters beneath the surface of the earth.

1.1. Background of Study

In response to the critical challenges faced by Selangor, where water scarcity and contamination threaten plant growth and local communities, a comprehensive study has been initiated. The primary objective is to promote community-based agriculture, stimulating economic development and regional crop production through initiatives like community gardens. These green spaces not only enhance food production but also beautify urban areas. This endeavour aligns with key Sustainable Development Goals (SDGs), including combating hunger (SDG2), addressing water and sanitation issues (SDG6), promoting innovation and infrastructure (SDG9), creating sustainable cities and communities (SDG11), and taking action on climate change (SDG13). To ensure success, the project seeks support from stakeholders like Ar. Kamarul Hisham bin Yeop Hashim and has chosen the USJ 3/4 Community Garden as its focal point. Moreover, it aims to inspire other community gardens across different sites in Selangor, fostering sustainable agriculture and green urban environments. This study, rooted in the importance of water resources, agriculture, and SDGs, has the potential to transform Selangor by addressing water challenges, promoting economic growth, sustainable communities, and a greener, more appealing urban landscape.

2. METHODOLOGY

Geological scanning or geo-map survey work at the proposed plantation site is essential to obtain an initial overview of the sub-surface soil layers. Figure 2 illustrates a sample image of the geological scanning or geo-map survey work being conducted by the research team. The machinery or Boring Machine utilized for the Tube Well project is depicted in Figure 3. Adequate access is necessary to ensure that the machine can reach the desired location.

Figure 2. Sub-surface soil layers can be identified early on using a geological scan or geomap

Figure 3. Boring Machine

Besides that, 12 tons of trucks were used to convey the drilling rig, a compressor, a crawler box, and drilling equipment. The drilling rig weighed 2.6 tons. In the video below, both High Performance Tube Well Technique and Low Performance Tubewell Technique are demonstrated. One horsepower submersible water pumps with drill holes of 6" and 8" in diameter are used. One horsepower is comparable to 0.75 kW. It has a maximum water pumping capacity of 3600 liters per hour (3.6 cubic meters per hour). Using a fibre optic camera with a maximum depth of 656 feet, the depth of object is measured. Other than that, pumping only uses 750 watts, or 0.75 kW, of electricity, hence it consumes relatively little electricity. Additionally, a water meter will be put in place to track how much water is consumed through each pipe.

3. PROJECT OUTCOMES

From this project, the tube well system enables access to groundwater at depths ranging from 10 meters to several hundred meters, depending on specific site conditions. Figure 4 below indicates pictorial summary of the overall project with the description of geo-material and depth of coring.

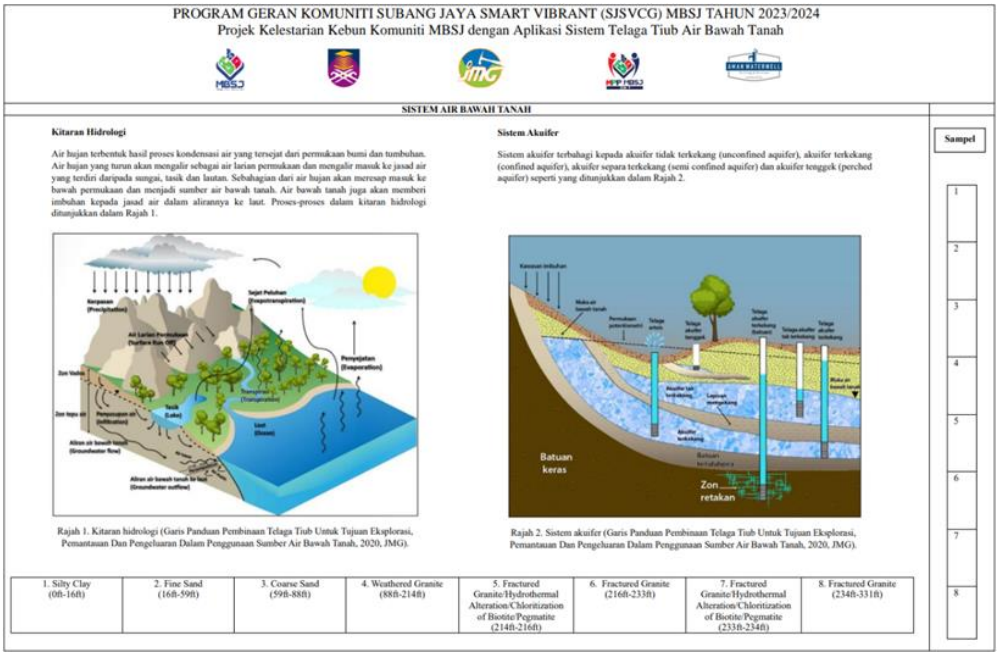

Figure 4. Summary of the overall project with the description of geo material and depth of coring

4. DISCUSSION

The Majlis Bandaraya Subang Jaya (MBSJ) idea of community gardens encourages local plant-based activities by supporting community-based agriculture, which also contributes to economic growth. Community gardens contribute to green spaces and improve the aesthetics of urban surroundings, in addition to providing as a local food supply and supporting agriculture. On October 3, 2013, the first community garden initiative was established at Garnet Apartments. The number of community gardens in MBSJ has increased over time to 69. Geological scanning and Geomap Survey operations are carried out at potential garden locations to aid in the building of these gardens. These studies give useful information on the subsurface soil layers, which aids in garden design and growth.

5. CONCLUSION

This project offers a free watering system for community gardens, potentially serving as a local water reserve during water contamination emergencies. It has the potential for expansion to more locations upon request. The Chief Investigator has initiated discussions with Selangor Water Management Quality (LUAS) to seek fee exemptions based on the project's limited use and purpose. As the irrigation water used is efficiently returned to the soil system and drawn from the Confined Aquifer zone, the project has no adverse neighborhood effects. The project is meticulously supervised by experts in geology, hydrogeology, geotechnical engineering, and soil engineering from UiTM and JMG, ensuring its responsible execution.

6. RECOMMMENDATION

Given the evident benefits experienced by the local community in the project area, it is highly recommended to consider the expansion and implementation of this project in another district. The success of this endeavour in providing free watering for community gardens, serving as a potential local water reserve during emergencies, and fostering responsible water resource management is a strong indicator of its positive impact. By extending this project to a different district, the advantages it brings, such as supporting local agriculture, enhancing water resilience, and community engagement,

can be replicated and further contribute to sustainable development and well-being in new areas. This not only leverages the success of the existing project but also aligns with the broader goal of addressing water-related challenges and fostering community-based agriculture in a more extensive geographical context.

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PENDANG'S MIND SPARKHUB

Mohamad Naziem Azimi Bin Mohamad Khalil

Universiti Teknologi Mara Cawangan Selangor, Kampus Puncak Alam

2023135982@student.uitm.edu.my

ABSTRACT

Pendang's Mind SparkHub concept introduces a new approach to education and recreation in community parks. This study aims to explore the integration of educational parks into the community. In addressing the existing challenges of the lack of information dissemination, the absence of comprehensive information about the park landscape and the failure to harness the use of innovative ideas for young people. The sentiment of this issue is recognized as a critical issue. Furthermore, the lack of educational initiatives in recreational areas highlights gaps in community development. This study identified effective methods to disseminate information and attract visitors. This study also investigates the latest innovative technologies that can be integrated into an educational park, leveraging efficient ICT tools to attract the interest of the modern generation by using the Mind SparkHub concept, which emphasizes a dynamic and engaging educational approach, as the basis for a recreational park. This approach aims to bridge the gap between entertainment and learning. This research uses an approach that involves various fields such as education, technology, and community development. By coordinating the existing elements, this study aims to propose a comprehensive framework for the development of Pendang's Mind SparkHub. The findings of this research provide insight into the potential transformation of conventional recreational spaces into hubs of education, creativity and innovation. Finally, the integration of educational elements into the community garden has the potential to increase the encouragement of users from children to adults in addition to fostering a culture of continuous learning in the community.

Key Words: Pendang's Mind SparkHub, recreation park, innovative, entertainment, education

1. INTRODUCTION

In the current era, there is the construction of public recreational parks that have landscape elements that do not contribute to educational services. The purpose of this study is to examine the needs of landscape elements and information that can provide educational services to the local community. This study was conducted based on three problems, one of which is that landscape elements do not have information or information about a landscape and there is no innovative use of technology to deliver information. The method of this study is conducted with random sampling, which is to distribute questionnaires to 50 respondents as visitors to obtain the level of respondents' agreement with the 5 elements proposed. The results show that as many as 4 elements of the proposal are used as informative elements with the support of high respondents. Meanwhile, there is one element of the proposal that was dissolved due to low respondents. This is that the proposed elements do not meet the criteria and lack of information presented. Based on the data, a proposal and innovation was found to create an informative recreation park that can channel educational services to the community. In conclusion, the proposal is to solve the problem of the current state of the recreational park area in Taman Tasik Pendang Town.

2. LITERATURE REVIEW

The introduction of Pendang Mind SparkHub represents a groundbreaking and innovative approach aimed at enriching the knowledge of the community frequenting Taman Rekrasi Pendang. This proposal strives to offer a dynamic and informative experience to park visitors as they engage in recreational activities. The essence of Pendang Mind SparkHub lies in providing comprehensive insights into the various elements of the park's landscape, effectively marrying recreation with education. To achieve this, the proposal suggests the integration of informative brochures at designated checkpoints near these natural elements. These brochures will feature captivating 3D maps and animations, complete with QR codes providing access to invaluable information and interactive quizzes. This forward-thinking initiative aims to captivate the community's interest, enticing them to explore the recreational park while simultaneously acquiring knowledge about each natural element. In essence, Pendang Mind SparkHub aspires to cultivate a generation with a profound love for reading and a strong aptitude for learning.

Pendang Mind SparkHub leverages modern technology and design to transform the conventional recreational experience. By introducing engaging and educational brochures placed strategically near each noteworthy landscape element, visitors are encouraged to embark on an exploratory journey. The inclusion of 3D maps and animated content adds a visually stimulating and immersive dimension to the educational process, making it more accessible and appealing to individuals of all ages. The integration of QR codes facilitates instant access to detailed information and interactive quizzes, fostering a sense of interactivity and engagement.

Pendang Mind SparkHub aspires to achieve more than just the dissemination of information; it aims to cultivate a deeper appreciation for knowledge. By seamlessly blending education and recreation, the proposal endeavors to instill a love for reading and a thirst for learning in the hearts of park visitors. Through this initiative, visitors of all ages can gain a comprehensive understanding of the park's natural elements, sparking curiosity and encouraging further exploration.

Pendang Mind SparkHub is not just a recommendation; it is an invitation to change the way communities engage with their local recreational spaces. By incorporating educational elements into the heart of Pendang Recreation Park, this initiative aims to bridge the gap between leisure and learning, fostering a culture of curiosity and intellectual growth. The integration of modern technology, dynamic visuals and interactive content is sure to attract individuals of all ages to the park while fostering a generation that values knowledge and embraces the joy of discovery. Pendang Mind SparkHub represents a bold step towards creating a more informed, engaged and intellectually curious community.

3. OBJECTIVES

In order to achieve that goal, three objectives have been set, namely:

a) Identify landscape elements that provide educational benefits to the community;
b) Identify efficient and innovative methods in the park
c) Suggest Pendang Mind SparkHub Info in the form of a brochure

4. METHODOLOGY

This study is descriptive in nature to identify the level of knowledge required for each element contained in this Recreation Park. Quantitative data was collected through a questionnaire that was sent to visitors who came to get their comments and opinions on the recommendations implemented in the park.

The use of a likert scale with a scale of [1]”Strongly Disagree”, [2]”Disagree”, [3]”Uncertain”, [4]”Agree”, [5]”Strongly Agree” to describe the views of element statement requirements informative landscape in the area.

5. OUTPUT OF PRODUCT

This study is a new proposal in providing information about the landscape found in Pendang Recreation Park. Through the innovation of QR Code generation that will be featured at each checkpoint near the element, the visiting community will be exposed to the information that will be delivered and can improve the level of education for the community. In addition, the impact of this innovation would be in terms of economy and also the attraction of foreign tourists.

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ANTIOXIDANT STUDY OF DIFFERENT PARTS OF STINK BEAN (*PARKIA SPECIOSA*) AND ITS EFFECT ON THE OXIDATIVE STABILITY OF BEEF PATTY

Nur Syahirah Yahaya[1], Nina Naquiah Ahmad Nizar[1], and Marina Zulkifli[2, *]

[1]Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM), Cawangan Negeri Sembilan, Kampus Kuala Pilah, 72000 Kuala Pilah, Negeri Sembilan, Malaysia,[2]Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM), 40450 Shah Alam, Selangor, Malaysia.

marina547@uitm.edu.my

ABSTRACT

This study investigated the potential of stink bean leaves and peels as natural antioxidants in meat products. The leaves and peels were extracted using water as a solvent. Antioxidant analysis that includes Total Phenolic Compound (TPC), Free Radical Scavenging Activity (DPPH) and Ferric Reducing Antioxidant Power (FRAP) assays were carried out to determine the total polyphenols and antioxidant activities in both extracts. TPC was determined using Follin-Ciocalteu reagent and the result indicated that TPC for peel extract was 37.51 mg GAE/g and 3.95 mg GAE/g for leaf extract. The antioxidant activities were compared with synthetic antioxidant which was ascorbic acid. For DPPH, scavenging effects of extracts and ascorbic acid decreased significantly in the order of ascorbic acid, peel extract, and leaf extract with the percentage of 94.93%, 93.64% and 90.35%, respectively at 1000 ppm. Meanwhile for FRAP assay, peel extract at 200 ppm and leaf extract at 800 ppm were comparable to 600 ppm of ascorbic acid. Thus, 200 ppm of peel extract was chosen to be incorporated into beef patty and be compared with ascorbic acid at 600 ppm. Oxidation analysis was performed on beef patties that were prepared using three formulas which were sample without the addition of extract (control), sample with ascorbic acid and sample with peel extract. Lipid oxidation analysis was performed by determining the peroxide value (PV) which varied from 5.89 to 7.56 meq/kg at the end of the storage. Hence, both parts of plants showed antioxidants properties, but peel extract was proven to possess higher antioxidant activity and has a potential to be incorporated into beef patty and as natural antioxidant.

Key Words: stink bean peels, stink bean leaves, antioxidant, beef patty, oxidative stability

1. INTRODUCTION

In food industry, antioxidants are crucial for extending food's shelf life, minimising nutritional losses, and reducing the production of toxic materials (Ko *et al.,* 2014). A study by Fithri *et al.* (2019) stated that stink bean seeds and leaves showed a strong antioxidant activity against the radical effect of superoxide with an approximately 70% inhibition rate. The natural antioxidants regularly consist of substances with numerous OH groups which act as hydrogen donors to retard the lipid oxidation (Mozuraityte *et al.,* 2016). Recently, the natural antioxidant has gained interest from the consumers especially in food industry as the synthetic antioxidant such as butylated hydroxyl anisole (BHA) usage has been linked to a potential toxicity with negative effect, including carcinogenesis (Caleja *et al.,* 2017). Some bakery, dairy, and meat products now incorporate natural extracts from aromatic plants, spices, and fruit powder for antioxidant purposes, hence enhancing the value of end products.

2. METHODOLOGY

2.1 Preparation of plant extract

The extraction of sample was done according to Nurdyansyah & Widyastuti (2020) with slight modifications. Twenty grams of stinky beans powder were extracted with 600 mL of boiling water. The sample was partitioned via filter paper and evaporated using rotary evaporator at 50°C to 60°C. The extracts then were freeze-dried in the freeze dryer until it fully dried into powder. The percentage of plant extracts for each weight of sample were determined.

2.2 Total phenolic compound (TPC)

The Total phenolic content (TPC) in the extracts were determined using Folin–Ciocalteu reagent according to Wonghirundecha (2014) with several modifications. Firstly, gallic acid standard was prepared by using the concentrations of 0.0, 5.0, 10.0 20.0, 30.0 and 50.0 µg. The solution was inserted into volumetric flask. The flask was mixed with about 0.5 ml of Folin-Ciocalteu reagent. After 3 minutes, 1.5 ml of 20% Na_2CO_3 were added, and the mixture was shaken. About 10 ml of distilled water was added to the mixture, and it was shaken again. The mixture was placed for 2 hours at room temperature and was analysed at 760 nm by UV-vis spectrophotometer. The TPC method was done by dissolving 10 mg of extract in 2 ml of distilled water. About 0.1 ml of the solution was mixed into 10 ml volumetric flask and 0.5 ml Folin-Ciocalteau reagent was added into the solution. After 3 minutes, 1.5 ml 20% Na_2CO_3 was added and shaken. Distilled water was added to the mixture about 10 ml and was shaken again. The mixture was placed for 2 hours at room temperature. The samples were then be read at 760 nm by UV-vis spectrophotometer.

2.3 Free radical scavenging activity (DPPH)

This DPPH assay was conducted according to Ghasemzadeh *et al.* (2018) with several modifications. For both extracts, the sample were prepared in different concentrations. About 0.6 ml of extract of each concentration were transferred to the test tubes. Then 4.5 ml of DPPH was added to every test tubes. Then it were shaken and mixed well. The samples were set in the dark for about half an hour at room temperature. The absorbance was read at 517 nm wavelength.

2.4 Free reducing antioxidant power (FRAP)

Using method performed by Vijayalakshmi & Ruckmani (2016), different concentrations of extracts were prepared in 1 ml distilled water. The solution was mixed with 5.0 ml phosphate buffer and 5 ml of 1% potassium ferricyanide. The mixture was incubated at 50°C for 20 minutes. Then, 5 ml of 10% trichloroacetic acid was added to the mixture and centrifuged at 3000 rpm for 10 minutes. Five ml from the upper layer were mixed with 5.0 ml distilled water and followed by 1.0 ml of 0.1% ferric chloride. Absorbance was read at 725 nm by using spectrophotometer.

2.5 Preparation of beef patty

A meat grinder was used to grind the fresh meat. The raw materials were mixed using a mixer includes 750 g lean beef meat, 130 mL iced water, 15g salt, 10g white pepper, and 5 g sugar. The extracts were added into respective parts of the patty's mixture. Then, around 70 g of beef patties were made and placed on a plastic tray. The patties were packed into a seal bag and stored in a chiller at 4°C. The patties were measured for Peroxide value (PV) within three days interval for nine days.

2.6 Lipid extraction

Lipids were extracted by using the chloroform–methanol as described by Holman *et al.* (2019). Ten g of samples were mixed with chloroform: methanol (1:2) and homogenised using homogeniser at 8000 rpm for two minutes. After that, 10 ml of chloroform was added and homogenised again around 30 seconds. Next, the mixture was mixed with 10 ml of distilled water and stirred until homogenous sample formed. Then, the sample was filtered and evaporated using rotary at 60^{o}C until constant weight gained.

2.7 Peroxide value (PV)

Peroxide value was conducted by using the method described in Teye *et al*. (2012) with a few changes. About 5 g beef patty was weighed and 30 mL solvent mixture (glacial acetic acid: Chloroform, 3:2) was added to the sample and shaken until dissolved. Next 1.5 mL saturated potassium iodide solution was added and let it stand for a minute. Then, 30 mL distilled water was added followed by 1 mL of starch indicator. Finally the mixture was titrated with 0.01 M sodium thiosulphate solution.

2.8 Statistical analysis

All data were reported as means and standard deviations. The gathered data was subjected to a one-way analysis of variance (ANOVA) and t-test to do the means comparison. SPSS was used to conduct the analysis. Then, $P > 0.05$ was used as the significance threshold for all comparisons.

3. RESULT AND DISCUSSION

3.1 Extraction Yield

Table 1: Percentage yield of stink bean peels and leaves extract

Sample	% of yield extract
Stink bean peels (SBP)	4.52±0.13^{a}
Stink bean leaf (SBL)	3.38±0.11^{b}

3.2 Total phenolic compound (TPC)

Table 2: Total phenolic content of stink bean peels and leaves extract

Sample	TPC (mg GAE/g extract weight)
Stink bean peels (SBP)	37.51±3.43^{a}
Stink bean leaf (SBL)	3.95±0.22^{b}

The content of TPC for stink bean peels and leaves extract were 37.51 mg GAE/g and 3.95 mg GAE/g, respectively with significant differences ($p<0.05$). This result indicated that the SBP extract has richer source of phenolic compounds than SBL extract.

3.3 Free radical scavenging activity (DPPH)

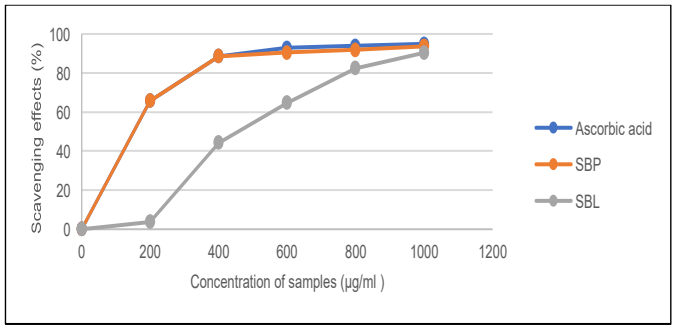

Figure 1. The scavenging activity of stink bean peels, leaves extract and ascorbic acid.

At 1000 ppm, the decreasing order in scavenging effect were observed as follows: Ascorbic acid (94.93%) > SBP (93.64%) > SBL (90.35%). At each concentration, SBP extract exhibited higher DPPH scavenging activity compared to SBL extract. This might be related to the TPC obtained in the result earlier whereby SBP extract with high in phenolic compounds increased in its antioxidant activity. A study from Nurdyansyah (2020) reported the scavenging effects of aqueous extract of SBP were 9.12%, 16.30%, 21.97%, 30.58% and 37.13% for concentrations of 20 ppm, 40 ppm, 60 ppm, 80 ppm and 100 ppm, respectively. However, the scientific literature provides limited information regarding the radical scavenging activity of SBL with water extract.

3.4 Ferric reducing antioxidant power (FRAP)

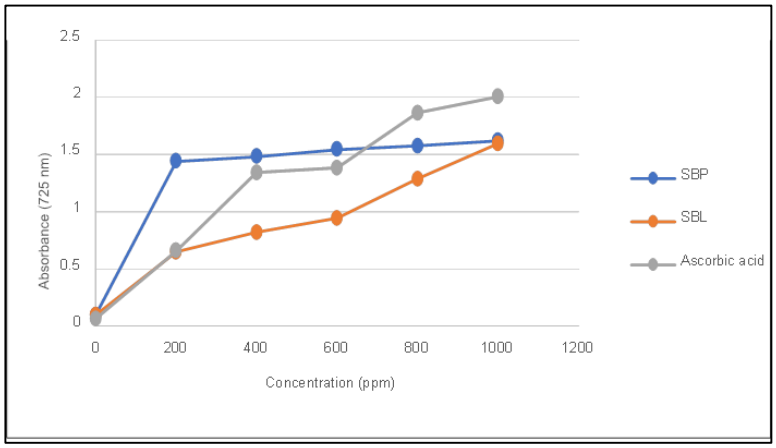

Figure 2. Ferric reducing antioxidant power of stink bean peel and leaf extracts with ascorbic acid

Increase in absorbance showed a reducing power of the samples. At 200 ppm, reducing power of samples decreased in the order: SBP > Ascorbic acid > SBL. However, at 1000 ppm, the reducing capability changed in order where: Ascorbic acid > SBP > SBL. SBP at 200 ppm with absorbance equal to 1.442 is comparable to 600 ppm of ascorbic acid. SBL extract needs to be in high concentration (800 ppm) to be able to obtain absorbance that is near to SBP and ascorbic acid, (1.288). Owing to the highest absorbance (indicating high antioxidant activity) at 200 ppm, SBP extract was chosen to be incorporated into beef patty.

3.5 Peroxide value (PV)

Table 3: The peroxide values of beef patties during nine days of storage

Storage (days)	Control	Ascorbic acid	SBP
0	2.56 ± 0.19[a]	1.89 ± 0.38[b]	2.44 ± 0.19[a]
3	4.89 ± 0.51[a]	2.00 ± 0.33[b]	2.56 ± 0.20[b]
6	5.33 ± 0.34[a]	2.55 ± 0.39[c]	4.11 ± 0.7[b]
9	7.56 ± 0.51[a]	5.89 ± 0.77[b]	6.22 ± 0.51[b]

At the end of the storage, the value varied from 5.89 to 7.56 meq/kg. PV was non-significant ($p>0.05$) at day zero, day three and the last day of chilled storage. The value only became significant ($p<0.05$) at day six between control and treated samples. However, in this study, PV for all formulations were below 10 meq/kg throughout nine days of storage. According to Ali *et al.* (2019), food product with peroxide value between 5 to 10 meq/kg is considered moderately oxidised, while above 10 meq/kg is considered highly oxidised.

4. CONCLUSION AND RECOMMENDATION

The study found that both parts of stink bean have antioxidant properties, with peel has higher antioxidant activity than leaf extract. The TPC of SBP extract was significantly higher than SBL extract, and it exhibited higher scavenging effects compared to SBL but slightly lower than ascorbic acid. SBP extract also had higher reduced power, leading to higher antioxidant activities compared to SBL extract. The SBP extract at 200 ppm was observed to act as an antioxidant against beef patty oxidation during nine days of chilled storage at 4°C. Therefore, it is suggested that SBP extract could be used in the food industry as an antioxidant. Additionally, further study on the application of different parts of stink bean extract into other food products should be conducted to observe more research about its effectiveness as natural antioxidant.

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MARC 2.0: TEACHING MALAYSIAN CULTURE THE FUN WAY

Sheela Paramasivam[1], Nur Fatima Aisya[2],Asha Ganesan [3], Afni Anida Adnan [4]

Universiti Teknologi MARA, Negeri Sembilan Branch, Seremban Campus,
Malaysia International Innovative College, Selangor., Malaysia
Monash University Malaysia, Malaysia Campus, Petaling Jaya, Malaysia

sheela@uitm.edu.my

ABSTRACT

The teaching of culture as a subject can be interesting and difficult at the same time, especially when it involves understanding another aspect of culture such as religion and customs besides one's own. Assessing students' knowledge and understanding in subjects such as culture is no easy task either. In the digital world today, there are many online assessment tools which can be used to facilitate teaching and learning. One such application is Quizizz, a game-based online quiz. The purpose of this research is to measure the effectiveness of *MARC 2.0* (acronym for Malaysian religion and customs), an online Quizizz game to teach culture and gauge students' knowledge and understanding of Malaysian culture. Descriptive questionnaire was used to obtain feedback after students played *MARC 2.0*, the quizizz game. Results of the survey indicated that students responded positively to the use of *MARC 2.0* as a quizizz game to learn and embrace Malaysian culture in a fun and interactive manner and to introduce the culture of Malaysia to any foreign or local students pursuing their studies in Malaysia. The inclusion of attractive visuals, a timer, correct answers as well as scores obtained using *MARC 2.0* motivated students to understand, learn and gain insights to the culture of Malaysia in a fun and engaging way. Additionally, MARC 2.0 could be installed in their handphones for convenience. In conclusion, it is important for teachers to consider using fun and entertaining technology to teach culture. *MARC 2.0* can be further explored and extended to include other aspects of Malaysian culture such as food, festivals, traditional songs, clothes and even taboos to tourists visiting Malaysia in the hope of introducing Malaysia as a land of beauty and diversity.

Keywords- online platform, culture, interactive

1. INTRODUCTION

The use of information communication technology (ICT) in education has seen tremendous growth in promoting e-learning (Devi & Astuti, 2021). This is also seen in the integration of many web-based games which has benefited both teachers and students in making teaching and learning more effective, fun and interesting. According to Callista and Hua (2021), this technological medium has not only helped increase students' motivation by providing autonomy for independent and self-learning but also by providing immediate feedback to assessments, questions, and tasks. In Malaysia, the most popular web-based games used for teaching and learning are Kahoot, Quizlet, Edupuzzle and Quizizz (Callista & Hua, 2021).

Online learning using various technological applications such as e-games, quizzes as well as mobile gadgets has seen a tremendous increase especially during the Covid19 pandemic for the years 2020-2022. Although online learning especially online distance learning has been widely used in various institutions, it has become even more prominent during the pandemic due to travel restrictions and exclusion of face-to-face learning. This has not only affected instructors worldwide

to make changes to the mode of delivery of content in their lessons but also the running of other general programmes such as orientation programmes for students who embark on their designated programme of study.

Quizizz is a gamified online tool for teaching and learning a subject. As such, it is appropriate and useful to be used as a re-inforcement tool in the teaching of the Malaysian Religion and Customs subject, which that allows students to assess their knowledge and track progress. Quizizz also allows for instant feedback of quiz questions and players can access the quiz questions multiple times via their computers or mobile handphones.

According to Zhao (2019), Quizizz is available for free, and it is easy-to-use. Quizizz can be played by individuals or multiple players at the same time. Visuals in the form of pictures can be added in and there is scoring and ranking as well as performance data. The Malaysian and Culture quiz questions can also be repeated multiple times. There are 4 options of multiple-choice answers of A, B, C and D and students just need to select the correct option and they will receive immediate feedback to the correct answer. Additionally, Quizizz is free and carries a multitude of features such as incorporating multiple-choice questions, fill-in blanks questions and open-ended questions. It also allows quiz makers to input audio and visuals. The strength of Quizizz lies in its multi-platform feature which allows the ability to be used by any device with a browser. All in all, Quizizz is a learner-friendly tool to be used by students.

This paper reports the success of using *MARC 2.0*, an online quizizz game to teach culture to students in a fun manner. *MARC 2.0* can be accessed at: https://quizizz.com/join?gc=70420009

2. PROBLEM STATEMENT

Although Malaysia is world renowned as a learning hub, it still has strong Asian culture and values which may be “strange and different” to students of various cultural background especially foreign students who are pursuing studies here. So, how can Malaysian religion, beliefs and culture be introduced to students in a fun manner. *MARC 2.0* (short for Malaysian Religion and Customs). Quizizz game is the answer to this!

MARC 2.0 was developed as part of the teaching and learning for the Malaysian Religion and Customs subject and is taught to group of foreign students from universities in China as requirement for the Global Short Course Programme (GSC) in UITM Shah Alam under the ICEPS Global Studies programme .These students were taught the major religions in Malaysia which is Islam, Buddhism, Hinduism and Christianity, as well as festivals and customs pertaining to each religion. PowerPoint slides containing notes and visuals such as pictures were also incorporated into the lessons., these foreign students are given insights into the Malaysian way of life. At the end of course they had an internal assessment to attempt. To enhance their learning and understanding of the lessons taught in class, *MARC 2.0* quizizz game was developed.

3. METHODOLOGY

MARC 2.0 was developed using the Quizizz platform where questions were posed in an online game platform. Figure 1.0 below describes the process in developing *MARC 2.0* and utilizing it in the classroom for teaching-learning. A total of 155 used *MARC 2.0* and answered the survey questionnaire.

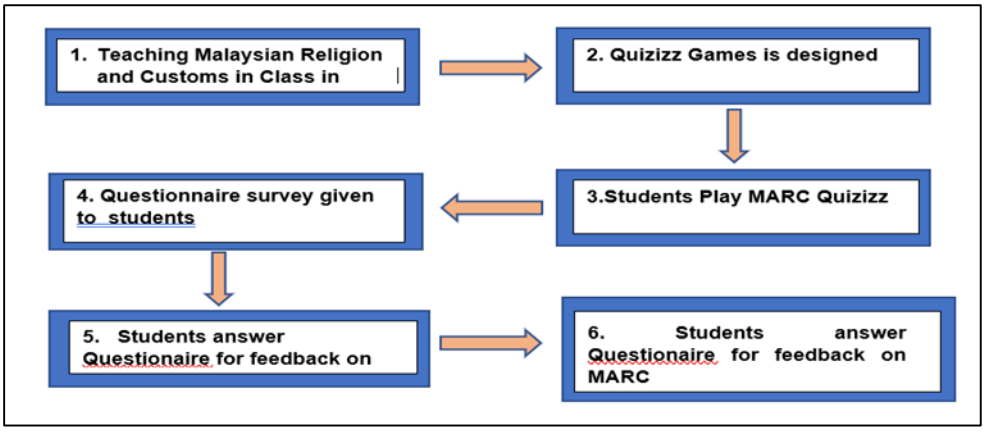

Figure 1.0: *MARC 2.0* Design Framework

4. RESULTS AND FINDINGS

Results of the effectiveness of using *MARC 2.0* to integrate Malaysian Religion and customs is given in as below:

i) MARC 2.0 is easy to use

Likert Scale response	Percentage
Strongly disagree	1.15
Disagree	2.30
Neutral	11.49
Agree	42.53
Strongly Agree	42.53

In terms of usage, 85% of the respondents agreed that *MARC 2.0* was easy to install and use. The students could install MARC 2.0 easily on their lapotops as well as mobile phones. Many of them prefered to use their mobile phone to play *MARC 2.0* as it can be played anywhere and at any time by just clicking on the link provided. As such, *MARC 2.0* is viewed as an interesting and user-friendly gaming tool.

ii) MARC 2.0 is effective in enhancing my learning of Malaysian religion and culture

Likert Scale Response	Percentage
Strongly disagree	8.05
Disagree	0.00
Neutral	6.90
Agree	50.57
Strongly Agree	34.48

One of the primary objectives in developing *MARC 2.0* as a gaming tool was to enhance undertanding of the lessons taught beyond lecture hours. This objective was fulfilled, as 85% agreed that they were able to better undertand the lesson by using *MARC 2.0.* This is in line with a study conducted by Zhao (2019) which stated the use of Quizizz in an accounting classroom whereby it was reported that the students enjoyed Quizizz. The inclusion of fun and interactive elements helped students to sustain their attention.

iii) MARC 2.0 has an attractive story board display

Likert Scale response	Percentage
Strongly disagree	1.19
Disagree	1.19
Neutral	22.62
Agree	46.43
Strongly Agree	28.57

75% of the repondents agreed that the pictures and visuals in *MARC 2.0* helped them better understand Malaysian religion and culture. Students said that the visuals were appropriate and relavant to the quiz questions posed. Some students did state that although they have some insights into the religion and customs in Malaysia, *MARC 2.0* has added more learning experience on this subject. They now are more aware of the culture and lifestlye of Malaysians. In addition, students were able to learn in their comfort zones. As these students were foreign students involved in online distance learning, *MARC 2.0* enabled them to study remotely in the comfort of their home country. The features in quizizz platform such as memes, avatars, themes and music were incorparted into *MARC 2.0* and this increased students motivation to learn the subject(Zhao, 2019).

iv) MARC 2.0 is fun and interactive.

Likert Scale responses	Percentage
Strongly disagree	3.49
Disagree	0.00
Neutral	8.14
Agree	40.70
Strongly Agree	47.67

88.37% agree that *MARC 2.0* is fun, interactive; and challenging. Quizizz lets students compete to measure their abilities against each other. The ranking in *MARC 2.0* allows students to compete against one another thus increasing their motivation to do better each time. Students who get avareage and mediocre scores will put in more effort to study harder to better their scores and rankings.

5. CONCLUSION

Results from the studies on the effectiveness of *MARC 2.0* as an online quiz game to introduce Malaysian culture and religion reveal that the students who used it found it to be highly beneficial and gave favorable feedback towards its design and content. Meanwhile results from the survey also stated that 79% of the students found that *MARC 2.0* has reinforced their understanding of the lesson taught in class while 81% agreed that the feedback on correct answers options in *MARC 2.0* has helped them better understand and have insights into the various religions, beliefs and customs in Malaysia. Thus, *MARC 2.0* has been able to fulfill the objective of teaching and learning of the Global Study Programme and can be used as an extension beyond online lectures. Ross, et.al, (2018) advocates that quizzes also encourages independent learning.

In short, *MARC 2.0* can be used as a technological teaching tool in line with the objectives of the Industrial Revolution 4.0 in teaching and learning (IR 4.0) which calls for the use of interactive methods in teaching-learning and assessments. *MARC 2.0* in this study is an effective interactive game in providing knowledge and input to the subject of Malaysian religion and customs and to

teach Malaysian culture in a fun manner, especially to foreign students pursuing their studies in Malaysia. An added advantage is it is easy to install on any platform and is free for students to use at any time. Kim and Bong (2006) in Nuci et.al (2020) state that interactive games and multimedia in online teaching and learning fulfills the needs of IR 4.0 in this new digital era. *MARC 2.0* is a welcomed innovation as it "harnesses the potential of digital technology and meets the demand of technology enabled platforms that compels students to have self-learning skills" (Oke & Fernandes, 2020). Future research could incoporate other aspects of Malaysian culture in *MARC 3.0* such as festivals, food, clothes and lifestyle.

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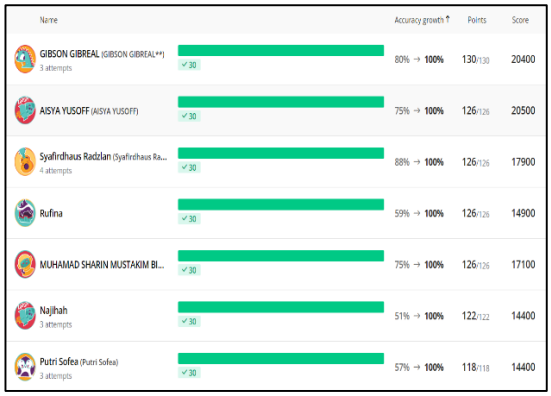
APPENDIX

Questions and visuals in Marc 2.0 quizizz game



Ranking, score and correct answers given.

MODELLING A STRATEGIC USE OF RECORDS AS STRATEGIC RESOURCE IN THE MALAYSIAN PUBLIC SECTOR

*Mohammad Azhan Abdul Aziz[1], Norhayati Hussin[2], Abd Latif Abdul Rahman[3], Mohamad Rahimi Mohamad Rosman[4] and Nor Azlina Ab. Ghani[5]

[1,3]Information Science Studies, College of Computing, Informatics and Mathematics, Universiti Teknologi MARA, Cawangan Kedah, Kampus Sungai Petani, Kedah, Malaysia.

[2]Information Science Studies, College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Negeri Selangor, Kampus Puncak Perdana

[4] Information Science Studies, College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Negeri Kelantan, Kampus Machang

[5]Perpustakaan Negara Malaysia, Kuala Lumpur

azhan@uitm.edu.my

ABSTRACT

Record surely can be identified in most organizations but the practices of record management may be only some of the organizations are familiar with it. Hence, records ought to be overseen as a vital asset to encourage the daily function and operation of the organization. Record as a strategic resource is defined that records as a medium to improve the effectiveness and efficiency of the organization, it becomes a strategic resource that provides for future use. The study aims at describing how public records are managed and used among officers in departments and ministries of the Malaysian government. The respondents and key informants engaged in this study are Diplomatic Administer Officer (PTD) from different position grades starting from grade M44 to JUSA because they are categorized as top management that acts as administer, policymaker, decision-maker, etc. in the organization. The respondents were randomly selected from twelve ministries and one department of the Malaysian public sector in Putrajaya. Findings show that all hypotheses are accepted. Records users as found to have a significant and positive relationship with strategic use of records. Records value was also found to have a significant and positive relationship with strategic use of records same as the relationship between records user and records value. Moreover, records value is hypothesized as a mediator between records user and strategic use of records also indicate the same result. The results of the study have contributed to the development of research model and theory in using records as a strategic resource especially, in the government sector. Government servants especially PTD officers must use records as one of the strategic resources in carrying out their daily affairs. Systematic record management needs to be further strengthened to ensure that the preserved memory of corporate enemies contributes to the development of a developed and rapid nation.

Keywords: Records management, Diplomatic administer officer, Malaysian government

1. INTRODUCTION

Records become an important resource nowadays especially in government sector and their absence will result in inefficiencies or failure in operating procedures (Kansas State Historical Society, 2007). Records are a key resource for organisations and should be used in accordance with the sound record management practises (Mutula and Wamukoya, 2009). Furthermore, Shepherd (2010) stated that individual and organizations create records of their current activities to support management, ensure accountability and culture to meet the needs of society for collective memory and to protect the identity of individuals and communities and their histories.

According to Mwaura (2013), Malaysia is regarded one of the countries that has accomplished a great measure of economic prosperity and has become a model of economic progress and development for developing countries. It was realized as early as in the 1960's that Records Management in Ministries and Departments should be improved upon to bring about efficiency and effectiveness in the delivery of services, ensure integrity and accountability as well as eradicate or minimize corruption. Since then, Malaysia has been enjoying the positive impacts of managing its record efficiently and strategically. However, despite the crucial role of records described above, researchers agree that many organisations, including government departments, pay little attention to records management (Chinyemba & Ngulube, 2005). In Malaysia, for example, government departments and businesses sometimes treat recorded information carelessly, oblivious to the fact that records are essentially important as other resources of financial, people, money, and equipment (Zawiyah M. Yusof, 1999). In the light of the mentioned issue, it is therefore relevant for the researcher to explore the strategic use of records in the public sector of Malaysia.

2. LITERATURE REVIEW

Records are kept and preserved to ensure all activities and transaction are recorded and become a strategic resource in the future. Furthermore, the International Standards Organization [ISO 15489] (2001) defined a record as an information that is created, received, and kept as a source of reference for an organization and individuals in carrying out a business and purpose. Records are essential to all organizations. They improve the effectiveness of operations and document services in organizations by enhancing the delivery of services, supporting the administration, documenting rights and responsibilities of individuals, and capturing evidence of the work in public authorities. Implementation of proper records management leads to good public management since government activities are based on the access to information contained in records (Smith, 2008).

Wamukoya's theories on the importance of records management may be summarized with reference to the Northwest Territories (2002) which viewed the role of records in an organisation as assisting organisations in providing services in an orderly, efficient, consistent, and equitable manner, supporting policy and management decisions, supporting current and future research activities, assisting organisations in meeting legal obligations and defending themselves against lawsuits, and assisting organisations in protecting the public's right to information by keeping or destroying records. Records management goes beyond the traditional conceptualization of usage that involves several dimensions. Therefore, this study looks upon similar topics and field of study. Five theoretical perspectives were selected for consideration. The justification of selecting these theories is: (1) the theory applies to certain domain of work – motivational, process, job or task, (2) the theory explained work design and user engagement, (3) the theory includes technological (technical). Human (individual), and contextual (environment) to explain the work design and user engagement. The five theories selected are Records Life cycle Theory, Sociotechnical System Theory (STS), Flow Theory, Social Cognitive Theory (SCT) and Individual Differences Theory.

3. METHODOLOGY

This study adopted a combination of exploratory, descriptive, and hypothesis testing. First, it is exploratory because there is lack of research on strategic use of records, as well as and the lack of knowledge on the effect of contextual dimensions towards the strategic use of records. Second, this study used descriptive statistics. Third, it also involved hypothesis testing as a several hypotheses were formulated during the development of the theoretical framework. For the type of investigation, the focus of the study was to test the correlation between the variables. Even though there might be causal relationship between variables, the objective of the study did not focus on the causal relationship; instead focusing on determining the relationship between variables through correlation.

In terms of unit analysis, the study adopted individual analysis. For the sampling, the study adopted nonprobability sampling specifically purposively sampling. The respondents and key informants engaged in this study are Diplomatic Administer Officer (PTD) from different position grades starting from grade M44 to JUSA because they are categorized as top management that acts as administer, policymaker, decision-maker, etc. in the organization. The respondents were randomly selected from twelve ministries and one department of the Malaysian public sector in Putrajaya. The study conducted is quantitative method. A total of 271 questionnaires were collected and only 266 were analyzed using SPSS and Smart-PLS software.

4. RESULTS AND DISCUSSION

Several techniques were conducted in order to assess the non-response bias. A total of 271 responses were returned; in which 5 responses were excluded due to empty dataset and not completed. As a result, 266 usable responses were used for further analysis. The Prime Minister Department recorded the highest respondent responses with 25.9% (or n=69), meanwhile the Ministry of Health had the second highest with 12% (or n=32). The third highest response rate was recorded by the Ministry of Education with 8.3% (or n=22). The fourth highest response rate was shared both by the Ministry of Rural Development and the Ministry of Agriculture & Agro Based Industry with 7.1% (or n=19). Ministry of Water, Land & Natural Resources and Ministry of Defense shared the same number of responses rate of 6.4% (or n=17). Next is the Ministry of Finance and Ministry of Energy, Science, Technology, Environment & Climate Change with the same number of response rate of 6% (or n=16). This follows by the Ministry of Foreign Affair with 4.5% (or n=12) and 3.4% (or n=9) for the Ministry of Works, Ministry of Communication & Multimedia and Ministry of International Trade & Industry.

4.1. Level of Strategic Use of Records

Descriptive analysis shows that majority of the respondents leant towards positive responses. Therefore, it can be deduced that most of the respondents believed that good governance can be performed by using records strategically. Respondents were aware that the existence of records can assist their daily routine work smoothly. The finding of the study shows that most of the respondents at the ministries and department of Malaysia government use records to achieve accuracy in their task. Records have become as an important references source in their daily routine task.

4.2. The Impact Records User on Strategic Use of Records

Two variables were used to measure the impact of user attitude and user participation on the strategic use of records. Each variable consisted of fourteen items and eight items. A higher order construct was developed to simplify the relationship among variables. The result of hypothesis one (H1) shows that Records User (RU) (user attitude and user participation) positively and significantly affects the strategic use of records. (H1: Supported, $\beta = 0.6474$, $t = 12.0563^{**}$, $p < 0.05$). This indicates that the PTD officers' attitude and participation in the strategic use of records in terms of

GOG, EVI, DEM and SEF have significant impact. Looking into the descriptive analysis of user attitude and user participation, the overall mean score indicates that the PTD officers were able to realise the benefits used of records in their daily task.

4.3. The Impact of Records Value on Strategic Use of Records

Two variables were used to measure the impact of records value on strategic used of records. Ease of use (EOU) was measured using thirteen items and ease of usefulness (USE) was measured using fourteen items. A higher order construct was developed to simplify the relationship among variables. The result of hypothesis two (H2) shows that records value positively and significantly affects the strategic use of records. (H2: Supported, $\beta = 0.2975$, $t = 4.9287^{**}$, $p < 0.05$). This indicates that the combined effect of EOU and USE positively influences the PTD officers in using records. This implies that if users consider records are useful and improve their task in their organization, then they will be more likely to continue using the records. Therefore, the organization must consider the needs of users in managing records systematically. Thus, if records management program is effective and practical, this will strengthen the users' perceived ease of use of records.

4.4. The Impact of Records User on Records Value

Two variables were used to measure the impact of user attitude and user participation on records value. Each variable consisted of fourteen items and eight items. A higher order construct was developed to simplify the relationship among variables. The result of hypothesis three (H3) shows that Records User (RU) (user attitude and user participation) positively and significantly affects records value. (H3: Supported, $\beta = 0.681$, $t = 16.58^{**}$, $p < 0.05$). This indicates that PTD officers' attitude and participation in the records value have significant impact. The findings of the study revealed that there was a significant positive relationship between the use of the records and ease of usefulness as well as user attitudes. This means that users are likely to form a positive attitude towards using the records when it is proven as a useful tool to the practice and vice versa. The findings of the study revealed that there was a significant positive relationship between ease of use and user attitudes towards using the records. This implies that ease of use by the user influences the attitudes towards using the records significantly. In other words, users intend to use the records more frequently as the records become easy to use. The findings of the study also revealed that there was a significant positive relationship between user participation towards using the records and ease of use as well as ease of usefulness. This implies that the ease of use and ease of usefulness influence the user participation in using the records significantly.

4.5. Research Contribution

Based on the mentioned theories and models, this study developed a conceptual model based on empirical assessment describing the strategic use of records, its determinants, and impacts. The model consisted of 8 variables under three dimensions: Records user, records value and strategic use of records. Upon completion of the measurement model, two (2) items were removed due to low loading factors. Henceforth, the main theoretical contribution of this study is the development of empirically tested and validated model of Strategic use of records, its determinants, and impacts. Since the literature on the strategic use of records is sacred in numbers, this study will promote the concept of engagement among government servant and practitioners. Findings within other domain showed that strategic records do have significance relationship with records user and records value. However, the empirical evidence of this relationship is scarce and almost non-existent within the context of Records and Archives management. Therefore, this study provides empirical evidence of the relationship between strategic use of records, its determinants and impacts. One of the practical contributions of this study is the development of comprehensive instruments to measure the strategic use of records, its determinants, and impacts. In the context of this study, the instrument used was a

survey consisting of 69 items. The instrument was developed by adapting and adopting instruments from the previous research with the combination of new items especially in the context of strategic use of records. The conceptual framework was used as guidance for the development of the questionnaire.

5. CONCLUSION

The study shows that the PTD officers at the departments and ministries in the Malaysian government agreed that the engagement with records user and records value improves strategic use of records in organization. A higher level of engagement leads to a higher level of records usage. The level of engagement was predicted by two dimensions: records user and records value. The resulting conceptual framework introduced in this study benefits both researchers and practitioner. Researchers may use the conceptual framework to further extend the framework in different situations. Practitioner may also use the result of this study to assess the level of strategic use of records in their organization.

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A WEB APPLICATION DASHBOARD: AN APPLICATION OF BIBLIOMETRIC ANALYSIS OF ZAKAT

Ashraff Ruslan

Lecturer, School Mathematical Sciences, College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Melaka

ashraffruslan@uitm.edu.my

ABSTRACT

In general, displaying Bibliometric Analysis of Zakat results as a dashboard is difficult for researchers, especially when certain graph outputs cannot be included due to limited technical knowledge and the limited type of charts available in the market. This web application displays Bibliometric analysis with the *Biblioshiny* web application from R programming. Bibliometric analysis, including several charts, is used to visualize the science mapping. One of the major benefits is for non-coders which the researcher can create an interactive dashboard utilizing an open-source dashboard platform without having to go through a hassle in coding to perform bibliometric Analysis. Researchers will also benefit from Diversity: which can display results through interactive charts and visuals, Rapid prototyping: which can reuse the dashboard for another subject and parameters, Design: sophisticated graphic capabilities can be created, and Structured: having a clear framework of analysis and the results can be added into report compilation and be downloaded in single Excel document with different sheets according to analysis flow.

Key Words: Bibliometric Analysis, Web dashboard, Zakat bibliometric, Zakat trend

1. INTRODUCTION

Zakat is a Muslim obligation. Paying zakat is proof of a Muslim's faith and piety besides praying (Hayeeharasah et al., 2013). Zakat has become one of the Islamic financial instruments that have significant roles in overcoming the problem of poverty (Amalia et al., 2020). The contribution of zakat to Islamic social well-being has long been recognized on its significant role. Due to the rapid growth of scientific research in Zakat, there is an urgent need to examine trends in knowledge construction and plan future research and Bibliometric analysis is one of the solutions to this need.

Organizing bibliometric analysis could be time-consuming and challenging especially when certain graph outputs cannot be included due to limited technical knowledge and the limited type of charts available in the market. Therefore, the *Biblioshiny* web application dashboard can be utilized to address these challenges.

This web application displays Bibliometric analysis with the Biblioshiny web application from R programming. Bibliometric analysis, including several charts, is used to visualize the science mapping.

2. LITERATURE REVIEW

Few researchers were found to explore bibliometric analysis in the Zakat area. It would be wise to look at the bibliometric tools in general and the application of Zakat recently.

2.1 Biblioshiny Application

Biblioshiny is an open-source tool for executing a comprehensive science mapping analysis of scientific literature (Aria & Cuccurullo, 2017). It was programmed in R to be adaptable and simple to integrate with other statistical and graphical packages. Indeed, bibliometrics is an ever-changing science, and bibliometrics has the ability to be rapidly improved and incorporated.

2.2 Bibliometric Analysis of Zakat

Researcher globally has utilized different tools in performing bibliometric analysis Haneef (2022) has focused on examining and evaluating the trends in Islamic economics research, analysing the contents and topics in relation to the primary objectives of the discipline, and recommending future research trends based on current realities and objectives which has adopted the PRISMA-P process in the research.

Wahyudi, M., Ahmi, A., & Herianingrum, S. (2022) in their research of Zakat was aimed to examine the development of zakat research from the aspects of five bibliometric indicators: (1) current development of zakat research and its distribution; (2) topic areas and themes in zakat research; (3) main contributors of zakat research; (4) current collaboration pattern in zakat studies; and (5) most influential documents in zakat literature has utilized Microsoft Excel for frequency analysis, VOS viewer for data visualization, and Harzing's Publish or Perish for metrics and citation analysis

3. METHODLOGY

This study aims to demonstrate the *Biblioshiny* web application dashboard from R programming in performing bibliometric analysis. The keyword Zakat is used to retrieve articles from the Scopus database and metadata of the articles obtained was downloaded into CSV files which contained the metadata of 661 articles. The web application dashboard was generated from Rstudio.

4. RESULTS & DISCUSSION

Figure 1 shows three lines of code that were used to generate the web dashboard.

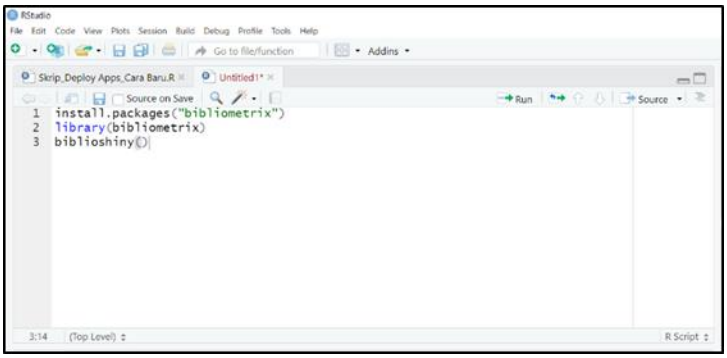

Figure 1. Generating Biblioshiny web dashboard.

The metadata then was loaded into the web dashboard and ready to perform a bibliometric analysis. The completeness of bibliometric metadata can be observed once the data was loaded in the dashboard as shown in Figure 2.

Figure 2. Generating Biblioshiny web dashboard.

Once the metadata was uploaded, researchers could easily obtain the results of bibliometric analysis according to the framework provided by the *Biblioshiny* which has four level domains of analysis including Overview, Sources, and Documents. On top of that Biblioshiny also provides the clustering and three Knowledge Structures of Analysis including Conceptual, Intellectual, and Social. Each analysis has it respective metrics, unit of analysis, and statistical techniques as demonstrated in Figure 3.

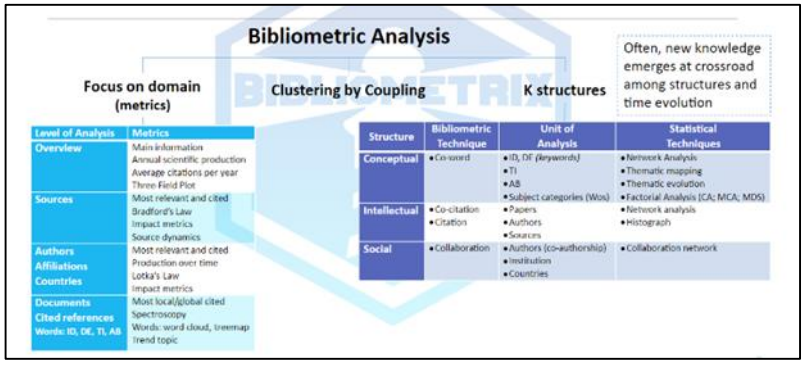

Figure 3. Bibliometric analysis layout adapted for Zakat studies.

This web application has greatly reduced the technical work in performing bibliometric analysis which provides the user with more than 40 results of analysis with complete charts. Figure 4 depicts the result of the Thematic map of Zakat which was part of the analysis provided in this platform.

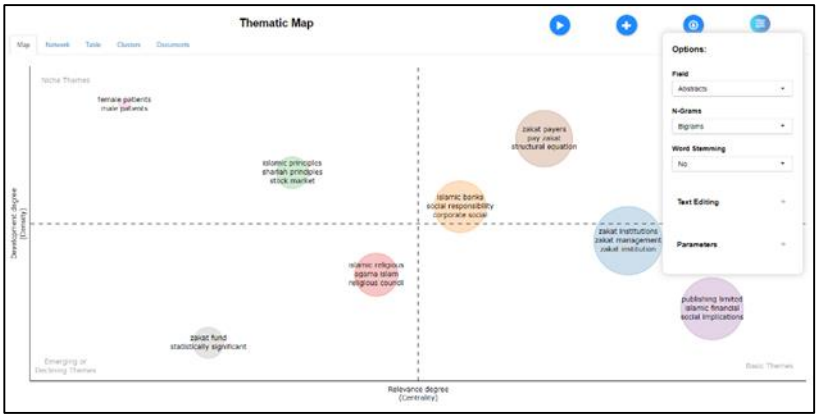

Figure 4: Thematic map of Zakat based on the abstract's term

Based on Figure 4, eight clusters were formed based on the abstract of 661 articles and mapped into four quadrants of themes that indicate the Motor, Niche, Emerging or Declining, and Basic

themes. Researchers were free to choose the unit of analysis according to their research focus and objectives. The user-friendly interface with additional features of compiling the report into one document can greatly reduce the amount of time needed to perform the bibliometric analysis.

5. CONCLUSION

The current research has demonstrated the application of Biblioshiny in performing bibliometric analysis of Zakat. One of the major benefits is for **non-coders** which the researcher can create an interactive dashboard utilizing an open-source dashboard platform without having to go through a hassle in coding to perform bibliometric Analysis. Researchers will also benefit from **diversity:** which can display results through interactive charts and visuals, **rapid prototyping:** which can reuse the dashboard for another subject and parameters, **design:** sophisticated graphic capabilities can be created, and **structured:** having a clear framework of analysis and the results can be added into report compilation and be downloaded in single Excel document with different sheets according to analysis flow.

RECOMMENDATION

One of the study's limitations is that the data for this study was only gathered from the Scopus database. It would be far more advantageous if other researchers could conduct bibliometric analyses of Waqf by combining the data from Dimensions, PubMed, Web of Science (WoS/Wok), the Cochrane Library, or another database.

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DEAR SIR: SMART INTERACTIVE RESEARCH TOOL FOR BEGINNERS

Siti Daleela Binti Mohd Wahid[1], Norraidah Binti Abu Hasan[2], Ahmad Sapuan Bin Hasan[3], Norzianis Binti Rezali @ Abdul Sukor[4], Sulaiman Bin Mohammed Khalid[5], Nadia Hanum Binti Amiruddin[6]

[1]Faculty of Business and Management, Universiti Teknologi MARA Cawangan Melaka, Malaysia

[2]Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA Cawangan Negeri Sembilan, Malaysia

[3]Mechanical Department, Politeknik Kuching, Sarawak, Malaysia

[4]Commerce Department, Politeknik Tuanku Syed Sirajuddin, Perlis, Malaysia

[5]Tourism and Hospitality Department, Politeknik Muadzam Shah, Pahang, Malaysia

[6]Faculty of Entrepreneurship & Business, Universiti Malaysia Kelantan, Kelantan, Malaysia

[1]sitid365@uitm.edu.my

ABSTRACT

Covid-19 pandemic has changed the way how a classroom lecture being conducted. Direct physical interactions are no longer a norm. This includes how the information is accessed. Researchers who are not ready to adapt new norm may takes longer time to finish his research, lost direction on where his research supposed to end, or simply give up. Therefore, we initiate and create Dear SIR that makes learning interactive, simpler, and combined theoretical and practical, and more effective. Dear SIR is a mobile application which acted as a research alternative tool to ensure teaching & learning (T&L) more interesting and interactive. We developed Dear SIR application with an objective to assist university's students and amateur researchers to understand the basic idea of research processes. Even though, there are numerous of research aid available in the market, but none of them practically guide the student to comprehend how to identify and align the research issues, objectives, questions, hypotheses, and framework development. The idea for product development derived from an in-depth discussion based on our own experience during our doctoral study period. No one guide us on how to identify all research elements when we read an article or develop our research. Surprisingly, very limited comprehensive research application can be obtained to lead us on how to classify the most crucial elements of research. Therefore, we realising this idea and starting to develop Dear SIR research tool. Evidently, the Dear SIR utilized the concept of "finding pieces of the puzzle and putting it together" to understand the complex research process to assist students and amateur researchers.

Key Words: research tool, smart interactive mobile apps, research student, advanced technology

1. INTRODUCTION

DEAR SIR is a mobile application which acted as a research alternative tool to ensure T&L more interesting and interactive. We developed DEAR SIR application with an objective to assist university's students and amateur researchers to understand the basic idea of research processes. Even though, there are numerous of research aid available in the market, but none of them practically guide the student to comprehend how to identify and align the research issues, objectives, questions, hypotheses, and framework development. The idea for product development derived from an in-depth discussion based on our own experience during our doctoral study period. No one guide us on how to identify all research elements when we read an article or develop our research. Surprisingly, very limited comprehensive research application can be obtained to lead us on how to classify the most crucial elements of research. Therefore, we achieve this idea and start to develop DEAR SIR research tool. Evidently, the Dear SIR utilized the concept of "finding pieces of the puzzle and putting it together" to understand the complex research process to assist students and amateur researchers.

2. THE OVERVIEW OF DEAR SIR

a. Description of DEAR SIR

The **DEAR SIR** is a mobile application that used to ease students, lecturers, and amateur researcher to understand the concept of research elements. It is user friendly, systematic, structured, feasible and practical to be implemented to enhance our target group understanding and falling for research. **DEAR SIR** is comprehensive tool to guide users the important elements of research when reading a journal article. Currently, we have ran a pilot study to test it applicability among 8 postgraduate students at Universiti Teknologi MARA Cawangan Melaka.

b. The context development background

The flowchart diagram is created and used to illustrate every type of flowchart for each category of users. The flowchart is divided into two categories with different interfaces for the website and mobile application. Nutshell, we compiled the overall process of **DEAR SIR** application.

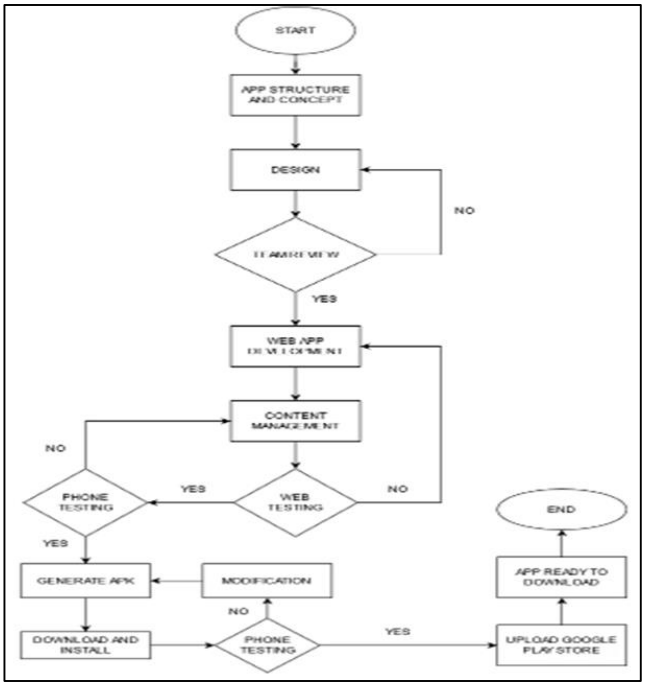


Figure 1. Flowchart for DEAR SIR Mobile Application Development

c. DEAR SIR is very significance because of several reasons:

i. Support the Malaysia Education Blueprint 2015-2025 (Higher Education) – This innovation directly support shift 1(holistic entrepreneurial balanced graduate), shift 9 (globalised online learning) and shift 10 (transformed higher education delivery)
ii. Cultivate Interest to Learn Research - DEAR SIR is an interactive research tool that able to capture student's attention and curiosity that subsequently eliminate the study difficulties. We developed this application with interesting features including colorful background, large font, user-friendly and understandable. Indirectly, it helps all education institutions to produce more researchers.
iii. Increase Number of Graduate on Time (GoT) - We believe if the students downloaded DEAR SIR tool, at least 1% of students will graduate on time. It is university's requirement to increase more GoT students, decrease dropout rates and achieve its organisational performance excellence.
iv. Increase Accessibility and Flexibility – We developed DEAR SIR to allow the students to have easy, functional access to information that they need in real-time and are optimized for hands on interaction.
v. Enhance the Student's Outcomes and Productivity – Learning research require patience and passion. If we can offer the best teaching aid product for them, it will enhance their interest and productivity. The target group will be able to understand the basic knowledge of the research elements and expedite the learning processes.

d. Advantages of DEAR SIR from education and community viewpoint

i. Education
- Achieve Malaysia education blueprint 2015-2025 (higher education) aspirations
- Increase university's MyRA score – Citation and university education service quality delivery
- Enrich interactive learning and transform from the traditional to modern education environment – Research methodology
- Enhance level of understanding on research processes

ii. Community
- Create the scientific thinking community
- Create ICT literacy community
- Spurred creative and innovative culture among academics' community
- Greater access to quality education

3. FINDINGS

We executed a survey to get some feedback on our products. There are 8 postgraduate students (5 master degree and 3 PhD) who participate for prototype (functionality) testing. We found that our product has greatly accepted by students. Here is the summary of our prototype (functionality) testing.

a. What do you think about this product? (Selected respondents)

Respondent 1: *Bagus. Saya pelajar semester 1 dan tidak tahu bagaimana untuk mengenalpasti point penting dalam satu-satu article. Saya rasa tool ini membantu saya untuk faham bagaimana hendak mengeluarkan point-point dari atikel.*

Respondent 2: Useful. I am from the industry. I have less knowledge about research. This product guide me how to identify important elements from an article.

Respondent 3: I love it. Good product.

b. Do you think this product can benefit you as a student? (Selected respondents)

Respondent 3: Absolutely. As a semester 1 student, I am "thirst" with new technology that can help me to learn effectively. I have tried it and WOW...It is amazing

Respondent 6: Ye. *Walaupun saya sudah berada di semester 4, product ini dapat memberikan saya sesuatu iaitu bagaimana kita hendak mencari elemen penting dalam artikel. Kita boleh membaca sebanyaknya artikel tetapi kita sendiri tidak tahu mcm mana nak cari point-point penting utk kita kenalpasti yang mana isu, gap, masalah. macam mana dari masalah itu terbentuk framework dan lain2.Sangat bgs la produk ini*

Respondent 7: Yes. Different approach to learn research methodology

c. What would help make this product more effective? Is there any feature you want us to improve? (Selected respondents)

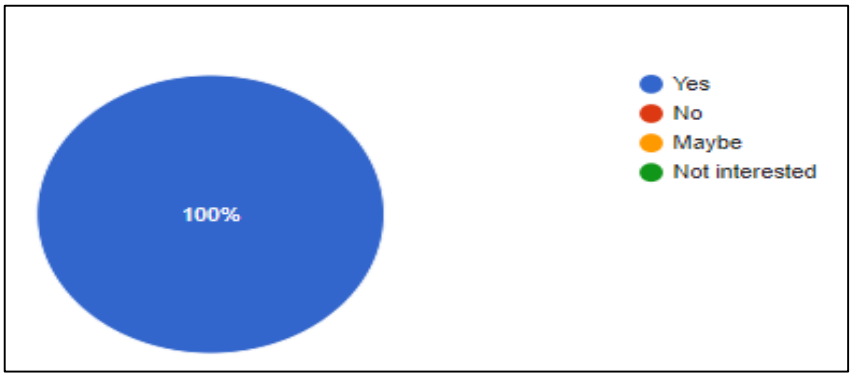
Respondent 4: I would suggest if this product could identify more categories, more elements and more papers for each category.

Respondent 5: Maybe can add some additional information such as proofreader service, editor service, formatting service to enhance your product visibility

Respondent 8: *Saya berpendapat, pelbagaikan kategori tu supaya lebih luas penggunaannya. Seperti dimaklumkan tadi, sasaran awal terbuka kepada pelajar S&S sahaja. Ada perancangan untuk membuat bidang S&T selepas ini.*

d. Will you purchase the product? (All respondents)

e. Will you purchase the product? (All respondents)



f. Any additional input you want to say? (Selected respondents)

Respondent 4: Maybe can make a collaboration with Mendeley and university library to more input. I would love to see more thesis to be reviewed like this. Some postgraduate candidate want to see the real thesis rather than article. Anyway, it is a good product!!

Respondent 6: *Saya yakin produk ini boleh diterima untuk memudahkan P&P pensyarah terutamanya untuk subjek* research methodology

Respondent 7: Good product

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AN OVERVIEW OF BASIC ECONOMETRICS: A SHORT NOTES E-BOOK

Nur Fadhlina Zainal Abedin & Faridah Pardi

Faculty of Business and Management, Cawangan Negeri Sembilan, Kampus Seremban

nurfadhlina@uitm.edu.my

ABSTRACT

The eBook 'Basic Econometrics: An Overview' represents a significant teaching and learning innovation in the field of economics education. This resource simplifies the traditionally complex subject of econometrics, making it more accessible to students. Through a blend of clear explanations, engaging visuals, and an overview-oriented approach, the eBook empowers learners to grasp fundamental econometric concepts with ease. Moreover, it not only prepares students for advanced textbooks but also offers a vision of future commercialization with additional content, exercises, and game-based learning elements. This eBook not only enhances the understanding of econometrics but also aligns with environmental sustainability by promoting digital educational resources. It marks a promising step towards a more student-friendly, interactive, and environmentally conscious approach to teaching and learning.

Key Words: Econometrics, E-Book, Short Notes

1. INTRODUCTION

In the realm of economics education, it's essential to bring innovation into teaching and learning to make complex subjects more approachable for students. "Basic Econometrics: An Overview" is an ebook that represents a significant leap in this direction, aiming to address the longstanding issue of students struggling to grasp econometrics. This project offers a fresh perspective and a solution to this challenge.

Econometrics, a key part of economics, has traditionally been perceived as complex and challenging, often causing students to shy away. Traditional textbooks use technical language and advanced mathematical and statistical concepts, making the subject appear intimidating (Morales, 2013). As a result, students often face difficulty in understanding econometrics, leading to a high failure rate. Recognizing this problem, the "Basic Econometrics: An Overview" project seeks to simplify the subject, making it more accessible to students.

The problem at hand is two-fold. Firstly, econometrics has been a concern for students due to its perceived complexity, resulting in a high failure rate. Secondly, conventional teaching materials have not provided an effective solution to this issue. Therefore, there is a pressing need for a more student-friendly and engaging approach to teaching econometrics.

The primary objective of the "Basic Econometrics: An Overview" project is to introduce an innovative teaching and learning resource that simplifies the complex subject of econometrics, making it more accessible to students. The project aims to bridge the gap between traditional, technically challenging econometrics textbooks and students' initial exposure to the topic. By offering a clear and concise overview, the eBook prepares students to tackle more technical econometrics materials with confidence. The project also plans to expand its content, introducing exercises with answers and elements of game-based learning to enhance student engagement and understanding (Byker et al.,

2022). Furthermore, the project aligns with environmental sustainability by promoting digital educational resources. This initiative is a significant step toward creating a more student-friendly, interactive, and environmentally conscious approach to teaching and learning in the field of economics education.

2. METHODOLOGY

The methodology for the development of the eBook, "Basic Econometrics: An Overview," involves several key steps and considerations as shown in Figure 1. The project begins with the compilation and simplification of content from diverse sources. Educators and econometrics experts collaborate to gather and refine material covering essential topics in econometrics. This phase is instrumental in making the content more student-friendly by breaking down complex ideas into clear and understandable explanations. The overarching objective is to demystify econometrics, a subject traditionally associated with complexity and technicality.

Visual enhancement is another critical facet of the methodology. Visual elements such as images, diagrams, and charts are thoughtfully integrated into the eBook. These visuals serve a dual purpose. Firstly, they complement the textual content, helping to illustrate key points and concepts, making the subject more engaging and relatable. Secondly, they cater to different learning styles, allowing students to grasp ideas through visual representation, fostering a more holistic understanding of econometrics.

Once the content has been compiled, simplified, and enhanced with visuals, it undergoes a rigorous proofreading and content editing process. This step ensures that the content is not only accessible but also of high quality, free from language ambiguities and inaccuracies. Clarity, accuracy, and readability are paramount to the project's success (Kassens, 2019).

The formatting of the eBook is the next vital phase. Proper formatting is crucial for maintaining consistency in fonts, styles, and layout. It ensures a seamless reading experience, enhancing the accessibility of the content and improving its overall presentation.

An International Standard Book Number (ISBN) is assigned to the eBook, providing it with an official identity and facilitating its cataloguing and citation. This step is a critical element of making the eBook a recognized and legitimate educational resource. Upon completing these initial stages, the eBook is published on suitable digital platforms to maximize accessibility for students. This digital format allows for ease of distribution and compatibility with various devices and eBook readers.

Looking to the future, the project has ambitious plans for further development. It intends to expand its content, introducing exercises with answers to support student learning and provide practical application of econometric concepts. Additionally, elements of game-based learning will be incorporated to make the material even more interactive and engaging for students.

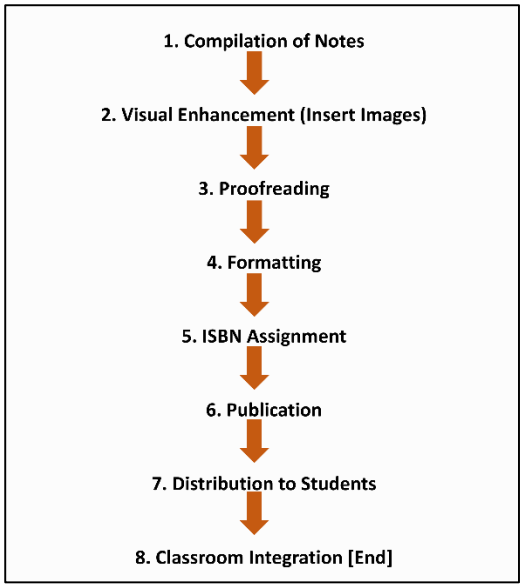

Figure 1. E-Book Flow Chart Process

3. RESULTS

The ebook, "Basic Econometrics: An Overview" has been successfully published and is readily accessible (Figure 2). Students, educators, and learners from diverse backgrounds can access the ebook for free through the following link: https://rebrand.ly/5yqnxdk. This accessibility ensures that the ebook is not only a valuable resource for the academic community but also for a wider audience seeking to enhance their understanding of econometrics without financial barriers.

Figure 2. The Basic Econometrics: An Overview E-Book

3.1 Innovativeness

The eBook introduces a fresh and innovative approach to teaching and learning in economics. It addresses a longstanding problem in econometrics education by simplifying complex concepts, enhancing comprehension, and increasing student engagement. Through the use of clear explanations, engaging visuals, and an overview-oriented approach, it bridges the gap between traditional, technically challenging textbooks and students' initial exposure to the subject. Moreover, the project plans to introduce content expansion with exercises and game-based learning elements, ensuring that it remains innovative and responsive to evolving educational needs.

3.2 Support for Environmental Sustainability

The project also aligns with environmental sustainability goals. By promoting digital learning materials, the eBook reduces the ecological footprint associated with traditional printed textbooks. It eliminates the need for paper production, minimizing transportation emissions, and conserving energy. Additionally, the eBook's digital format allows for easy updates and maintenance without the need for reprinting, contributing to sustainability efforts by reducing waste. This project not only enhances education but also supports a more environmentally conscious approach to teaching and learning.

4. CONCLUSION

In conclusion, this paper outlines the journey of "Basic Econometrics: An Overview," an innovative eBook designed to transform the teaching and learning of econometrics. By providing free access to this resource, we aim to make econometrics more accessible and comprehensible to a broad audience. Furthermore, this initiative aligns with the crucial goal of environmental sustainability. By promoting digital learning materials, the project reduces the environmental impact associated with traditional printed textbooks, contributing to a greener and more sustainable future. The "Basic Econometrics: An Overview" eBook stands as proof to the power of innovation in education, enabling students and learners from diverse backgrounds to access high-quality educational content for free. It is not just an eBook; it represents a step towards a more inclusive, innovative, and environmentally conscious approach to teaching and learning in economics.

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DIABETES IN RAMADHAN – AN INNOVATIVE GUIDE TO FASTING WISELY FOR PEOPLE WITH DIABETES

Fatimah Zaherah Mohamed Shah, Nur 'Aini Eddy Warman, Mohd Hazriq Awang, Aimi Fadilah Mohamed, Nur Aisyah Zainordin, Rohana Abdul Ghani

Endocrine Unit, Universiti Teknologi MARA

fatimah521@uitm.edu.my

ABSTRACT

The incidence of Type 2 Diabetes Mellitus (DM) in Malaysia is increasing, with 59% in Malays followed by the other races. Fasting in Ramadhan for those with DM is challenging and needs close monitoring with sufficient and comprehensive medical advice. Diabetic complications during fasting is mainly seen in patients with improper disease control or inadequate information. This guide aims to facilitate knowledge attainment and improve dissemination of information to mitigate the risk of complications in Ramadhan and to pave the way to fasting safely. Innovation product. A novel guidebook fashioned for educating people with DM and their care-givers on the proper approach to fasting safely in Ramadhan. A compilation of important information on managing the challenges DM patients face in the fasting month was assembled, gathered mainly from the Malaysian DM clinical practice guidelines and the International Diabetes Federation (IDF) Diabetes in Ramadan Guideline. This compendium was designed primarily in the Malay language to enable better understanding in the Malaysian population. This guide detailed essential knowledge on fasting in Ramadhan for people with DM, and was divided into a few categories, comprising of: risks and possible complications of fasting in people with DM, population categories at high risk for continuous fasting, adequate and timing of blood sugar monitoring, when to break of fast in the event of complication and steps to handle the situation, medication adjustment, dietary advice and tips on keeping active during the fasting month. Conclusion. A practical tool that is simplified for general use is essential in empowering people with diabetes to handle to their condition better and to facilitate safe fasting in the month of Ramadhan. This guide has been designed to fulfil this requirement and aspires to be beneficial in clinical practice and additionally function as a valuable instrument for personal and public use.

Key Words: Diabetes mellitus, fasting, Ramadhan, guidebook.

1. INTRODUCTION

The incidence of Type 2 Diabetes Mellitus (DM) in Malaysia is increasing, with an estimation of 3.9 million adults diagnosed according to the recent Malaysian National Health and Morbidity Survey (NHMS) in 2019. This is contributed largely by the Malay race with a prevalence of 59%, followed by the other races (National Health and Morbidity Survey [NHMS] 2019), translating into a significant proportion of people with diabetes who will be fasting in the month of Ramadhan in Malaysia. Indeed, Malaysia lies in the geographical region with the highest Muslim population in the world (International Diabetes Federation [IDF] 2021), and in an international survey assessing people with Type 2 DM it was seen that more than 95% of these patients fast in Ramadhan regardless of their diabetic control, contributing to the largest number when compared to the other participating countries (Salti I, Benard E, & Detournay B et al, 2004).

Fasting in Ramadhan for those with DM is challenging and needs close monitoring with sufficient and comprehensive medical advice. Diabetic complications during fasting is mainly seen in patients with improper disease control or inadequate information. This was illustrated in a nationwide survey looking at admissions to general hospital across the different states in Malaysia during the month of Ramadhan, which revealed a high number of admission due to diabetic emergencies, with more than half of the assessed population unable to recall receiving medical advice regarding managing diabetes in Ramadhan (Chin V.T. et al, 2021). To address this issue, an innovative guidebook was fashioned for patients attending the endocrine clinics in Universiti Teknologi MARA (UiTM) medical centre.

2. METHODOLOGY

A diabetes in Ramadhan patient education booklet was specifically designed and produced for the muslim diabetic patients in UiTM. This guide aimed to: 1) facilitate knowledge attainment and improve dissemination of information, 2) mitigate the risk of diabetic complications in Ramadhan and 3) pave the way to fasting safely. Referencing the Malaysian Type 2 DM clinical practice guidelines (Ministry of Health, 2020) and the International Diabetes Federation (IDF) Diabetes in Ramadan Guideline (IDF, 2021), important information on managing the challenges DM patients face in the fasting month was assembled and subsequently translated into an interactive and educational training program tailored for the local population. This compendium was fashioned mainly in the Malay language to enable better understanding in the local population

3. INNOVATION PRODUCT

Titled ‘Panduan Berpuasa Dengan Selamat Bagi Pesakit Diabetes’, this novel instruction booklet was utilized to educate people with diabetes mellitus on the approach to fasting wisely in the month of Ramadhan. Targeting mainly the population of patients and caregivers attending the endocrine clinics both at the Hospital Al-Sultan Abdullah (HASA) UiTM Puncak Alam and at the UiTM medical centre at Sungai Buloh, this guide was divided into a few parts, providing both a comprehensive and also and easy-to-understand management approach. Organized into three distinct parts, this program enabled effective multi-directional communication between patients, family members and healthcare professionals.

3.1. Overview on risks and complications

This guide initiates with an overview on fasting in Ramadhan for people with diabetes, covering both the advantages and possible risks. Outlining the physiological changes during fasting, this page states the risks and complications of prolonged fasting, particularly on the blood sugar levels, and patients can develop both high (hyperglycaemia) and low sugar (hypoglycaemia) levels during fasting.

3.2. Risk categories

This guide then details the risk categories for fasting during Ramadhan, divided into low, moderate and high-risk categories, with fasting recommendations for each group. Following that is a list on some of the criteria for the high-risk category. Clinic attended will undergo sessions with healthcare practitioners to calculate their individual risk and be informed regarding their risk category and fasting recommendations. This individualized approach facilitates optimal knowledge dissemination.

3.3. Monitoring and symptom recognition

An important aspect of this guide is the blood sugar monitoring recommendations. This page details the suggested timings for blood sugar monitoring during the fasting month, as well as

actions to be taken during episodes of abnormal blood sugar readings, both low and high sugar levels. Additionally, details on symptoms of complications, especially low blood sugar (hypoglycaemia) are listed clearly. These references are provided to empower people with diabetes to manage their diabetes optimally during fasting.

3.4. Action plan

As a special feature, this guide has a page dedicated to recognition and management of complications during fasting. Particularly, this part of the guide details steps to be taken during episodes of low blood sugar (hypoglycaemia), as well as follow-up approach.

3.5. Lifestyle recommendations

Recognizing that lifestyle modification is an important aspect in managing diabetes during fasting, this guide details recommendations and both dietary approach and physical activity during the fasting month. Dietary advice particularly during sahur and iftar are stressed upon, with fairly thorough information. Physical activity, incorporating light exercise and tarawih prayers are included in the management approach.

4. CONCLUSION

This novel and innovative diabetes in Ramadhan patient education guide was specially designed for better management of diabetes for patient fasting in the month of Ramadhan. It provides an essential service and aims to fill the gap in crucial knowledge dissemination that is urgently required in this country. This comprehensive and engaging program has been tailored to local specifications with potential for multi-centre engagement, as well as to enable patient empowerment and pave the way to fasting safely

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