



KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI



DIGES AKADEMIK

**Politeknik Sultan Salahuddin
Abdul Aziz Shah**

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**Pusat Penyelidikan, Inovasi dan Pengkomersialan
Politeknik Sultan Salahuddin Abdul Aziz Shah**



KEMENTERIAN PENDIDIKAN TINGGI



DIGES AKADEMIK POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

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PUSAT PENYELIDIKAN, INOVASI DAN PENGKOMERSIALAN

Politeknik Sultan Salahuddin Abdul Aziz Shah
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40150 Shah Alam,
Selangor.

SEKAPUR SIRIH

Assalamualaikum warahmatullahi wabarakatuh
dan Salam Malaysia MADANI.



Alhamdulillah, syukur ke hadrat Allah S.W.T. kerana dengan limpah kurnia-NYA Diges Akademik PSA bagi tahun 2024 berjaya dihasilkan. Syabas dan tahniah saya ucapkan kepada Jawatankuasa Penerbitan yang diselaraskan oleh Pusat Penyelidikan, Inovasi dan Pengkomersialan (CRI) Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA).

Penerbitan Diges Akademik PSA ini adalah suatu usaha murni bagi menyokong aspirasi negara dalam memperkayakan koleksi bahan ilmiah di institusi pengajian tinggi terutamanya dalam bidang pendidikan dan latihan teknikal dan vokasional (TVET). Usaha ini juga membuktikan bahawa PSA sentiasa responsif dan relevan dalam bidang penulisan, penyelidikan dan inovasi selaras dengan hasrat Pelan Pembangunan Pendidikan Malaysia 2015-2025 (Pendidikan Tinggi). Penulisan ini juga diharap akan menjadi wadah bagi perkongsian ilmu, pemikiran dan kepakaran dalam kalangan akademia, pihak industri dan komuniti setempat.

Semoga penulisan dan penerbitan di politeknik ini akan terus berkembang sehingga menjadi satu budaya dalam memartabatkan khazanah ilmu negara. Akhirnya, saya mendoakan agar Diges Akademik PSA ini akan dimanfaatkan oleh semua pihak demi kelestarian ilmu dalam sistem pendidikan negara.

Sekian, terima kasih.

Zainah binti Rujihan
Pengarah
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PRAKATA

Assalamualaikum warahmatullahi wabarakatuh
dan Salam Sejahtera.



Dengan penuh rasa syukur dan bangga, kami mempersembahkan Diges Akademik Bil. 7/2024 Politeknik Sultan Salahuddin Abdul Aziz Shah, sebuah himpunan penulisan ilmiah yang merangkumi pelbagai bidang TVET. Hasil Diges ini menterjemahkan komitmen dan dedikasi tinggi seluruh warga PSA untuk mencapai kecemerlangan melalui usaha berterusan dalam menghasilkan karya penyelidikan dan penulisan yang berkualiti serta berimpak.

Diges ini bukan sahaja mencerminkan pencapaian akademik serta kejayaan pelajar dan staf, tetapi turut menzahirkan semangat kolaborasi dan inovasi yang menjadi aspirasi utama kita sebagai sebuah institusi pendidikan.

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Ketua Pusat Penyelidikan, Inovasi dan Pengkomersialan
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MAGNETIC BLOCK GAME FOR SLOW LEARNER STUDENTS

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ABSTRACT: Slow learners often face challenges in recognizing alphabet letters during the learning process. This research introduces a game-based method, the Magnetic Block Game, designed to aid in alphabet and picture recognition. Initial development involved interviews with teachers from Sekolah Kebangsaan Meru 1 in Klang, Selangor. Observations of students interacting with the magnetic blocks were conducted to assess engagement. A focus group of fifteen students participated in a trial, which was documented through video recordings. Standardized feedback forms were used to interview three teachers for their insights on the project's effectiveness. Findings indicated high student motivation when using the magnetic blocks. Nearly 100% of the teachers agreed that magnetic blocks are effective educational tools for slow learners. Future considerations for the product include optimizing block size, adjusting product density, enhancing color attractiveness, and selecting suitable magnets.

Keywords: Magnetic Block, Education Tool Aid, Slow Learner Student.

I. METHODOLOGY

This project involved 3 phases. Phase 1 is a fieldwork study to gather early information regarding the existing teaching aids used in the school and the teaching and learning process in the class. Phase 2 is producing magnetic block-based data gathered in the fieldwork study. The final phase of product effectiveness testing involves using a video camera for teaching and learning observation and a standard form for teachers' feedback. In this study, a magnetic block measuring 70 mm x 20 mm x 18 mm was successfully produced. The magnetic block was made from rubber wood

and neodymium magnets and finished with oil paint and lacquer. The tools and machines used for this project are a mitre saw, measuring tape, table saw, brush, sander machine, Computer Numerical Control (CNC) machine, and laser machine.

Two magnets were attached at the back of each block, purposely to stick the block on the whiteboard. It has also been engraved with the alphabet and a picture on the front surface of each block, making it easier for students to recognize and feel the engraving of the alphabet and the pictures.

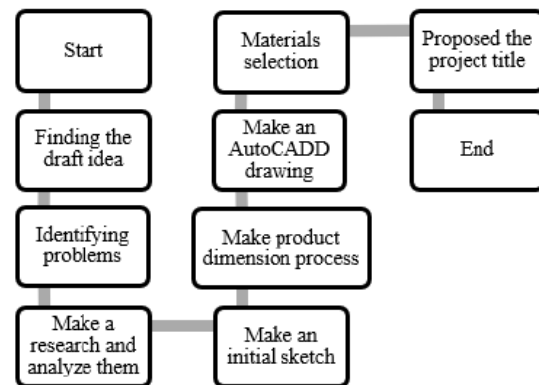


Figure 1: Flow Chart of Proposed Magnetic Block Project

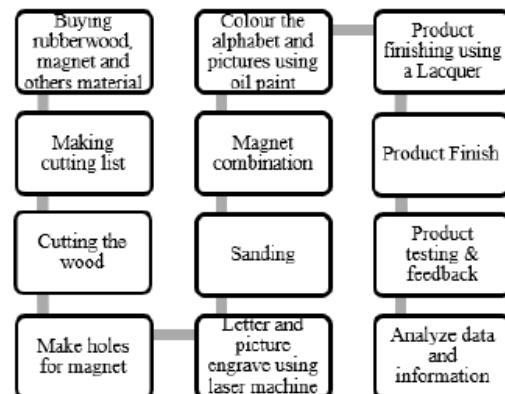


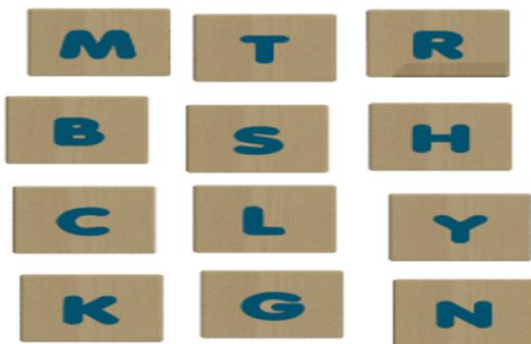
Figure 2: Flow Chart of Magnetic Block Manufacturing Process & Product Efficacy

Figures 1 and 2 outline the systematic approach to initial project work, the product manufacturing process, and product effectiveness. Figure 1 was involved in the phase 1 study, while Figure 2 was covered for phase 2 of the project. The effectiveness of Magnetic Block was determined in phase 3 by using an observation method through video capture and an interview session using the standardised feedback form. About fifteen (15) students and three (3) teachers were involved in this analysis. The data was analysed using Excel software and a qualitative method.

II. FINDINGS AND IMPACT OF THE PROJECT PRODUCT OUTCOMES



Picture 1: Alphabet for consonent letter (red colour)



Picture 2: Alphabet for vowel letters (blue colour)



Picture 3: Set 1 - Alphabet and Picture



Picture 4: Set 2 - Alphabet and Picture



Picture 5: Set 3- alphabet and picture.



Picture 6: Set 4- alphabet and picture



Picture 7: Set 5- alphabet and picture.



Picture 8: Set 6- alphabet and picture

In this project, the outcomes have successfully produced engraved alphabet letters for consonants (Picture 1) and vowel letters (Picture 2). This project also produced the six (6) sets for each letter and the pictures, namely: Set 1: 'AYAM', Set 2: 'IKAN', Set 3: 'LEBAH', Set 4: 'SEMUT', Set 5: 'KUCING', and Set 6: 'BURUNG' as shown in the Figs.3 - 8 above. The strengths and weaknesses of the product can be concluded from the statements in Table 1.

Table 1: Strengths and Weakness of product

Strengths	Weakness
Foster the curiosity of youngsters who are slow learners.	Magnetic Block encounters an issue with diminished potential for magnetic adhesion.
The size of the toy enables youngsters to play while gaining knowledge.	The game set is insufficient.

PRODUCT EFFECTIVENESS FROM AN OBSERVATION IN TEACHING AND LEARNING PROCESS

An observation during the teaching and learning process when using the magnetic block is shown in Pictures 9 (a-d).



Picture 9 (a-d): An observation process in the 3rd year special class at SK Meru (1), Klang, Selangor

From the pictures, it can be revealed that most students showed some interest while playing with the Magnetic Block product.

PRODUCT FEEDBACK FROM THE TEACHERS' PERSPECTIVE

Table 2 presents the proportion of respondents who provided feedback to the fifteen (15) survey questions concerning the efficacy of the magnetic block during its implementation at SK Meru (1), Klang Selangor. Three (3) respondents, or over ninety percent of the samples, felt that the magnetic block was useful as a teaching tool for slow learners' students. Nevertheless, more than thirty percent of the feedback suggested that the magnetic block still requires some enhancements, such as the size of the alphabet and the method of using it.

Table 2: Respondents feedback for Magnetic Block product at SK Meru 1, Klang

No	Statement	Strongly disagree	Do not agree	Agree	Strongly agree
1.	The games provided are interesting and fun.	0%	0%	30%	70%
2.	The games provided are safe to use.	0%	0%	30%	70%
3.	The games provided are easy to use.	0%	0%	0%	100%
4.	The size of the wood used is appropriate for the student.	0%	0%	0%	100%
5.	The size of the text and pictures used are appropriate and clear.	0%	0%	30%	70%
6.	Generate interest in learning.	0%	0%	30%	70%
7.	Help students work harder in solving problems related to letters and pictures.	0%	0%	30%	70%
8.	Improve understanding of letters.	0%	0%	30%	70%
9.	Have a positive impact on student achievement.	0%	0%	0%	100%
10.	Improve understanding in building words.	0%	0%	30%	70%
11.	Use of appropriate images for student understanding.	0%	0%	30%	70%
12.	Students understand how to use this game method.	0%	0%	0%	100%
13.	Game methods that attract students' attention.	0%	0%	30%	70%
14.	The game method is suitable for students.	0%	0%	0%	100%
15.	The use of the game method is very simple.	0%	0%	30%	70%

III CONCLUSION

The project successfully produced a magnetic block as a new teaching aid tool for the 3rd-year class at SK Meru. However, the thickness size, various sets of alphabets, pictures, and various categories of game sets should be further considered in future work. Costs may be reduced by using thinner wood block sizes, and the students can gain knowledge from a range of sets of magnetic block products.

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SUPERB KUSTRAP

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ABSTRACT: The Superb Kustrap is an innovative mousetrap product designed to address the frequent presence of rats in food premises due to hygiene issues. The product is placed in an existing trash bin and equipped with an Internet of Things (IoT) digital system. Its goal is to trap rats effectively. In addition, the product can also notify the owner of the premises when rodents are present. The structure of the Kustrap Superb is made of soft steel which can trap rats by 4 to 5 at a time. The size of this trap has been innovated from the existing trap which is 20 cm x 17 cm x 35 cm which is placed on the bottom in the existing bin at the food premises. The product acceptance survey included 30 respondents, including premises owners, customers, and local authorities (PBTs) around Shah Alam. The product was evaluated at four food premises in Shah Alam using various baits and rubbish to trap rats. We gather data using quantitative methods, such as questionnaires, and qualitative methods, like observation and interviews. The findings show that 96% of respondents find this product convenient for premise owners, local authorities, and customers. At the same time, 92% of respondents agreed that the electronic counter system can count the number of rats entering the mouse trap. In the test conducted around Shah Alam, the highest number of rat catches was 4 to 5 at each location at any given time, with a total of 18 mice in total. The feedback on Superb Kustrap was positive, showing great potential to reduce the presence of rats in food premises.

Keywords: Rats, Traps, Trash bins, Sensor, Superb

I. INTRODUCTION

In this era of globalization, the issue of rat urine disease, or its scientific name leptospirosis caused by rats, is often faced by Malaysians. Leptospirosis is an infectious disease caused by leptospira bacteria that is spread through rodents. If not treated immediately this disease can spread and be fatal. The virus will infect the victim when it touches the injured skin, enters the eyes, mouth or nose. Symptoms of infection include high fever, severe headache, chills, muscle pain, vomiting and yellowing of the skin and eyes. One of the ways that has been identified to overcome this problem is to control the presence and reproduction of the rat population itself. (MoH Official Portal, 2010).

The project is based on the problem of uncontrolled rat population in food premises which has been increasing in recent times. This project aims to reduce the rat population so that food premises are always clean and safe. In addition, it is possible to capture the optimal number of rats and track the number of rats entering the rat trap by using the Internet of Things (IoT) system. In addition, it can make it easier for food premises owners to deal with rodent problems. So, this project is also an improvement on the security and digital system to the existing rat trap compared to the rat trap that is usually used but has a high potential for rats to run away and can only catch a small number of rats. The purpose of this project is to place mouse traps in the trash bins so that customers at the food premises do not know about the presence of rats around the premises which can cause the reputation of the food premises to be polluted.

OBJECTIVES OF THE INNOVATION PRODUCTION STUDY

Through the research done, the researcher has set some objectives that must

be achieved in producing this innovation project and can be adopted by food premises around Shah Alam. Among the objectives set are:

- (a). Innovating garbage cans that trap rats with the optimal amount; and
- (b). To identify the number of mice that enter the mouse trap by using an electronic counting system (electronic counter) and the Internet of Things (IoT) system.

II. LITERATURE STUDY

Traditional rat traps have been a staple in pest control for centuries, offering a simple but effective way to catch mice. However, in the era of technological progress, there is an opportunity to increase the efficiency of this trap by combining innovative features. In this literature review, we explored the incorporation of ultrasonic sensors and magnetic sensors into mouse traps to create a more advanced and efficient mouse control system.

Traditional mouse traps rely on mechanical triggers, often leading to delayed detection and inaccurate response. The integration of ultrasonic sensors introduces a proactive approach to the detection of rodents. These sensors emit high-frequency sound waves that are outside the human hearing range but can be detected by mice. The ultrasonic sensor triggers the trap mechanism when the rodent passes through the trap area, ensuring faster and more accurate capture.

The integration of ultrasonic sensors is equipped with a notification system that sends alerts to the user's smartphone. This real-time notification feature is a game changer, providing users with instant information about the activity of rodents. Users can receive alerts regardless of their physical proximity to the mouse trap, allowing quick and informed action to address pest issues. To further improve the function of the mouse trap, a magnetic sensor was introduced to calculate the number of mice caught. Placing a small magnet on the main entrance part. So, every time a rat enters a trap, the sensor records the count, allowing the user to monitor the effectiveness of the

mouse trap over time. This data-based approach not only provides valuable insights into the severity of attacks but also helps assess the performance of Superb Kustrap.

The combination of ultrasonic sensors and magnetic sensors brings some advantages to the Superb Kustrap. First, the system offers a quick response to the activity of rodents inside the mousetrap. Secondly, the smartphone notification system ensures timely intervention. Finally, the calculation feature allows for a more comprehensive understanding of the condition of the pest, allowing the user to make an informed decision about further actions or adjustments to the trap.

In conclusion, the integration of ultrasonic sensors and magnetic sensors into mouse traps represents a new approach to rat control. This innovative system not only improves trapping efficiency but also provides users with real-time information and data for better pest management. Traditional traps with modern sensor technology mark an important leap in the field of pest control, promising more effective and humane solutions to issues related to rodents.

III METHODOLOGY

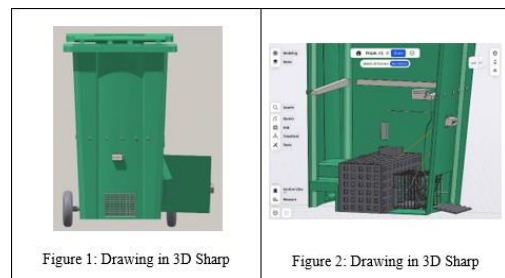


Figure 1: Drawing in 3D Sharp

Figure 2: Drawing in 3D Sharp

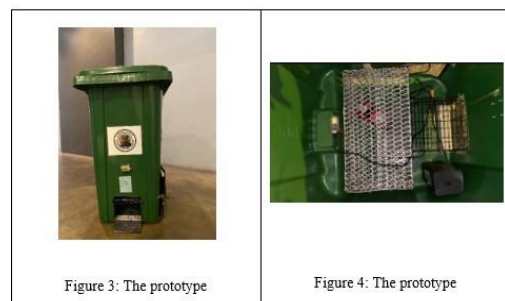







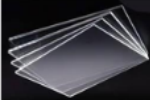

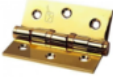







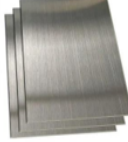

Figure 3: The prototype

Figure 4: The prototype

SUPERB KUSTRAP COMPONENTS

Table 6. 1 Components of Superb Kustrap

COMPONENT	USE OF MATERIALS
	240-liter trash can Trash cans as a temporary storage place for trash before being transported to a final processing place such as a final disposal site (TPA) or a waste treatment facility. With adequate trash cans, trash can be collected and separated more efficiently, reducing the risk of contamination and the spread of disease.
	Mousetrap A mouse trap is a mouse trap tool that is available in the market according to the specified size.
	Ultrasonic sensor An ultrasonic sensor is a device that measures the distance to an object using ultrasonic sound waves. Ultrasonic sensors use transducers to send and receive ultrasonic pulses that relay back information about the proximity of objects.
	NodeMcu ESP8266 (IoT Wireless WiFi Module Board) This is one of the boards that can connect to the internet which is NodeMCU ESP8266. This NodeMCU is created based on ESP8266. This board is open-source hardware that can connect with various other components, depending on what project you want to create.
	Power bank A device used to feed electricity into a rechargeable battery without having to connect the device to an electrical outlet. The power bank has a capacity for electricity so that when the power is depleted, the electricity must be replenished by connecting the cable to an electrical outlet.
	Electronic Counters The main function of a digital electronic quantizer is to count the number of events or objects that pass a certain point. For example, a quantifier can be used to count the number of people entering or leaving an area or to count the number of vehicles passing through a toll gate.
	Sensor (sensor) Sensors are used to detect and signal.
	Perspective Perspective is suitable for making models or prototypes for a product. A type of hard and durable plastic material.
	Rat poison Rat poison is a chemical specially designed to kill rats. The main function of rat poison is to control the population of rats that become pests or threaten human health.
	Door hinges The main function of the door hinge is to allow the door to open and close. Door hinges allow the door to move on its axis easily, allowing access into or out of a room or building.
	L brackets L-bracket (also known as elbow bracket) is a metal or plastic component that forms an L angle. The main function of the L-bracket is to provide support, reinforcement, and fastening to the structure.
	Cutter Bolt Mesh A bolt cutter, sometimes called a bolt cutter, is a tool used to cut chains, padlocks, bolts, and wire.

	Hacksaw A hack saw is a saw used to cut metal objects such as iron. It is called a hacksaw because usually things made of metal are called iron. In addition to metal, this saw can also be used to cut other materials such as PVC and wood.
	Jumper cable Jumper cables usually come in a variety of electronic kits, from some robotics to Arduino kits, etc. In addition, it is a very practical cable for a large number of electronic projects.
	Micro USB Micro USB can connect all mobile phone devices to computers and laptops. These features include support for data transfer, synchronization, and a charging port.
	Stainless steel plate The properties of stainless steel can be used in designs to support heavy loads. Other stainless steels can be heat-treated to make very high-strength components. Most stainless steels can be easily cut, welded, formed, machined, and fabricated.
	Blynk Apps Blynk is an Internet of Things (IoT) platform designed to facilitate the creation of in-phone applications to control and monitor the IoT stage.

PRODUCTION PROCESS

- (a). The selection of the project title which is Superb Kustrapis the result of a combination of great words, rat and trap.
- (b). Determining the problem statement, objectives, and scope of the Superb Kustrap study.
- (c). To survey food premises around Shah Alam.
- (d). Do research through journals, books, and articles as a reference and review of literature related to mouse traps, rats, and trash cans.
- (e). To obtain views from the external industry, namely the Shah Alam City Council (MBSA).
- (f). Design and install Superb Kustrap products.
- (g). Test on Superb Kustrap by placing products on food premises.
- (h). Make improvements based on observations and data taken from tests done on food premises.
- (i). Retest based on improvements that have been done on Superb Kustrap.

IV. FINDINGS / RESULTS

LOCATION	INSPECTION TIME OF THE PRESENCE OF RODENTS		THE PRESENCE OF RODENTS IN THE TRAP	THE NUMBER OF RODENTS IN THE TRAP
	NOON	NIGHT		
RESTORAN MAMAK RAHMATH BISTRO PRIMA UI	12.02	10.05	NONE BUT HAVE A TRACE	0
	12.15	11.17	HAVE	2
	1.08	10.12	HAVE	2
RESTORAN MAMAK MAHSYUR TTDI JAYA	12.15	10.01	HAVE	1
	11.13	9.01	HAVE	2
	1.32	12.01	HAVE	2
MEDAN SELERA POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH	12.31	11.01	NO	0
	11.01	9.51	HAVE	2
	1.21	10.15	HAVE	2
KAFETERIA KAMSIS POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH	11.15	11.19	HAVE	1
	1.32	9.55	HAVE	2
	12.01	10.45	HAVE	2
TOTAL				18

As a result of the studies we did, every location we did was a testing where rats were sitting but between seeing or not just the rat in the food premise. Based on the table above, we'll monitor Superb Kustrap at noon and night. From the table above, two locations that received numerous arrests were the Mamak Mahsyur TTDI Jaya Restaurant and the Sultan Salahuddin Abdul Aziz Shah Polytechnic Kamsis Cafeteria with five rats at each location. So, our objective was achieved as we managed to get optimal rat capture according to our Superb Kustrap suitability. The owner of the premise gave a positive answer to using Superb Kustrap at the food premises as it has a wide range of functions that can make it easier for users to reduce the number of rats in their premises.

V. DISCUSSION

POTENTIAL FOR COMMERCIAL PRODUCTS

Superb Kustrap has the potential to be commercialized if this product is improved and tested in other areas. It will help the production of quality products to be commercialized to consumers out there. Among the reasons it can be commercialized are:

- Can detect the presence of mice entering the mouse trap through phone notifications using the Blynk application.
- This product has user-friendly features.

- This product has several functions, among them, garbage disposal and rat traps.

SUGGESTION AND IMPROVEMENT

To help the research that will be carried out by any individual or party that wants to upgrade this product in the future, several suggestions can be made as improvements to the product. Among the recommendations are:

- "Superb Kustrap" is designed using a 240-liter trash can and a mouse trap that holds 4 to 5 mice at a time. In the future, the design can be changed according to the suitability of the product to facilitate testing on the product.
- Make a case according to the size that is suitable for the ESP-8266 as well as the ultrasonic sensor equipment to protect small components from damage.
- Change the materials in the product to materials that are anti-rust and have resistance in terms of damage from rat bites and wastewater leaks.
- Furthermore, it is possible to improve by changing the power bank to a solar panel that can supply energy without the need to recharge.

VI. CONCLUSION

In conclusion, the integration of such innovative technologies as the insertion of ultrasonic sensors and magnetic sensors into mousetraps signals a significant leap forward in pest control. By combining ultrasonic sensors, mouse traps acquire the ability to detect the presence of rodents with high accuracy and efficiency. This advanced technology ensures a quick and accurate response to a potential attack, minimizes the chances of escape, and reduces the time taken to deal with the problem. In addition, it can be formulated that this project has achieved the desired objectives. We hope that if this project is approved, we will be able to produce a mousetrap that catches rats with an optimal amount and is more efficient.

ACKNOWLEDGEMENT

The success and result of this project require a lot of guidance and help from many people. Whatever we have done is only for this kind of guidance and help, and we do not forget to thank them. I respect and thank Puan Zarina binti Mat Sapri for allowing us to do this job and provide support. This task could not have been completed without the efforts and cooperation of our group members, Husna Hariz, Syiratul Hafiz, Aisyah Ilyana, and Rabiatal Asyikin. Finally, we would like to thank the respondents, food premises owners, and local authorities for their support and willingness to spend time with us.

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EFFECTIVENESS OF TROLLEY USAGE FOR WOOD WORKSHOP AT POLITEKNIK SULTAN SALAHUDDIN ABDULAZIZ SHAH (PSA)

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ABSTRACT: The primary issue faced by users in the PSA Wood Workshop was moving huge and heavy wood panels to the machinery. A new trolley that can carry the wood panel was developed in this project as a solution to this issue. The trolley's production process began with a fieldwork research study, followed by preliminary sketches, CADD drawings, model development, product creation, and final product evaluation. The time study method and user survey analysis were used to evaluate the efficacy of trolley utilization. The project's results showed that although the trolley could lift the heavy wood panel, other elements, such as the trolley's size and design, still needed improvement in the future. The majority of consumers concurred that the new trolley at the PSA Wood Workshop's had successfully enhanced material handling.

Keywords: Trolley, Wood Workshop, Time Study Method, Material Handling.

I. INTRODUCTION

A trolley is small transport device used to move significant load from one place to another (Shiwarkar et al., 2018) Differing kinds of trolley exist and also the type used is commonly chosen supported what kind of material it'll move (Shiwarkar et al., 2018) Lifting the heavy loads things up to 150 kg is a challenge for the user if there are no lifting facilities (Lodaya et al., 2020). When designing a trolley, several factors must be considered, including the number and nature of the component to be stored, the trolley's size, weight, and intended use. Material and dimensions of the trolley are then determined accordingly (Sachin P. Dhavane, 2020).

A trolley is essential in the PSA Wood Workshop for lifting and transporting materials like medium-density fiberboard (MDF), chipboard, and plywood. The existing trolleys are sturdy, difficult to maneuver, and lack safety features. Taking time and exerting energy to move wood from storage to machinery increases the possibility of accidents. To address these issues, a new trolley is needed with improved safety features and efficiency to make handling wood easier for students and staff in the workshop. The main objective of this project is to propose a new trolley for PSA Wood Workshop. The scope of this project is to produce a new trolley, and the effectiveness of trolley usage was evaluated in this project.

II. METHODOLOGY

This study produced a new trolley with a density of 160 kg/m³ by using panels in a 3:1 ratio and solid metal. The trolley is made from steel, plywood, wheels, and a solid square bar that overall measures 1219.2 mm x 762 mm. The tools used for this task were table saws, measuring tapes, sandpaper, and sanding machines. The four rotating wheels of the trolley are used to facilitate the movement of wood. It features obstacles on the left, right, and centre to ensure the heavy panels are firmly positioned in the trolley.

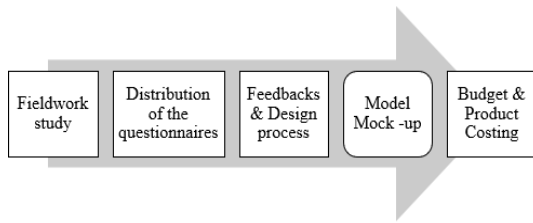


Diagram 1: Showed the flow chart process of preliminary study of this project.

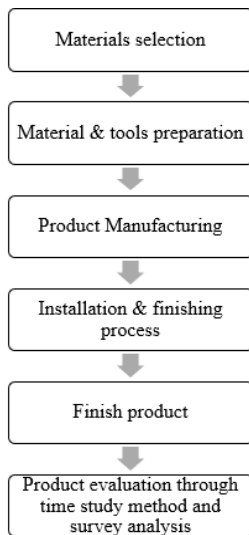


Diagram 2: Showed the manufacturing and evaluation process of trolley.

Diagrams 1 and 2 show the flow chart process of the preliminary work on this project and the trolley manufacturing process. The effectiveness of trolley usage was measured using the time study method, where different sizes of people handling the trolley, from wood storage to machinery, were involved in this evaluation. The best method for establishing standard time and boosting efficiency in any business is work study. The time and motion analysis methods are helpful for streamlining processes and cutting them down whenever it's feasible (Vekariya & Kumar, 2015). A stopwatch was used in this study as a tool to determine the accurate time involved in the material handling evaluation process. Meanwhile, the survey questionnaire was used in order to get feedback on the impacts of using the new trolley in the PSA Wood Workshop. The data was analyzed by using a percentage and an average in the Excel programme.



Pictures (1-8): showed the trolley fabrication process.

Pictures 1–8 showed the trolley manufacturing process, starting from the measuring process until the finished product.

III. FINDINGS AND IMPACT OF THE PROJECT

Figure 1 reveals the data findings for material handling accuracy when using the different sizes of people in the evaluation process. Two people were used in handling materials, either using or without the trolley. From Figure 1, it can be concluded that when using the trolley, material handling from the storage to the wood machines only takes less than 25 seconds compared to manual handling, which takes more than 30 seconds.

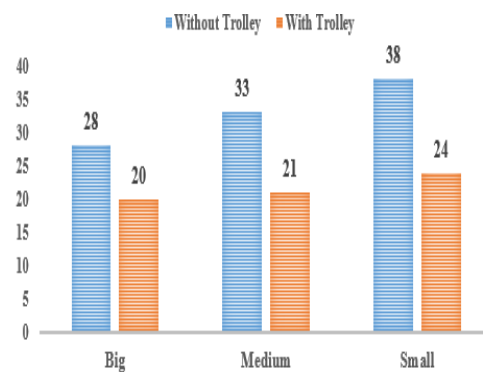


Figure 1: Average time of material handling accurate time for 2 persons with different body sizes involved in the evaluation process.

NO	QUESTIONS	Disagree	Agree	Strongly agree
1	Is the design of the trolley suitable for lifting goods?	10%	20%	70%
2	Does this cart work well?	0%	20%	80%
3	Is this cart suitable for use in a wood workshop?	10%	10%	80%
4	In your opinion, does this trolley make it easier for students and lecturers to lift and carry wood around the workshop?	10%	10%	80%
5	Is it suitable for this trolley to be made from grade b iron material to be used to lift and carry kayu?	0%	30%	70%
6	The rollers on the front and back of the trolley make it easier for the wood to go into the slot. Do you agree?	0%	10%	90%
7	Will the trolley handle make the trolley easier to control?	0%	0%	100%
8	The size of the trolley is ideal for lifting and carrying 4' x 8' panel wood.	10%	30%	60%
9	The division in the middle of the trolley makes it easier for students to regulate the wood panels being carried	0%	15%	85%
10	This trolley can save time and energy for students and lecturers to lift and carry heavy panel wood. do you agree?	0%	10%	90%

The percentage of respondents' responses to the ten (10) survey questions regarding the trolley's effectiveness when employed in the wood workshop is displayed in Table 1. Forty (40) respondents, or over 90% of the sample, expressed how helpful they found the new trolley, particularly for carrying large and heavy panels throughout the wood workshop. However, 10% of respondents disagree with some aspects of the trolley, such as its size and design, indicating the need for further improvements. Twenty percent (20%) of the respondents were still unsure about how long the new trolley would last when used to its full potential in the workshop.

IV. CONCLUSION

The project had successfully produced a new trolley for PSA Wood Workshop. However, the size and design of the trolley should be considered in future work. An accurate design can improve and enhance the efficacy of material handling in the workshop.

ACKNOWLEDGEMENT

Special thanks to all Semester 5 Diploma in Wood Based Technology Programme students who are indirectly involved in this project.

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WOODY DECO

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ABSTRACT: This project produced is Woody Deco. Woody Deco is produced to deal with scrap wood found in the woodworking workshops of the Department of Civil Engineering, PSA. The materials used in this product are plywood and solid wood from scrap wood taken in the woodworking workshop of the Civil Engineering Department. The size of the wood used varies according to the suitability of the product produced. Therefore, we take the initiative in dealing with the problem of scrap wood in wood workshops by making it a useful product. The objective was to produce Woody Deco with plywood and solid wood from scrap wood. Meanwhile, other materials used are stapler guns, G or F clamps, PVAC glue, and sandpaper. The resulting WOODY DECO products are for those who like decor on the walls and something aesthetic.

and sawdust from all timber products. So, it will reuse the remaining wood scrap to produce a product to avoid increasing the quantity of wood waste in the wood workshop.

Decoration refers to the process of enhancing or beautifying something, typically an object, space, or environment, to make it more attractive, appealing, or visually pleasing. Decorations can take various forms, including ornaments, embellishments, patterns, colors, textures, and arrangements. They are often used in interior design, architecture, fashion, art, events, and celebrations to create ambiance, convey a theme or style, and evoke certain emotions or reactions. Decoration serves both aesthetic and functional purposes, adding personality, character, and visual interest to a space or object while also fulfilling practical needs or cultural significance.

I. INTRODUCTION

Scrap wood refers to leftover or unused pieces of wood that remain after completing a woodworking project or construction task. These pieces can vary in size, shape, and type of wood and may result from cutting, sawing, planning, or other woodworking processes. Scrap wood can include offcuts, trimmings, or pieces deemed too small or irregular for further use in the original project. While some scrap wood may be discarded as waste, it is often saved and repurposed for other purposes such as DIY projects, crafts, repairs, or smaller-scale woodworking tasks. Recycling or upcycling scrap wood helps reduce waste and can be a cost-effective way to utilize materials efficiently. Scrap Wood scrap is a production waste from sawmills, carpenters' workshops, or furniture factories and untreated wood offcuts from building sites. While wood waste refers to end-of-life products failed products, off-cuts, shavings,

II. METHODOLOGY

Woody Deco is a wall decoration product. The best design proceeds with material selection, material cost, and operating methodology will be shown also in this chapter to provide in-depth information about the product. Woody Deco is a product that uses wood scrap at the Wood Workshop Department of Civil Engineering, PSA.

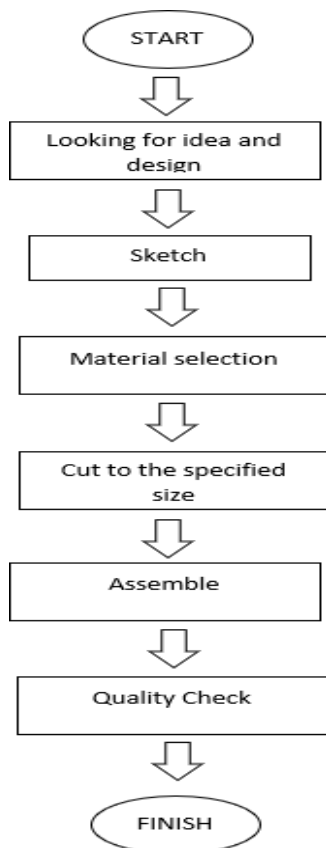


Figure 1: Project Flow Chart

III. RESULT AND ANALYSIS

In conclusion, the data collected through Google Forms underline the impressive agreement among respondents, especially on the design and color aspects of woody deco products made of scrap wood. Feedback reveals a consensus that these creations infuse the space with a sense of value and uniqueness, resonating deeply with individuals seeking distinctive woody deco solutions. Such findings not only confirm Woody Deco's enduring appeal but also highlight its ability to evoke deep connections with consumers. As we move forward, it is clear that prioritizing diverse design options and a rich color spectrum will further enhance Woody Deco's appeal and accessibility, ensuring its continued relevance in the field of interior design and beyond.



Figure 3.1: Woody Deco Hexagon



Figure 3.2: Woody Deco 3D Forest



Figure 3.3: Woody Deco Wave Concept

IV. CONCLUSION

Through this Project, Woody Deco offers a combination of aesthetics and creativity. It shows the potential to transform discarded materials into beautiful and functional decorative items while encouraging individuals to explore their creativity and contribute to a more sustainable future. All hope that the advantages of this product can bring benefits and convenience to the community. With the availability of this product, we hope that it will be able to deal with the problem of scrap wood in wood workshops and produce better products in the future.

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SELF-PHYSIO ARM (SEPHYA) INNOVATION FOR POST-STROKE PATIENT

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ABSTRACT: Self-Physio: Arm (SEPHYA) is a tool designed to ease self-therapy for stroke patients of all ages, thereby reducing post-stroke disability levels. Stroke patients often face challenges in scheduling therapy sessions at hospitals due to time constraints and limited availability. This creates difficulties for both patients and their families in accessing rehabilitation services. To address this problem, the Self-Physio Arm for Stroke was developed as a supplementary device that can be used at home during the post-stroke recovery process. SEPHYA utilises a wind pressure method as the actuator to support the patient's hand and offers four rehabilitation movement modes: left and right elbow movement, open and close palm movement, arms up and down, and a combination of palm movement modes at a comfortable speed for post-stroke patients. The device includes adjustable speed settings, allowing users to customise the movement speed according to their capabilities. The use of SEPHYA provides convenience and reduces the risk of further disability. Future enhancements may include adding more activities and games, improving balloon grading, adding wheels under the armrest for easier hand movement, and selecting better materials for the product.

Keywords: Stroke, Supplementary device, Rehabilitation

I. INTRODUCTION

In the 1970s, the World Health Organization defined a stroke as a neurological issue caused by blood vessel problems that lasts more than 24 hours or leads to death within that time.

The key risk factors of stroke patients are including old age, high blood pressure,

previous strokes or TIAs, diabetes, high cholesterol, smoking, and atrial fibrillation, with high blood pressure being the most significant modifiable risk factor (Nanda, 2024). Stroke survivors often have multiple dysfunctions which seriously affect their daily life, work and social communications (Chen et.al.,2020). Hemiplegia is a key symptom, often accompanied by visual problems, sensory loss (like numbness or tingling), and speech difficulties. These attacks are usually consistent, mainly occur in children or teenagers, may be triggered by minor head injuries, and rarely happen more than once a year. The hemiplegia affects the face, arm, and leg, and tends to last longer than the headache (J. Eric Piña- Garza,2013). The rehabilitation process for stroke remains unclear, making it a prominent focus of rehabilitation medicine research (Xuefei, H., & Yan, Y. (2021). Early rehabilitation intervention can significantly enhance neurological function for acute stroke patients (Xuefei, H., & Yan, Y. (2021). Intensive hand training can enhance upper limb motor function in stroke patients with hemiplegia, decrease the severity of their condition, and improve overall recovery outcomes (Gou et.al.,2022). The primary goal of this research is to develop a device that can aid patients in physiotherapy activities, therefore enhancing the quality of life for those with hemiplegia.

II. METHODOLOGY

The project aims to provide a functional and effective tool for individual suffering from Hemiplegia stroke. Before presenting initial design sketches, a thorough examination of various product concepts was conducted. After careful consideration, a stroke arm support was selected as the most suitable product.

To gain a deeper understanding of stroke and the needs of stroke survivors, extensive research was conducted. Online resources were utilized to gather information about stroke and its effects. NGOs, institutes, and rehabilitation centres specializing in stroke care were identified and contacted. Then, the Rehabilitation and Special Needs Study Centre (iCaReHab) at University Kebangsaan Malaysia (UKM) was selected as a significant resource to collaborate in this project by providing the valuable insights and opinions regarding the design and functionality of SEPHYA. The initial stages of the project involved concept selection, design development, and establishing a collaboration with iCaReHab. The next steps were focused on further refining the design, developing a prototype of SEPHYA and conducting product testing and validation process.

CONNECTOR PRINTING PROCESS

The connector printing process can be referred to Figure 1. These steps are outline with the workflow involved in designing, preparing, and executing the 3D printing of a connector using AutoCAD software and a 3D printer.

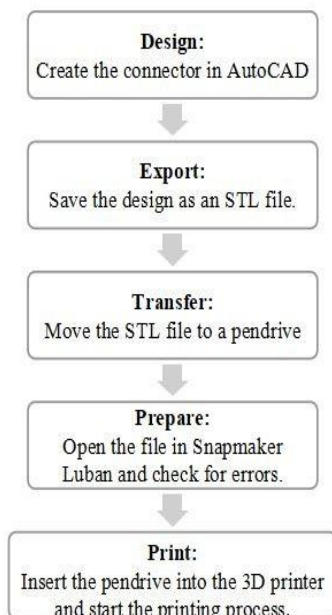
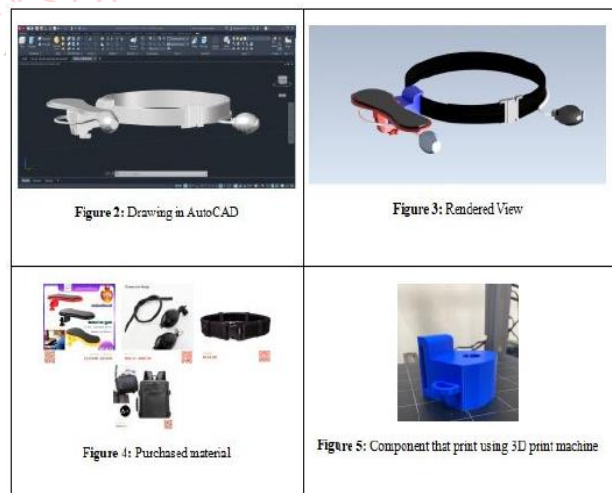


Figure 1: The steps involved in the connector printing process.

The process of 3D printing a connector begins with designing the connector in AutoCAD, a software used for creating both 2D and 3D models. Once the design is completed, it is saved in STL format, a standard file format for 3D printing that captures the surface geometry of the object. The STL file is then transferred to a USB drive for portability and moved to another computer connected to the 3D printer. Using Snapmaker Luban software, the position of the 3D model is checked and adjusted to ensure proper orientation and alignment before printing. After confirming that there are no errors in the design, the USB drive is safely ejected from the computer and inserted into the 3D printer. Finally, the file is opened in the 3D printer’s software, and the printing process is initiated, allowing the machine to create the connector based on the design. This sequence of steps outlines the complete workflow for designing, preparing, and executing the 3D printing of a connector using AutoCAD and a 3D printer.

PRODUCT MANUFACTURING

The attached pictures in Figs: 2 - 4 shows the design and material of each part used in the manufacture of (SEPHYA).



Figs: 2-4: The manufacturing process involved in SEPHYA product

PROTOTYPE TESTING AND VALIDATION

The prototype of the Self-Physio Arm (SEPHYA) was successfully manufactured, as shown in Figure 5. Product testing and validation were conducted at Pusat Kajian Rehabilitasi dan Keperluan Khas (iCaReHab) UKM, as seen in Figures 5-6.



Figure 5: The prototype of Self-Physio: Arm (SEPHYA)



Figure 6 (a) and (b): Testing and validation process of prototype.



Figure 7: Product testing to the patient at Jerantut, Pahang.

Upon completing the Self-Physio: Arm device, an efficacy test on the product was done on a patient with hemiplegia at Jerantut, Pahang, as shown in Figure 7.

III. FINDINGS AND DISCUSSION

PROTOTYPE OUTCOMES

The prototype has proven to be highly beneficial for users, offering significant advantages through its user-friendly design. The Self-Physio Arm (SEPHYA) is easily understood and operated by patients, their guardians, and nurses due to its straightforward installation and functionality. Despite its reliance on electronic components, the device's pneumatic system is essential for its effective performance. The

system operates by using an inflator bulb pump to extend the fingers, with the pump's valve automatically opening to allow air into the balloon, facilitating the finger movement. A physiological expert note that this method, which requires approximately one hour of daily use, is effective in restoring stroke victims' fingers to their original position.

PROTOTYPE FEEDBACK AND IMPROVEMENT

The device is simple to use and suitable for home application, making it ideal for hemiplegia patients. The intended functionality of the pneumatic system was successfully achieved, with the technique effectively inflating the balloon to extend the fingers using an inflator bulb pump. However, there are areas for improvement, including the addition of more activities and games, determining appropriate grading for the balloons, and adding wheels under the armrest to facilitate easier movement of the patient's hand.

IV. CONCLUSION

The Self-Physio Arm (SEPHYA) has exhibited substantial advantages due to its user-friendly design, which renders it accessible to patients, guardians, and nurses. The success of the device is mostly due to its pneumatic mechanism, which employs an inflatable bulb pump to stretch the fingers. Future improvements may include the incorporation of supplementary activities and games, the refining of balloon grading, the integration of wheels beneath the armrest to ease hand mobility, and the selection of materials for the product.

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BANANACOCO OSB

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ABSTRACT: Bananacoco OSB was developed to make Oriented Strand Board [OSB] from two agricultural waste material which are banana stems and coir and compared physical properties such as density testing and mechanical properties with two testing, tensile strength testing and water absorption. This project is waste of agricultural like banana stems and coir are one of the examples unused agricultural wastes and reduced timber resources. The methodology of this project is first step do particle drying. Second is cutting material and third addition of resin Urea Formaldehyde [UF] in 122.22g based on standard quantity. After that, put sample of OSB inside hot pressing machine about a 6 to 8 minutes and let it be cool a few minutes. The final step is cutting to reference standard British size 380mm x 380mm. The result of project makes Oriented Strand Board [OSB] for banana stem that showed reading of density testing is 60.71 kg/m^3 and reading of water absorption testing is 3% by follow standard Wood ASTM D570. While for coir OSB that showed reading of density testing is 5.15 kg/m^3 and reading of water absorption testing is 2% by follow standard Wood ASTM D570. The experiment of making banana stem OSB and coconut coir OSB with resin content 122.22g at average density 480 kg/m^3 – 550 kg/m^3 based on referring the British standard, there are achieved standard value.

Keywords: Oriented strand board, Agricultural waste, Timber resources, Physical properties, Urea Formaldehyde

I. INTRODUCTION

Oriented Strand Board (OSB), also known as flakeboard, sterling board and aspenite in British English, is a type of engineered wood similar to particle board, formed by adding adhesives and then compressing layers of wood strands (flakes) in specific orientations. It was invented by Armin Elmendorf in

California in 1963. OSB may have a rough and variegated surface with the individual strips of around $2.5 \text{ cm} \times 15 \text{ cm}$ (1.0 by 5.9 inches), lying unevenly across each other and comes in a variety of types and thicknesses. OSB is a material with favorable mechanical properties that make it particularly suitable for load-bearing applications in construction.

It is now more popular than plywood, mastered 66% of the structural panel market. The most common uses are as sheathing in walls, flooring, and roof decking. For exterior wall applications, panels are available with a radiant-barrier layer pre-laminated to one side, this easy installation and increases energy performance of the building envelope. OSB also been used use in furniture production.

II. METHODOLOGY

Methodology is defined as a systematic approach or the specific procedures or techniques to identify, select, and analyze information about the product. The flowchart is generally showed the process of making Bananacoco OSB. It serves as a guide to complete the works.

The fabrication process was done in lab composite as shown in figure 2.0. Testing way divided into 3 types of testing. First testing is density test and the second testing is water absorption test. The other testing is tensile strength.

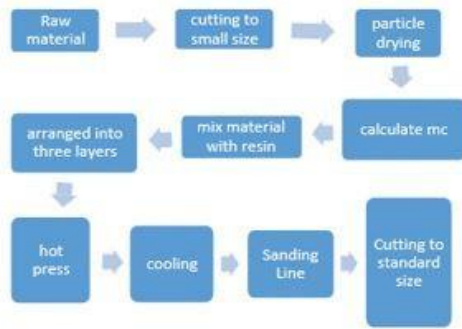


Figure 1.0: Flowchart the process of making Bananacoco OSB

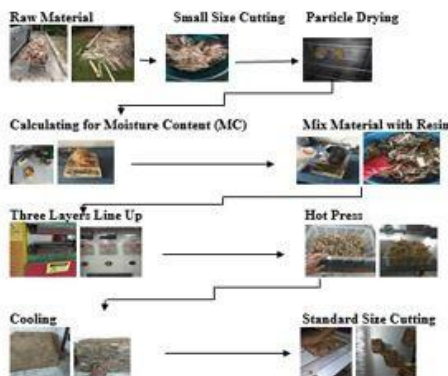


Figure 2.0: Fabrication process of Bananacoco OSB

III. RESULTS AND DISCUSSION

WATER ABSORPTION

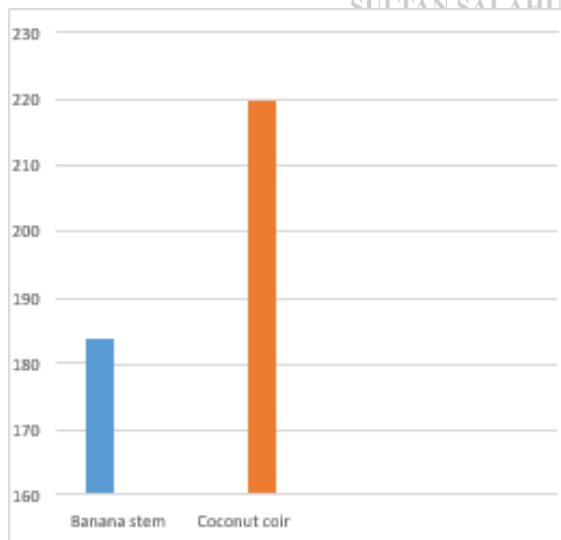


Figure 3.1: The Water Absorption Testing of Banana Stem OSB and Coconut Coir OSB

From the result, the water absorption for coconut coir OSB is higher than the banana stem OSB because the coconut coir OSB have hollows that can absorb more water,

compared with banana stem OSB which can absorb a small amount of water.

DENSITY TEST

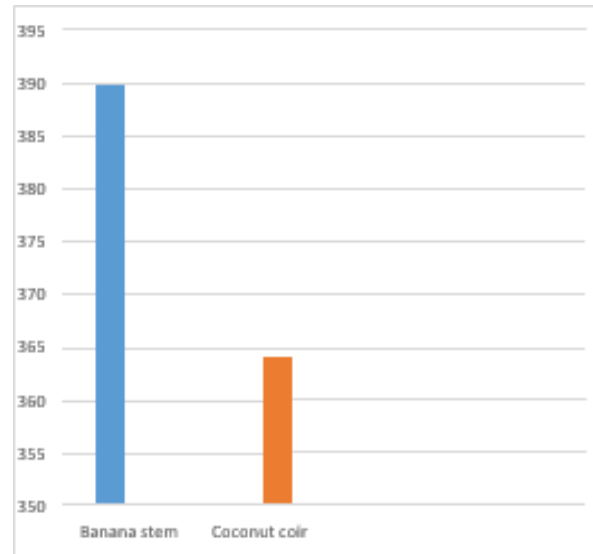


Figure 3.2: The Density Testing of Banana Stem OSB and Coconut Coir OSB

From the result, the density for banana stem OSB and coconut coir OSB have not achieved the value of standard but achieved on target density between 480kg/m³ until 550 kg/m³. The density of coconut coir OSB is lower than the banana stem OSB because the size of coconut coir very thin and fine, compared with banana stem that have big size.

TENSILE STRENGTH

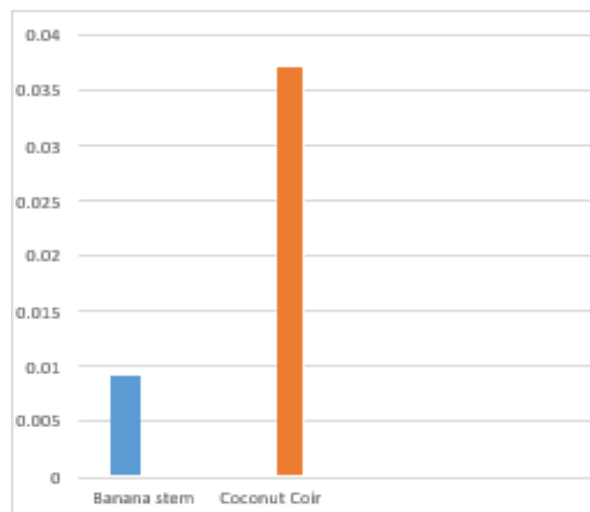


Figure 3.3: The Tensile Strength Testing of Banana Stem OSB and Coconut Coir OSB

From the result, the tensile strength for coconut coir OSB is higher than the banana stem OSB because the coconut coir OSB have high in reading water absorption. The coconut coir OSB is more flexible than the banana stem OSB.

IV. CONCLUSION

As conclusion, the experiment of making banana stem OSB and coconut coir OSB with resin content 122.22g at average density $480\text{kg/m}^3 - 550\text{kg/m}^3$ based on referring the British standard, there are achieved standard value. From the result water absorption testing, the coconut coir OSB have higher than the banana stem OSB because can absorb more water and not suitable for using outdoor place. The result from density testing, both of banana stem OSB and coconut coir OSB have not achieved the value of standard because poor density and less raw material or resin. Lastly, the result from tensile strength of coconut coir OSB have higher value than banana stem OSB because coconut coir more flexible with the thin size. For further this study, it is recommended to use difference quantity resin and raw material to ensure more details and make comparing sample with more testing to ensure the suitable product. Other recommendation is using difference agricultural waste to reduce the timber resources.

ACKNOWLEDGMENTS

I would like to offer our heartfelt gratitude to everyone who helped us. Thank you for outstanding co- researchers, Mr. Muhd Kamal Ariffin bin Hj Bandrun, for his recommendations and encouragement in assisting in this project, particularly during the drafting of development of this product. Last but not least, I would want to express gratitude to family, friends, and anybody else who helped us lead the team during this project by lending their support.

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PERSEPSI PELAJAR TERHADAP PENGGUNAAN E-TEXT NOTES DI DALAM SUBJEK DCW 20083 - WOOD CHEMICAL PROPERTIES

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ABSTRACT: "The back pain that women experienced duDi" dalam Program Diploma Teknologi Berasaskan Kayu (DBK), subjek DCW20083 – *Wood Chemical Properties* merupakan salah satu kursus teras di dalam kurikulum yang telah disediakan oleh Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK). Pelajar DBK akan mengambil kursus ini pada semester 2. Pencapaian pelajar terutama penguasaan pengetahuan yang berunsurkan subjek sains agak kurang memberangsangkan dan ianya perlulah ditambahbaik dari masa ke semasa. Bahan rujukan khusus seperti e-book dibuat sebagai usaha untuk meningkatkan pencapaian pelajar di dalam bidang akademik sebagai salah satu bahan rujukan pembelajaran digital. Kajian ini dijalankan dengan menggunakan borang soal selidik yang diberikan dalam bentuk goggle form serta diedarkan kepada pelajar-pelajar yang mengambil kursus DCW20083-*Wood Chemical Properties*. Dapatan kajian mendapati bahawa kandungan e-book yang disediakan adalah bersesuaian dengan tahap pelajar dan berjaya menarik minat pelajar dalam subjek berkenaan. Walaubagaimanapun, e-book yang telah dihasilkan masih perlu ditambahbaik lagi bagi menarik minat lebih ramai pelajar untuk menggunakannya sebagai salah satu bahan pembelajaran digital di masa hadapan.

Kata kunci: e-Book, Program Diploma Teknologi Berasaskan kayu (DBK), Pembelajaran Digital.

I. PENGENALAN

Subjek DCW20083-*Wood Chemical Properties* merupakan salah satu subjek yang ditawarkan kepada pelajar-pelajar program Diploma Teknologi Berasaskan Kayu (DBK)

pada semester 2 pengajian. Penggunaan nota secara atas talian seperti e-Text-Notes Series 1-*Distribution of Chemical Composition in the Cell Wall* ini diguna pakai bagi membantu pelajar menguasai terutamanya topik 1 di dalam subjek berkenaan.

Subjek ini lebih memfokuskan kepada pembelajaran berkaitan sifat kayu dari segi kandungan kimia organik yang terdapat di dalam setiap kategori spesies kayu yang mana kebiasaannya ia akan mempengaruhi kualiti produk akhir kayu yang dihasilkan. Projek ini juga turut menyelitikan unsur-unsur *Outcome Based Education* (OBE) selaras dengan visi Politeknik sebagai penyedia institusi TVET yang unggul bagi memenuhi keperluan tenaga kerja global menjelang 2020. Oleh itu, kekuatan pengetahuan di dalam subjek berkenaan amat diperlukan bagi membantu mereka sewaktu di alam pekerjaan sebenar khususnya di dalam industri perkayuan negara. Sehubungan dengan itu, penggunaan e-Text Notes berkenaan mula digunakan pada Sesi 2: 2022 / 2023. Persepsi pelajar terhadap penggunaan e-Text Notes ini telah dinilai pada akhir semester berkenaan. Penggunaan e-Text Notes ini juga telah dikongsi di dalam sistem Learning Management System (LMS), CIDOS sebagai rujukan kepada pelajar dalam mengulangkaji pelajaran secara sendiri yang melibatkan hanya topik 1 buat masa ini bagi membantu peningkatan pencapaian pelajar di dalam kuiz dan ujian yang dilaksanakan sebagai penilaian kerja kursus (PKK) sebagaimana yang telah digariskan mengikut kurikulum program Diploma Teknologi Berasaskan Kayu (DBK).

REFLEKSI MASALAH PENGAJARAN DAN PEMBELAJARAN YANG LEPAS

Idea inovasi pemudahcara pengajaran dan pembelajaran (PDP) ini dilaksanakan adalah berdasarkan kepada laporan Course Outcomes Review Report (CORR) bagi kursus DCW20083 – *Wood Chemical Properties* bagi Sesi 1: 2022 / 2023. Terbitnya cadangan ini adalah kerana pencapaian pelajar pada CLO1C (Kognitif) yang agak rendah berbanding dengan pencapaian pelajar pada CLO2P (Praktikal) dan CLO3A (Afektif). Pencapaian CLO1C yang rendah ini adalah sebahagiannya disumbangkan oleh pencapaian yang kurang memuaskan pada penilaian kuiz dan ujian yang telah dilaksanakan.

FOKUS KAJIAN DAN LIMITASI

Fokus kajian ini adalah penggunaan e-Text Notes Series 1–*Distribution of Chemical Composition in the Cell Wall* yang telah dihasilkan oleh pensyarah pada Semester 1 2022/2023 dan telah dikongsikan kepada pelajar di dalam LMS CIDOS pada Semester 2: 2022/2023 selama 14 minggu. Data kajian telah dikumpulkan pada akhir semester.

OBJEKTIF KAJIAN

Kajian ini bertujuan untuk melihat persepsi pelajar terhadap penggunaan e-text notes dan juga penambahbaikan terhadap e-book berkenaan

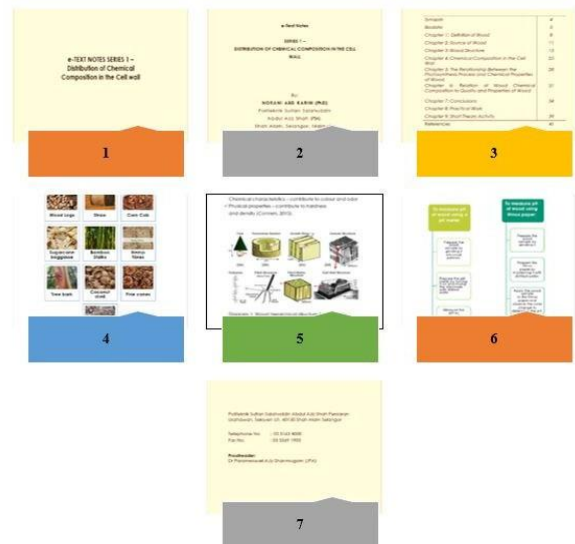
KUMPULAN SASARAN

Kumpulan sasaran yang terlibat di dalam soal-selidik ini adalah pelajar-pelajar Semester 2 DBK pada Sesi 2: 2022/2023.

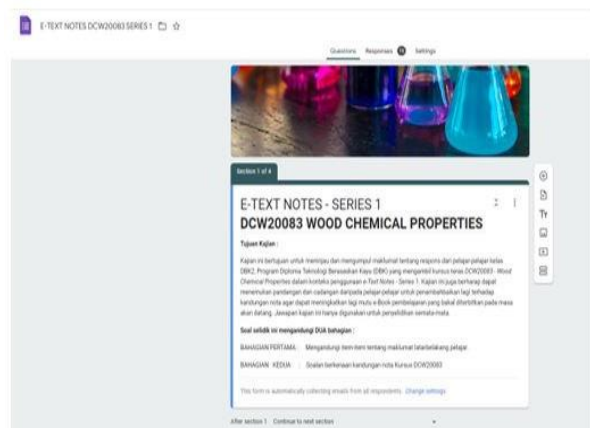
II. METODOLOGI KAJIAN

Kajian ini lebih kepada kajian kuantitatif dengan menggunakan borang soal selidik yang dibina melalui `Google Form` dan telah diedarkan kepada pelajar bagi mendapatkan maklumbalas terhadap penggunaan dan penambahbaikan terhadap e-book berkenaan. Soalan bagi soal selidik kajian ini dibina berdasarkan kepada tiga (3) bahagian utama iaitu (1) bahagian demografi, (2) perasaan responden terhadap pembelajaran subjek DCW20083-*Wood Chemical Properties* dan (3) kandungan nota e-book. Pembinaan soalan kajian ini telah mendapat ilham daripada

penyelidik lain berkenaan keberkesanan penggunaan buku teks di dalam Bahasa Cina (Hong, 2002). Borang *Google Form* ini telah diedarkan kepada 38 orang pelajar semester 2 DBK pada minggu ke 15 – 16 selepas berakhirnya minggu kuliah yang terakhir pada minggu ke-14. Pembinaan kandungan e-book telah mendapat idea hasil daripada rujukan dari Buku Garis Panduan Penghasilan E-Book terbitan Politeknik Sultan Salahuddin Abdul Aziz Shah (Masitah et.al, 2022). e-book yang telah dikongsi kepada pelajar di dalam LMS CIDOS boleh dilihat seperti di dalam gambarajah 1. Manakala, borang soal selidik (gambarajah 2) yang telah dikongsikan kepada pelajar di platform Telegram yang diwujudkan khas untuk subjek berkenaan di awal semester sebagai platform komunikasi pelajar dan pensyarah.



Gambarajah 1: Sebahagian kandungan e-nota yang telah ditulis oleh penyelidik.



Gambarajah 2: Borang *Google Form* yang digunakan di dalam kajian ini.

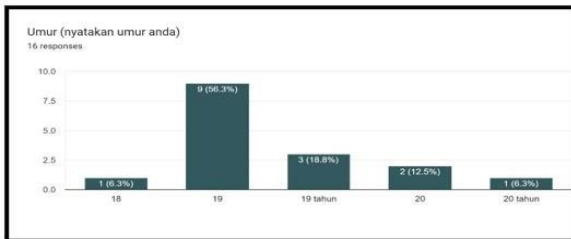
III. DAPATAN KAJIAN

Berdasarkan soal-selidik kajian yang telah diedarkan kepada 38 orang pelajar hanya 16 maklumbalas yang telah diterima daripada responden iaitu 42% sahaja daripada 38 orang pelajar yang telah disasarkan. Dapatan pada setiap soalan yang dikemukakan di dalam borang *Google Form* boleh dirujuk pada Gambarajah 3-14. Manakala, penambahan terhadap pembinaan e-Text Notes Series 1 – *Distribution of Chemical Composition in the Cell Wall* boleh didapati pada soalan terbuka (rujuk bahagian [d]) yang telah diberikan maklumbalas oleh responden).

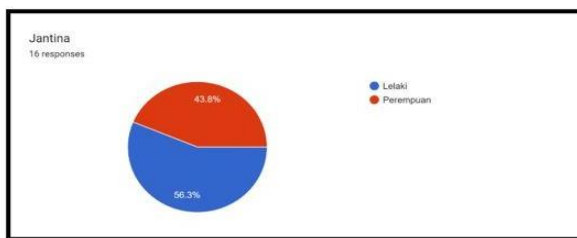
A. Bahagian Demographi



Gambarajah 3: Aliran yang diambil semasa di sekolah

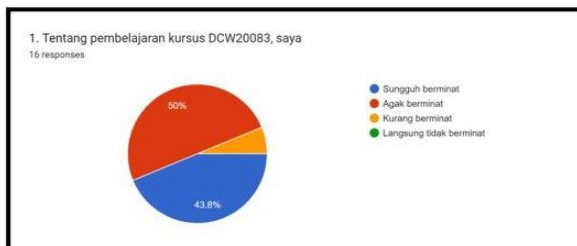


Gambarajah 4: Julat umur responden yang terlibat di dalam kajian ini.



Gambarajah 5: Jantina responden yang terlibat di dalam kajian ini.

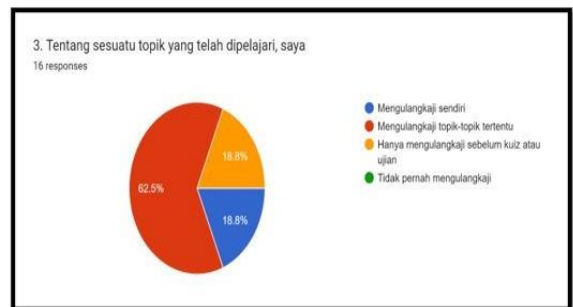
(b) Perasaan Terhadap Pembelajaran Kursus DCW20083 – Wood Chemical Properties.



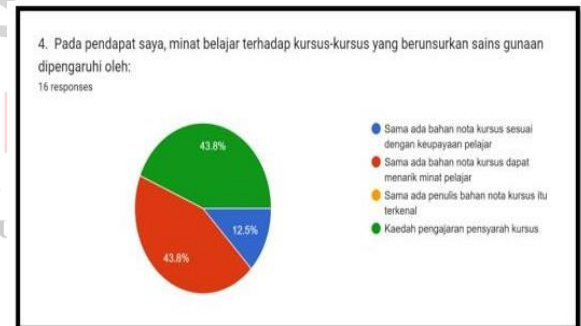
Gambarajah 6: Minat pelajar terhadap Kursus DCW20083 – Wood Chemical Properties.



Gambarajah 7: Trend responden terhadap pembelajaran sendiri.

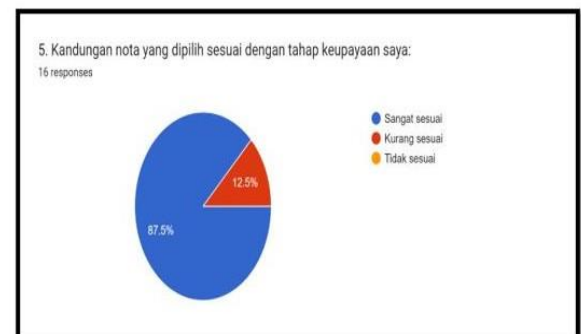


Gambarajah 8: Trend responden terhadap pembelajaran sesuatu topik.

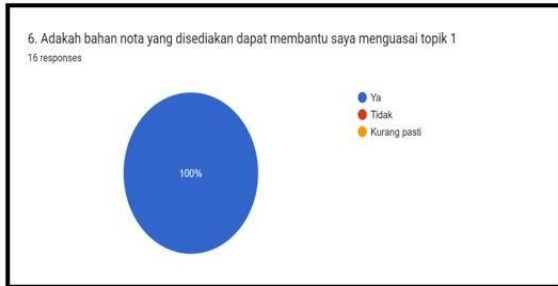
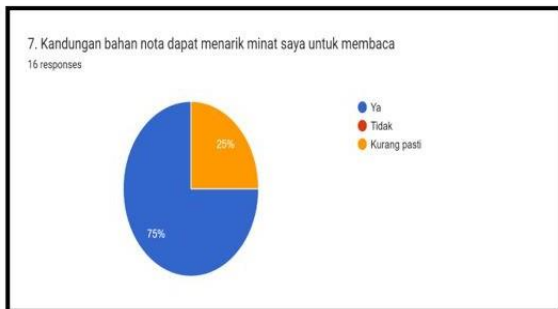
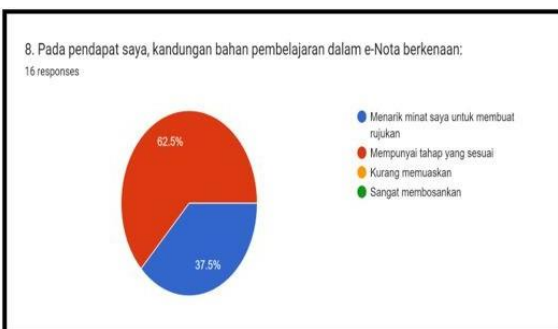


Gambarajah 9: Teknik dan bahan pengajaran PDP.

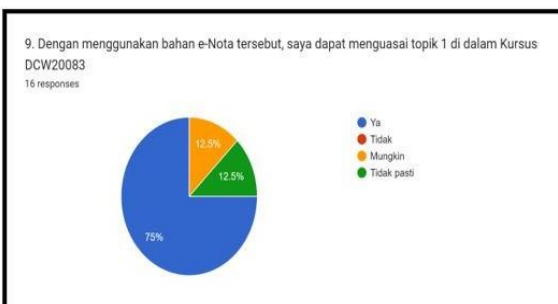
(C) Kandungan Nota Kursus



Gambarajah 10: Maklumbalas responden terhadap kandungan nota ebook.

Gambarajah 11: Maklumbalas responden terhadap pembinaan *e-book*.Gambarajah 12: Kesesuaian kandungan nota di dalam *e-book*.

Gambarajah 13: Kesesuaian kandungan nota yang boleh menarik minat responden.



Gambarajah 14: Maklumbalas responden terhadap kefahaman Topik 1.

SOALAN TERBUKA

Pada pandangan anda, nyatakan apakah perkara yang perlu ditambahbaik lagi jika ingin menyediakan e-Nota bagi topik-topik lain yang ada di dalam Kursus DCW20083 pada masa hadapan. Sepuluh (10) maklumbalas telah diterima untuk penambahbaikan terhadap e-Text Notes Series 1–*Distribution of Chemical Composition in the Cell Wall* adalah seperti berikut:

- Tambahan grafik dan gambar.
- Mengurangkan rumusan sebab bila terlalu banyak rumusan, perlu buat rujukan di sumber lain.
- Menggunakan media video sebagai penerangan (video animasi).
- Meletakkan gambar yang lebih jelas.
- Penerangan dalam gambar yang mudah difahami dan menggunakan perkataan yang mudah difahami serta mudah diingati.
- Menjadikan kandungan nota yang padat dalam bentuk peta minda supaya lebih mudah untuk dibaca dan difahami.
- Menambah gambar-gambar yang berkaitan dengan nota supaya nota nampak berwarna.
- Menggunakan peta *i-think*.

IV. PERBINCANGAN KAJIAN

Merujuk kepada gambarajah 3, didapati hanya 2 pelajar sahaja yang mempunyai latarbelakang bidang Sains dan ini menunjukkan bahawa kefahaman pelajar terhadap subjek DCW20083 – *Wood Chemical Properties* amat asing kepada sebahagian besar pelajar yang tidak pernah mengetahui berkenaan bidang perkayuan. Julat umur responden yang terlibat di dalam kajian ini adalah di antara 18–20 tahun (gambarajah 4). Jantina responden yang telah memberikan maklumbalas adalah seimbang (gambarajah 5). Masih terdapat 6.2% (gambarajah 6) pelajar merasakan mereka tidak berminat untuk mempelajari subjek ini. Dapatan ini menjadi cabaran besar kepada pensyarah untuk memikirkan teknik terbaik di dalam penyampaian kurikulum kepada para pelajar. Gambarajah 7 pula, lebih menunjukkan trend dan sikap pelajar terhadap proses pembelajaran sendiri. Hampir 70% responden hanya membuat persediaan sebelum sesi pembelajaran apabila ianya diperlukan sahaja.

Gambarajah 8 menunjukkan lebih 62% suka mengulangkaji pelajaran mengikut topik. Ini boleh disimpulkan bahawa idea pembinaan e-book mengikut topik amat menepati objektif pembinaan e-Text Notes Series 1– *Distribution of Chemical Composition in the Cell Wall*.

Kandungan nota kursus dan teknik pengajaran pensyarah dalam proses pengajaran dan pembelajaran (PDP) lebih menjadi dua unsur utama di dalam penyampaian sesuatu kurikulum (gambarajah 9). Lebih 80% responden bersetuju bahawa kandungan nota dalam e-book yang telah dihasilkan sesuai dengan tahap pemikiran responden (gambarajah 10). Keseluruhan responden amat bersetuju dengan bahan nota yang telah disediakan untuk mereka (gambarajah 11). Minat terhadap pembelajaran subjek DCW20083–*Wood Chemical Properties* terutama topik 1 telah berjaya ditingkatkan apabila wujudnya e-book berkenaan (gambarajah 12–13) serta bersesuaian dengan tahap pemikiran mereka. 75% responden pula berpandangan bahawa dengan adanya e-book berkenaan telah berjaya menambahkan kefahaman mereka terhadap topik 1 (gambarajah 14). Namun, masih terdapat beberapa penambahbaikan seperti yang dicadangkan oleh responden (rujuk maklumbalas pada para SOALAN TERBUKA) untuk diperbaiki oleh penyelidik sebelum e-book berkenaan diterbitkan pada masa hadapan.

V. KESIMPULAN

Secara keseluruhannya kajian ini amat membantu penyelidik/penulis bagi pembinaan kandungan e-book yang berkesan serta teknik pengajaran kepada pelajar perlulah ditambahbaik pada masa hadapan di dalam usaha memupuk minat pelajar generasi masa kini terhadap penguasaan dan minat terhadap subjek yang berunsurkan sains dan teknologi. Corak pembelajaran sendiri pelajar juga haruslah dipertingkatkan lagi terutama yang melibatkan proses pembelajaran secara digital.

PENGHARGAAN

Penulis ingin mengucapkan ribuan terima kasih kepada 16 orang pelajar DBK 2A Sesi 2: 2022/2023 yang telah memberikan maklumbalas dan meluangkan masa untuk menjawab soal-selidik ini.

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TAMA PASTE

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Nurul Hidayah Nasruya, Sarimah Che Hassan and Noordini Abdullah

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ABSTRACT: Since 2018, the disposal of eggshell waste has increased and reached 8.58 million metric tons in landfills and is not managed well. The effect can contribute to pollution such as water and air. The goal of this project is to develop a paste that can reduce eggshell waste by recycling eggshells into new products. The Design Thinking Method was used for this project. Eggshells are a rich source of calcium carbonate, that is difficult to decompose. Therefore, with this eggshell innovation, it can solve the issue of excessive food waste thrown into the environment and it will benefit the industry in several ways. In this study, we will concentrate on eggshells as food waste and investigate their utilization as a product that can benefit the industry in several ways. However, there is still need an improvement for the future. To confirm the product durability such as moldy or too difficult to form, further observation on the condition of the product in long period of time should be done.

Keywords: eggshells, paste, recycle, landfill, design thinking method

I. INTRODUCTION

Eggshells are waste that is disposed of in large quantities in Malaysia which is one of the biggest egg consumers in the world [1]. Based on a report issued by the Ministry of Domestic Trade and Consumer Affairs, Malaysians consume as many as 30 million chicken eggs a day or 930 million chicken eggs a month. At the global level, the consumption of chicken eggs also increased from 7651 million dozen in 2019 to more than 8000 dozen in 2020. The United States Department of Agriculture expects this figure to continue to increase by 2028 to 8917 million dozen [2]. Increased consumption and utilisation of chicken eggs worldwide results in an increase

in the amount of discarded egg waste, namely eggshell and eggshell membrane [3].

Malaysia is renowned for having excellent cuisine. We Malaysians are eager to boast about the variety and deliciousness of our cuisine because we are so proud of it. Sadly, our distinctive culinary culture has evolved into a culture of waste. According to Solid Waste Corporation of Malaysia (SW Corp) statistics, 15,000 tonnes of food were wasted every day in Malaysia in 2015, including 3,000 tonnes that were fit for consumption and shouldn't have been thrown away. According to the report, a household of five spends 210 USD on food on average each month, with 25% of that food going to waste during preparation, cooking, and consumption. Literally, 53 USD, or 631 USD per year, are thrown away every month. [4] Therefore, Tama Paste was created to address the issue of excessive food waste being disposed of in the environment. Remaining eggshells are finely pulverized and used to make this product. Tama Paste may be shaped into stationery, cosmetics, flowerpots, and other home décor items. This is because of its easy-to-work-with texture, which resembles clay. The main objective of this product is to develop a paste made from eggshells to reduce eggshell wastage. The scope of this project is to produce paste made from the eggshells and the capabilities and usefulness of Tama paste.

Tama Paste consists of two separate words. The first word is "Tama" which is an abbreviation of the word tamago, originating from the Japanese language, which means eggs. The second word, "Paste" is defined as a thick, soft, moist substance typically produced by mixing dry ingredients with a liquid. Hence, Tama Paste directly translates into "eggshell paste".

II METHODOLOGY

Based on the studies conducted by [5], design thinking is the term for the imaginative methods that designers use when they are designing. Design thinking is another method that can be utilized to think about problems and find solutions to issues outside the realm of professional design practice and has applicable to social and business concerns. It has been proven that adopting the Design Thinking Process as a framework in the design and development of the product is the most effective method to proceed with the project. We also used a questionnaire method by interviewing four respondents among Polytechnic Sultan Salahuddin Abdul Aziz Shah students and collecting their answers to know their feedback on our product and ways to improve our product. Figure 1 below shows Design Framework for this project.

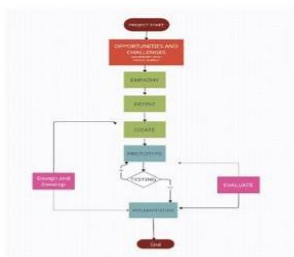
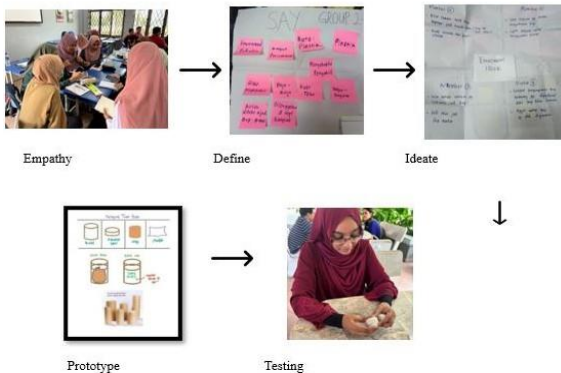


Figure 1: Project Design Framework



In study conducted in China, eggshell be seen used to treat and control soil pollution. In a study conducted in China in 2018, Eggshell powder is sprinkled on soil contaminated with heavy metals acting as a softening agent. The eggshell absorbs all the heavy metals and raises the pH of the soil. This is one of the ways to prevent plants from absorbing heavy metals and improve the quality of the crop. Prof. Gulden Camci-Unal and a group of researchers from the University

of Massachusetts Lowell have developed hydrogel technology created from eggshells to speed up the healing process of bone injuries. [6]

This is proof of the widespread use of eggshells in various matters, which are not only safe for the environment, but can also reduce the dumping of eggshells.

III RESULTS AND DISCUSSION

Table 1 below shows the profile of respondents for this project. We distributed online surveys to members of the public and collected their responses. These behavioural questions are intended to assess respondents' capacity to retain information. The table shows the differences in the demographics of the respondents such as gender, age and education level.

Table 1: Profile of Respondents

Demographic	Category	Frequency	Percentage
Gender	Male	9	27.3%
	Female	24	72.7%
Age	20 and below	15	45.5%
	21-30	12	39.4%
	41-50	3	9.1%
	51 and above	2	6.1%
Education Level	High School/SPM	10	30.3%
	Undergraduate (Certificate/Diploma/Degree)	21	63.3%
	Postgraduate (Master/PhD)	2	6.1%

Sample profile of analysis shows a higher number of female 72.7% (24) respondents than male 27.3% (9). Looking to the age group, 45.5% of the respondents are from the ages 20 and below, 39.4% are between the ages of 21 to 30, 9.1% are between the ages of 41 to 50 and 6.1% are from the ages of 51 and above. Finally, in terms of educational level, 30.3% of respondents are still in high school or have an SPM certificate, and 63.6% of them are undergraduates and the remaining are Postgraduates.

A descriptive statistic was employed to generally provide a description of the data. The percentage of respondents' responses to the six (6) questions regarding the Tama Paste is displayed in Table 2 The results in Table 2 illustrate that respondents agree that they are concerned about the waste generated from eggshells in general, by adding up agree and total agree (42.4%). The respondents agree that Tama Paste is environmentally friendly and sustainable. (75.8%).

They are also agreed to recommend Tama Paste to their friends and family (66.7%). 63.7% agree that Tama Paste exhibits greater durability compared to other pastes on the market. 78.8% agree that Tam Paste exhibits flexibility and can be used to create a wide variety of alternative items. Tama Paste has high market potential, according to 75.8% of respondents.

Table 2: Descriptive statistics for TAMA PASTE

Category	Rate	Frequency	Percentage
I am very concerned about the waste generated from eggshells	Totally Disagree	1	3%
	Disagree	2	2%
	Neutral	16	48.5%
	Agree	8	24.2%
	Totally Agree	6	18.2%
I find it important that Tama Paste is environmentally friendly and sustainable	Totally Disagree	0	0%
	Disagree	2	6.1%
	Neutral	6	18.2%
	Agree	13	39.4%
	Totally Agree	12	36.4%
I will recommend Tama Paste to my friends and family	Totally Disagree	0	0%
	Disagree	0	0%
	Neutral	11	33.3%
	Agree	12	36.4%
	Totally Agree	10	30.3%
Compared to other pastes on the market, Tama Paste exhibits greater durability	Totally Disagree	0	0%
	Disagree	1	3%
	Neutral	11	33.3%
	Agree	13	39.4%
	Totally Agree	8	24.2%
Tama Paste exhibits flexibility and can be used to create a wide variety of alternative items	Totally Disagree	0	0%
	Disagree	2	6.1%
	Neutral	5	15.2%
	Agree	15	45.5%
	Totally Agree	11	33.3%
Tama Paste has high potential in the market	Totally Disagree	0	0%
	Disagree	0	0%
	Neutral	8	24.2%
	Agree	13	39.4%
	Totally Agree	12	36.4%

IV. CONCLUSION

The project had successfully produced the Tama Paste. however, there is still need an improvement for the future. To confirm the product durability such as moldy or too difficult to form, further observation on the condition of the product in long period of time should be done.

ACKNOWLEDGEMENT

We would like to take this opportunity to express our heartfelt appreciation to all those who have contributed to the successful completion of this project. Their unwavering support, guidance, and encouragement have played a significant role in making this project a reality. Firstly, we would like to express our deepest gratitude to our lecturer on the subject, Dr. Noordini Abdullah for her invaluable patience and feedback during the making of this project. Additionally, this

endeavor would not have been possible without the generous support from our supervisor, Mdm Sarimah Che Hassan for insightful discussions and her mentorship throughout the project journey. Working together with Dr. Noordini Abdullah and Mdm Sarimah Che Hassan have not only enriched the project experience but also broadened our perspective on the subject matter making it easier for us to make and completion of this project.

We would also like to acknowledge the assistance and cooperation of our classmates who have provided valuable input, brainstorming sessions, and collaboration during various stages of this project. Their diverse perspectives, active participation, and shared enthusiasm have made the project journey enriching and enjoyable.

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SAFETY KEYCHAIN WITH CONCEALING DESIGN

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ABSTRACT: The project aims to improve personal safety for females in Malaysia by creating an affordable, multifunctional safety device with concealed features, intuitive operation, and covert alert. The design thinking methodology has been used to develop safety product that improve product availability, durability, and affordability. Collaboration with law enforcement will enhance emergency notifications. The project supports SDG-16, peace, justice, and strong institutions. The results revealed that this kind of product is hardly can be seen in the market and suggested that the product to be louder, lighter, and smaller in size. It implied that there is room for improvement. Intangible solution such as instill security and confidence, enabling females to pursue their ambition without barriers.

Keywords: Safety, Self-defence, Concealed, Multifunctional.

I. INTRODUCTION

Today, crime cases have become more and more threatening which led to various issues concerning students, especially females. From minor crime such as snatching, and more major crime like harassment are examples of issues that occurred to many. Our lives have become increasingly hurried these days. To be a part of this fast-paced world, women must work hard to live and support their families. They work in a variety of settings, including IT organisations, call centres, and many more. The call centre jobs are set to start late at night. They must return home late at night after completing their duties, thus anything can happen at such times, and there is a risk of harassment in isolated areas (Ashlesha, Velankar and Priyanka 2015).

As illustrated by recent cases, the contemporary environment of personal safety is marked by serious issues. According to an article in The Star on May 15, 2023, Serdang, sexual crime cases involving underage children in the state have increased in the last four months, according to the Selangor police head. Datuk Hussein Omar Khan, COMM, during the opening of the Seri Kembangan police station hall on Monday. He claimed that the police investigated 155 cases in the last four months. Among the reported cases was statutory rape, in which Comm Hussein stated that at least 33 suspects were still students. While Comm Hussein did not have exact figures compared to last year, he stated that the number of cases was worrying.

A recent survey of almost 16,000 people in the United States found that one in every five women is raped in their lifetime, compared to one in every 71 males, and that one in every three women was raped in the year preceding the survey. 9 Women reporting sexual assault in large cities reveal rates of 15% in Canada, 22% in Nicaragua, 23% in England, and 25% in Zimbabwe; women reporting physical assault include 22.1 percent in the US, 29.0% in Canada, and 34.4 percent in Egypt (World Health Organization, "World Report on Violence and Health," 2002). Given this threat of violence, a portable system that may be readily carried by women is intended for this purpose.

II. METHODOLOGY

The methodology for this business project is strategically designed to employ the Design Thinking process, incorporating systematic approaches and research techniques. The project design integrates the five stages and three phases of the Design Thinking process, coupled with quantitative

research methods such as distributing questionnaires. The flow chart of design framework (Figure 2.0) visually represents the progression of the project, and the inventor delve into opportunities and challenges, recognizing the potential in creating a convenient, reasonably priced safety keychain. The methodological procedure follows the Design Thinking stages—Empathy, Define, Ideate, Prototype, and Test—carefully outlined to facilitate the accurate and presentable development of the Anjeon Keychain. Empathy involves gathering insights on students' safety concerns, defining interprets these findings, and ideation leads to the selection of a practical idea: a safety keychain with GPS tracker, pepper spray, and alarm beep functionalities. This methodology ensures a meticulous and innovative process in developing a safety product that addresses the unique challenges faced by students, especially females.

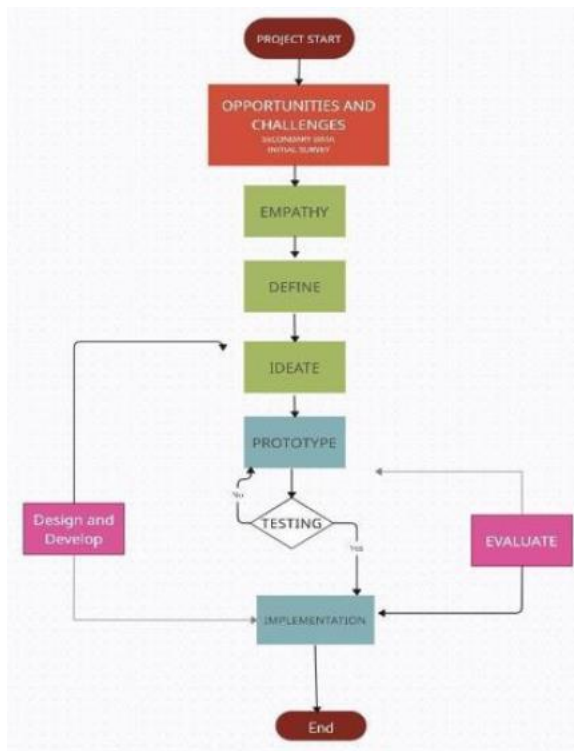


Figure 2.0: Flowchart design framework

III. RESULTS & ANALYSIS

The descriptive statistics of the items question is given in Table 1 below. The table shows the percentage and level of agreement for each item regarding product Anjeon Keychain.

No	Item	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean
1	The disguised design of the ANJEON KEYCHAIN is effective in blending with everyday items, providing inconspicuous carry for female students.	0	3	5	41	51	4.41
2	The multifunctional integration of features, including GPS, pepper spray, and alarm, enhances the overall effectiveness of the ANJEON KEYCHAIN.	0	0	16	41	43	4.27
3	ANJEON KEYCHAIN is an item that you can bring anywhere and anytime without causing any inconvenience to the user.	0	0	11	46	43	4.32
4	The affordability of the ANJEON KEYCHAIN makes it accessible to a wide range of users, contributing to its overall value.	0	0	8	51	41	4.32
5	The covert emergency notification system effectively alerts others without compromising the safety of the user.	0	0	8	57	35	4.27
6	ANJEON KEYCHAIN is an item that can help you keep your mind at ease anytime you're outside.	3	3	14	46	38	4.19
7	The intuitive operation of the ANJEON KEYCHAIN ensures quick and stress-free activation, even in emergency situations.	0	0	9	51	44	4.27
8	I would recommend the ANJEON KEYCHAIN to others as a reliable personal safety tool.	0	0	16	46	38	4.22
9	I've never seen this kind of product in the market before.	0	5	29	27	39	4.03

The following is the amount of respondents' responses to the nine item questions regarding the Anjeon Keychain's performance as self-defense-item as displayed in Table 1.

- (a). Question 1 has the highest percentage of respondents strongly agree (51%) with the statement of the disguise design.
- (b). Both Question 2 and Question 3 shows 43% strongly agree with the statement on the multifunctional integration of features and convenience.
- (c). Questions 4 shows 41% strongly agree with the statements on affordability.
- (d). Question 5 has the highest percentage of respondents choosing 'Agree' (57%), closely followed by 'Strongly Agree' (35.1%). Respondents agree Anjeon Keychain has covert emergency notification system effectively alerts others without compromising the safety of the user.

- (e). The respondents agree to recommend the ANJEON KEYCHAIN to others as a reliable personal safety tool. This is based on Question 8 which shows feedback of 46% agree and 38% strongly agree of the respondents.
- (f). Question 9 has a balanced distribution across the response categories, with the highest percentage in 'Neutral' (27%) and 'Strongly Agree' (41%) that they have never see this kind of product in the market before.

Overall, the level of agreement based on mean of all items is above 4.00 which shows that the respondent agrees with the credibility of the product.

IV. CONCLUSION

Overall, the research showed that people, especially women, reacted very positively to the Anjeon keychain as a security tool, proving that beautiful and cute security design can not only confuse the bad guys but also increase the purchase intention of female users. Purchase intention is particularly high and the price is competitive, suggesting that the target price of RM50 will optimize market penetration. Additionally, acknowledging different user groups and exploring different designs tailored for both genders can broaden a product's appeal and usefulness. The potential market appears to be large, providing opportunities to contribute to the achievement of SDG 16 Peace, Justice and Strong Institutions by fostering security awareness. Future iterations of the Anjeon keychain could prioritize compactness, lightweight construction, and enhanced alarm functionality. Introducing diverse designs, including options that appeal to both men and women, will cater to a wider audience, with cartoon designs being a good choice. Explore the use of sustainable materials, not only to reduce costs (bottles, cups used by others), but also to meet environmental considerations. At its core, Anjeon keychains are a combination of versatile self-defense products and everyday items, with cute or beautiful design solutions, constantly evolving to realize their full potential in protecting individuals and promoting safer communities.

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UNEE-T APPLICATION FOR VOLUNTEERING

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ABSTRACT: Volunteering encompasses sincerely and voluntarily planned activities, programs, or services. Organizations seeking volunteers allocate resources to manage and publicize these activities, yet potential volunteers often struggle to find suitable registration platforms. This project aims to address this gap by employing the design thinking method to design and develop an application facilitating the promotion and registration of volunteering programs. The application promises time efficiency and convenience, enabling individuals to join volunteering activities at their fingertips, anytime and anywhere. As the public increasingly adopts volunteering applications, a volunteer surge is expected, resulting in a significant positive impact on individuals, communities, and society. Through a post-survey conducted among 35 extreme users, a mean of 4.54 shows that volunteers' mobile application helps them to search and join volunteering activities. In contrast, the same mean value of 4.54 shows that volunteers will download and use this application to join volunteering activities in the future. This aligns with the nation's agenda to cultivate volunteerism, particularly among the youth, as Prime Minister Anwar Ibrahim stated in the 2024 budget allocation.

Through ongoing enhancements to features and reliability, the goal is for the application to evolve into a centralized mobile platform for volunteering. Mobile applications designed to facilitate volunteering can significantly impact various Sustainable Development Goals (SDGs) by enabling individuals to contribute to and engage with causes that align with these goals. Unee-T aligns with SDG 2: Zero Hunger by highlighting volunteer opportunities in food distribution networks, community farms, and nutrition education programs. Through the app, volunteers can sign up for shifts at food

banks or participate in community garden projects to help grow food for those in need. The UNEE-T application has demonstrated significant potential in enhancing volunteer engagement and streamlining the process of finding and participating in volunteer activities.

However, to fully realize its potential and address existing limitations, several steps and future directions should be considered. First, about user feedback Integration, the application should continuously integrate user feedback to refine and enhance its features. Collecting and analyzing user feedback will help identify areas for improvement, such as interface design, feature functionality, and overall user experience. Regular updates based on user suggestions will ensure the application remains relevant and user-friendly. Second for the next phase can include geographic expansion, while initially focused on a specific region or demographic, the app should aim for geographic expansion to serve a larger population. This could involve scaling the platform to different regions or countries, adapting to local needs and regulations.

Keywords: Volunteerism, applications, youth, volunteer

I. INTRODUCTION

Volunteerism has historically been vital in addressing global challenges such as climate disasters, diseases, and poverty. It involves mobilizing people to support noble causes, positively impacting both crisis moments and stable periods. Organizations, especially non-profits, heavily rely on volunteers. As we move into a new decade, there is a growing need to engage a wider range of volunteers, particularly among the youth. However, obstacles arise when volunteers

struggle to access information about opportunities or lack exposure to the latest programs. The community does not have a platform to inform the public of their problems and urgent needs in real time [1]. It is difficult to know their situation whenever an emergency happens. Streamlining this process is essential to make it easy for volunteers to discover and join suitable opportunities. While they enable interaction between people and services at any time and place, mobile devices are frequently used. It is simpler to stay informed about recent news that requires assistance, such as earthquakes, floods, and homelessness, thanks to smartphone apps.

But in this day of globalization, when everyone in the community is busy and there is no financial compensation for the labor, it can be difficult to maintain the volunteer group after the project has served its purpose. Therefore, it is not feasible for the administrative organization to oversee volunteer activities since it demands a constant budget and resources despite the fact that volunteering is a seasonal activity with a wide range of focal areas. The best approach is to write job descriptions for volunteer roles in order to specify the duties that volunteers must perform and the reasons why they are needed [2]. The integration of technology into volunteer management has streamlined various processes, making it easier for organizations to coordinate and engage volunteers. A comprehensive review by McBride and Martinez (2023) highlights how digital platforms have evolved to support volunteer management by offering tools for scheduling, communication, and impact tracking [3]. These advancements address many inefficiencies associated with traditional volunteer management systems, such as manual sign-ups and limited outreach capabilities. In a final survey conducted for our volunteer mobile application, a mean of 4.54 agrees that this volunteer mobile application helps them to search and join volunteering activities and the same mean value of 4.54 agrees to download and use this application to join volunteering activities in the future. The purpose of this application is to create a user-friendly platform enabling volunteers to effortlessly access and engage in various volunteering activities. Mobile

applications have revolutionized how individuals access and participate in volunteer opportunities. A study by Lee et al. (2023) explores how mobile platforms facilitate volunteer engagement by providing real-time information and seamless registration processes [3]. The study highlights that mobile applications not only increase accessibility but also enhance the efficiency of volunteer matching, enabling users to find and engage in activities that match their interests and availability [4]. Our goal is to design an application that promotes and facilitates registration for volunteering programs. Additionally, we aim to assess the application's utilization among volunteers and various organizations.

II METHODOLOGY

The Design Thinking Process was used to design the product in this project. In the study by Dam, Rikke Friis; Siang, Teo Yu, 2022 [5] using design thinking to determine empathy with interview methods and distributing questionnaires. For our project the first phase which is empathy, it was done by interviewing and handing out questionnaires to students, lecturers, and staff at Polytechnic Sultan Salahuddin Abdul Aziz Shah (PSA) to fully empathize with the issue. Then in the defining phase, we compiled all the information from various sources, including PSA personnel, lecturers, and students.

Next in the third phase which is ideate, we used brainstorming to look for solutions. To provide a solution for individuals impacted, we looked at a variety of approaches. After breaking down our ideas, we developed a prototype to bring these concepts to reality in the prototype phase. In addition, a qualitative research methodology was used to create our product. For this purpose, a pre-survey questionnaire was given to 34 participants, and the results were gathered to determine the respondents' opinions of the product. A final survey was also conducted among 35 extreme users after the usage of this volunteering mobile application. The Impact of Digital Tools on Volunteer Management. *Journal of Nonprofit Technology* [6]. The process of design thinking is as shown in Figure 1.

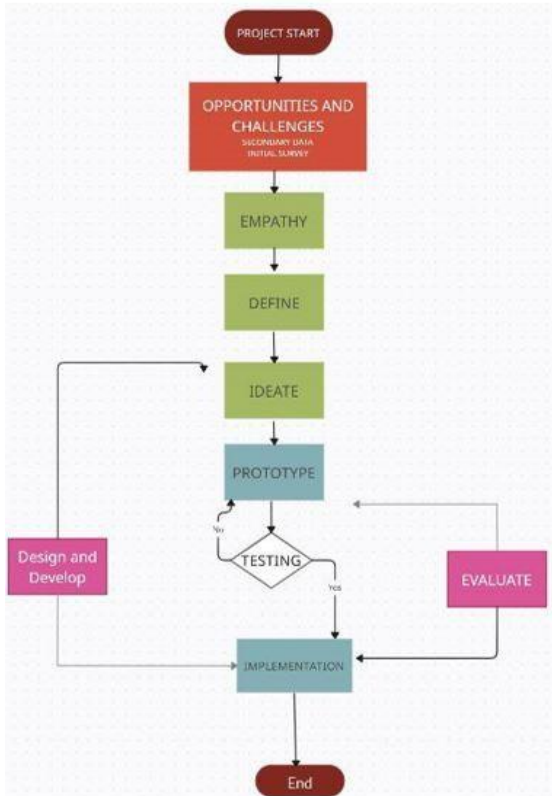


Figure 1: Design Thinking Process

III RESULT AND ANALYSIS

Based on data we received from distributed pre-survey questionnaires responded by the students, lecturers, and teachers that are also a community involved with volunteer activities. We can finalize the development of the volunteering mobile application. After implementing the usage of the application among extreme users, it indicates that the users are satisfied with the UNEE-T Application with improvements to be made from the suggestion given. A mobile matching prototype that enables volunteer activities based on location and psychological characteristics was proposed by Chen et al., n.d. 2011 [7]. However, they did not demonstrate any volunteer-based skills, knowledge, or experience. Mobile devices are frequently used, since they enable interaction between people and services anywhere, anytime. With smartphone apps, it is simpler to stay informed about breaking news that calls for assistance, such as floods, earthquakes, and homeless individuals. Studies carried out in several nations indicate positive developments and acceptance

among users, particularly university students. For instance, Fletcher, 2003 [8] found that in the United Kingdom, students enthusiastically endorsed the use of smartphones and mobile applications for instruction and administration at universities. It is greatly aided by the smartphone's capacity to access the Internet, which makes many users more passionate about utilizing smartphones to search for and get information. Several successful volunteering applications serve as case studies for understanding best practices in this field. The research by Ahmed and Siddiqui (2023) on the "VolunteerMatch" application showcases how features such as location-based search, user reviews, and integration with social media platforms can enhance user engagement and satisfaction [9]. Similarly, the study by Patel and Kumar (2024) on "GiveBack" illustrates the importance of integrating features that align with users' values and interests, such as opportunities to support specific causes or communities [10].

Do you think it is helpful to have volunteer mobile phone applications?
34 responses



Figure 2: Pre-Survey Result



Figure 3: Interface of UNEE-T

Statement	Mean	Standard Deviation
This volunteer's mobile application helps me to search for and join volunteering activities.	4.54	0.505
This volunteer's mobile application has a user-friendly interface.	4.51	0.562
This volunteer's mobile application has an attractive design.	4.40	0.695
This volunteer's mobile application is easy to navigate.	4.46	0.561
I will download and use this application to join volunteering activities in the future.	4.54	0.657
I am satisfied with the various features and functions in this volunteer's mobile application	4.09	0.781
The interface of this volunteer's mobile application needs improvement	3.83	0.923
The accessibility of this volunteer's mobile application needs improvement.	3.86	0.879
The features of this volunteer's mobile application need improvement.	3.77	0.843

Table 1: Post-Survey Results

IV CONCLUSION

In summary of our project, we have identified limitations and formulated recommendations during the research process. Additionally, the culmination of our efforts resulted in the complete development of a volunteering mobile application called UNEE-T, which has a significant impact on society as a whole. UNEE-T effectively addresses prior challenges encountered by volunteers and organizations. The feedback obtained from the respondents is highly positive indicating the benefits that this application has brought to the users. Going forward, volunteers can seamlessly participate in volunteering activities through

their mobile phone anytime and anywhere, at one single platform with continuous publication of volunteering activities by the organizers.

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PEMBANGUNAN “INTERIOR DESIGN CAPSULE (ID’S CAPSULE)” UNTUK PELAJAR SIJIL REKABENTUK DALAMAN KOLEJ KOMUNITI MALAYSIA

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ABSTRAK: Interior Design Capsule (ID’s Capsule) adalah aplikasi digital yang direka khusus untuk pelajar Kursus Sijil Rekabentuk Dalaman, Kolej Komuniti Malaysia bertujuan untuk menyediakan rujukan komprehensif dalam proses reka bentuk dan meningkatkan pemahaman serta pengajaran dalam perancangan ruang kediaman, pejabat, dan runcit. Asas kajian ini adalah keperluan mendalam untuk sumber pendidikan yang bersepadu dan mudah diakses dalam bidang rekabentuk dalaman. Masalah utama yang dikenalpasti adalah kekurangan aplikasi digital yang menyatukan semua konsep penting rekabentuk dalaman dalam satu platform yang interaktif dan mudah diakses. Objektif Interior Design Capsule adalah untuk menyediakan platform digital yang menyokong proses pembelajaran dengan menawarkan maklumat lengkap mengenai pengenalan reka bentuk dalaman, prinsip reka bentuk, perancangan ruang, teori warna, pencahayaan, tekstur dan bahan, perabot dan aksesori, elemen senibina, gaya reka bentuk, serta kepelbagaian dan trend. Metodologi yang digunakan termasuk kajian literatur dan penilaian keperluan, perancangan dan reka bentuk, pembangunan dan pengkodan, ujian dan penilaian serta pelancaran dan pengurusan aplikasi. Impak dari aplikasi ini termasuk peningkatan pemahaman pelajar, sokongan kepada pensyarah, pengayaan pengalaman pembelajaran, pengurangan jurang pengetahuan, penambahbaikan proses pengajaran dan pembelajaran dan adaptasi kepada era digital. Penambahbaikan yang dicadangkan termasuk penambahan modul interaktif yang lebih terperinci, peningkatan antara muka pengguna dan integrasi ciri-ciri terbaru berdasarkan maklum balas

pengguna. Kesimpulannya Interior Design Capsule diharapkan dapat memenuhi keperluan pendidikan dalam bidang rekabentuk dalaman dengan menyediakan platform yang lengkap dan interaktif. Aplikasi ini berpotensi untuk memperbaiki proses pengajaran dan pembelajaran, menyokong kejayaan akademik pelajar, dan mengadaptasi kepada perkembangan teknologi pendidikan moden.

Kata Kunci: Interior Design Capsule, Rekabentuk Dalaman, Aplikasi Digital

I. PENGENALAN

Interior Design Capsule adalah aplikasi digital yang direka khusus untuk pelajar Kursus Sijil Rekabentuk Dalaman, Kolej Komuniti Malaysia. Maureen Mitton, Courtney Nystuen (2021) menyatakan bahawa aplikasi pendigitalan adalah bertujuan sebagai rujukan dalam proses reka bentuk dalaman, boleh membantu dalam pengajaran dan pemahaman perancangan ruang kediaman, pejabat dan runcit.

Rosemary Kilmer, W. Otie Kilmer (2024) menyatakan rekabentuk dalaman adalah salah satu profesion yang paling menarik dan kreatif. Gabungan seni, sains, dan teknologi, rekabentuk dalaman dalam amalan memanipulasi ruang, bentuk, tekstur, warna dan cahaya untuk meningkatkan kualiti kehidupan manusia.

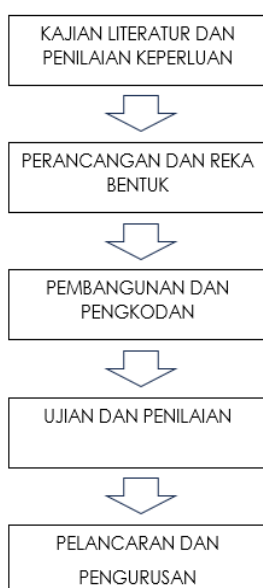
Menurut kepada Choirinisa, A. A., & Ikhwan, K. (2022), dalam era 4.0 banyak institusi telah beralih kepada penggunaan pendigitalan untuk tujuan pembelajaran, melaksanakan aplikasi digital yang bertujuan memudahkan proses pembelajaran bagi

individu yang terlibat. Terdapat kekurangan aplikasi digital yang mampu menyatukan semua konsep penting rekabentuk dalaman dalam satu platform yang mudah diakses dan interaktif.

Objektif utama Interior Design Capsule adalah untuk menyediakan platform digital yang menyokong dan memperkayakan proses pembelajaran dalam bidang rekabentuk dalaman. Aplikasi ini bertujuan untuk memudahkan pelajar memahami prinsip-prinsip asas rekabentuk dalaman melalui rujukan yang lengkap mengenai perancangan ruang kediaman, pejabat, dan runcit. Selain itu, Interior Design Capsule bertujuan untuk meningkatkan pembelajaran interaktif dengan menggunakan pendekatan digital yang mendorong keterlibatan aktif pelajar dalam konsep-konsep rekabentuk dalaman. Dengan menawarkan alat yang berguna bagi pensyarah dalam menyampaikan maklumat secara berkesan, aplikasi ini diharapkan dapat mempermudah proses pengajaran dan pembelajaran serta membantu pelajar mencapai kejayaan akademik dalam bidang ini.

II. METHODOLOGI

Metodologi pembangunan Interior Design Capsule melibatkan beberapa prosedur utama untuk memastikan aplikasi ini memenuhi keperluan pengguna dan berfungsi dengan efektif seperti Rajah 1.



Rajah 1: Carta Alir pembangunan ID's Capsule

Pembangunan Interior Design Capsule melibatkan beberapa langkah utama untuk memastikan aplikasi ini memenuhi keperluan pengguna dan berfungsi dengan efektif. Langkah pertama ialah melakukan kajian literatur untuk memahami prinsip-prinsip rekabentuk dalaman, teknologi pendidikan, serta aplikasi digital sedia ada. Seterusnya, penilaian keperluan dilakukan melalui tinjauan dan temubual dengan pelajar dan pensyarah bagi mengenal pasti ciri-ciri yang diperlukan dalam aplikasi.

Langkah kedua ialah perancangan kandungan, di mana maklumat penting seperti prinsip reka bentuk, perancangan ruang, teori warna, pencahayaan, tekstur dan bahan, serta elemen seni bina dikumpul dan disusun. Dalam masa yang sama, rekabentuk antara muka yang mesra pengguna juga dirancang, dengan tumpuan kepada navigasi intuitif dan visual yang menarik untuk meningkatkan pengalaman pengguna.

Pembangunan seterusnya melibatkan pengkodan aplikasi menggunakan teknologi yang sesuai agar aplikasi berfungsi dengan baik pada pelbagai peranti mudah alih. Ciri-ciri seperti modul pembelajaran, kuiz, dan panduan visual turut dibangunkan dan semua komponen aplikasi diintegrasikan untuk memastikan keserasian dengan pelbagai sistem operasi.

Fasa ujian beta kemudian dijalankan dengan pelajar dan pensyarah untuk mengenal pasti sebarang isu teknikal atau penambahbaikan. Maklum balas yang diterima daripada ujian ini dianalisis, dan penyesuaian dibuat berdasarkan cadangan yang diterima.

Langkah akhir melibatkan pelancaran aplikasi secara rasmi kepada pengguna sasaran serta penyediaan sokongan teknikal yang mencukupi. Aplikasi ini akan dipantau secara berterusan, dengan penambahbaikan berkala berdasarkan maklum balas pengguna dan perkembangan teknologi terkini. Dengan mengikuti metodologi ini, Interior Design Capsule diharapkan dapat mencapai matlamatnya sebagai platform digital yang efektif dalam pendidikan rekabentuk dalaman.

III IMPAK

Interior Design Capsule memberikan impak yang signifikan dalam pendidikan rekabentuk dalaman dengan cara berikut:

- (a). Peningkatan Pemahaman Pelajar Interior Design Capsule menyediakan rujukan lengkap dan mudah diakses mengenai prinsip-prinsip rekabentuk dalaman, termasuk perancangan ruang, teori warna, pencahayaan, tekstur, dan bahan. Ini membantu pelajar memahami dan menerapkan konsep-konsep penting dengan lebih baik, sekaligus meningkatkan kemahiran mereka dalam reka bentuk dalaman.
- (b). Sokongan kepada Pensyarah: Aplikasi ini berfungsi sebagai alat bantu pengajaran yang berkesan, memudahkan pensyarah dalam menyampaikan maklumat secara terstruktur dan interaktif. Dengan menyediakan bahan pengajaran yang lengkap, pensyarah dapat menyokong proses pembelajaran dengan lebih baik.
- (c). Pengayaan Pengalaman Pembelajaran: Penggunaan teknologi digital dalam aplikasi ini meningkatkan keterlibatan pelajar melalui modul interaktif, kuiz, dan panduan visual. Ini memperkayakan pengalaman pembelajaran, menjadikannya lebih menarik dan berkesan.
- (d). Pengurangan Jurang Pengetahuan: Interior Design Capsule mengurangkan jurang pengetahuan antara teori dan amalan dengan menyatukan semua konsep penting dalam satu platform. Ini membolehkan pelajar memperoleh pengetahuan yang komprehensif dan konsisten dalam bidang rekabentuk dalaman.
- (e). Penambahbaikan Proses Pengajaran dan Pembelajaran: Aplikasi ini mempermudah proses pengajaran dan pembelajaran dengan menyediakan sumber yang

mudah diakses dan sentiasa diperbaharui. Ini menyokong perkembangan berterusan dalam pendidikan rekabentuk dalaman dan meningkatkan kecekapan dalam penyampaian maklumat.

- (f). Adaptasi kepada Era Digital: Interior Design Capsule mengadaptasi teknologi dalam pendidikan, selaras dengan perkembangan era 4.0. Ini menunjukkan usaha dalam mengintegrasikan alat digital dalam kurikulum pendidikan, sesuai dengan trend dan keperluan moden dalam pembelajaran.

IV. KESIMPULAN

Interior Design Capsule merupakan alat digital yang penting dalam mempermudah proses pembelajaran dan pengajaran rekabentuk dalaman dengan menyatukan semua konsep utama dalam satu platform yang mudah diakses. Aplikasi ini bukan sahaja meningkatkan pengalaman pembelajaran interaktif dengan menyediakan rujukan lengkap dan mendalam mengenai perancangan ruang, teori warna, pencahayaan, serta bahan dan tekstur, tetapi juga menyokong pensyarah dalam menyampaikan maklumat secara lebih berkesan. Dalam era digital 4.0, penggunaan teknologi ini menambah nilai kepada pendidikan dengan menyediakan akses mudah kepada maklumat terkini. Secara keseluruhannya, aplikasi ini diharapkan dapat membantu pelajar mencapai kejayaan akademik dalam bidang rekabentuk dalaman.

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