CREATIONS de UiTM

INTERNATIONAL MEGA INNOVATION CARNIVAL 2023

Fostering Innovation to Global Communities

LET'S CRAFT A BETTER WORLD TOMORROW!

ePROCEEDING

20th MAY 2023

UNIVERSITI TEKNOLOGI MARA
CAWANGAN SELANGOR, KAMPUS DENGKIL
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E-PROCEEDING BOOK

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FOREWORD



Assalammualaikum wbt and good day.

Alhamdulillah, all praises are to Allah, the merciful, and Beneficent by whose Grace and blessings, we have gathered here today.

It is my great pleasure to welcome you to Creations de UiTM: International Mega Innovation Carnival 2023 with the themes: "FOSTERING INNOVATION TO GLOBAL COMMUNITIES". I am very proud to announce that the Centre Centre of Foundation Studies is organizing its 3rd Mega Innovation Carnival, CREATIONS de UITM or CDU2023.

I would like to take this opportunity to express my utmost gratitude to various organizations which include UiTM Maker Lab, SW Corp, BITCOM and MRANTI for supporting this event.

Thank you and congratulations to the Organizing Committee of Creations de UiTM 2023 for working tirelessly to organize this event. Their tremendous support, cooperation, and hard work have enabled us to successfully organize this event, and we are grateful for that.

CDU2023 aims to spur innovation by providing a platform for local and international academic research groups to commercialize their innovations and ideas. Don't miss the opportunity to witness great innovations and gain knowledge through activities that are divided into online and face to face, including innovation competition, idea pitching, innovation & technology exhibition and webinars.

I believe Creations de UiTM is a great platform to nurture a creative and innovative culture among lecturers, teachers, researchers, and students of higher education institutions, locally and internationally.
The time for creativity and originality is NOW. Nurture any idea you have and join us in CDU2023.

Thank you.

Professor Ir. Dr. Ahmad Farid Abidin @ Bharun
Director
Centre of Foundation Studies
University Teknologi MARA (UiTM)
Cawangan Selangor, Kampus Dengkil

PROGRAM OVERVIEW

CREATIONS de UiTM: INTERNATIONAL MEGA INNOVATION CARNIVAL 2023 (CDU2023) is inspired by UiTM2025 Strategic Plan, which outlines the university's transformation to become a leading global university of science, technology, humanities, and entrepreneurship by 2025. Innovation development is crucial to gain knowledge, information, know-how, and technology, which could offer opportunities to the institution as well as the country to achieve the national development agenda. The implementation and diffusion of new ideas and talents, as well as their continual evolution, are critical in making innovation a major catalyst that can propel Malaysia five years ahead toward the status of a developed and high-income country.

In 2023, the Centre of Foundation Studies at UiTM Cawangan Selangor Kampus Dengkil once again assumes the responsibility of hosting an international innovation exhibition and competition following the success of a mega exhibition and innovation competition in previous years. With the theme "Fostering Innovation to Global Communities", CDU2023 provides a golden opportunity for innovators from all walks of life to showcase their creativity and the spirit of innovation. This program will adapt to the new norms and be conducted in hybrid mode. The innovation competition is open virtually to both international and Malaysian innovators ranging from school students to professionals. The physical exhibition is open to UiTM industrial partners, selected primary and secondary schools, and our students, to share their work with the local community. The aim of this program is to provide exposure and experience with various academic content on innovation that is not only interesting but also useful to the community. It keeps countries and innovators remain relevant, competitive, and adaptive, which also strengthening the culture of innovation among innovators, as a well-nurtured and optimized culture of innovation plays a pivotal role in successful innovation.

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CATEGORY A
Professional

Polarization of Light Experimental Kit: New Design

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ABSTRACT

Polarization is an important property of light that has numerous applications in science and technology. It refers to the orientation of the electric field vector of a light wave as it propagates through space. Polarization is one of the topics that have been taught in the Foundation Physics course. Time constraints and a lack of appropriate laboratory apparatus are the two main reasons why this topic is only being taught theoretically, making it difficult for students to grasp the concept. Due to these constraints, a group of physics lecturers at the Centre of Foundation Studies UiTM Dengkil introduced and developed a simple experimental kit called the "Polarization of Light Experimental Kit" as an initiative to help students' understanding by visualising the polarization process. This kit is portable, mobile, and easy to handle. Thus, it will attract students' interest and serve as an interesting hands-on activity for them. A preliminary questionnaire survey was distributed to Foundation Science and Engineering students at UiTM Dengkil back in 2017 to assess their understanding on the polarization concept before and after using previous design of this experimental kit in their learning process. From the analysis, about 58% from 120 students agreed that this experimental kit was able to enhance their understanding on polarization of light concept and their interest in learning Physics. The design of this kit is being improvised to make it more practical and attractive to be marketable. Recently, a new survey has been distributed by introducing our new design of the Polarization of Light Experimental kit to a sample of 126 foundation students at Centre of Foundation Studies to assess their understanding on the polarization concept before classroom session, during classroom session and after using the new design experimental kit in classroom learning process. From the analysis, the percentage of the students that agreed the new design experimental kit gave them a better impact on enhancing their understanding and interest on polarization of light concept has increased to 70%. This experimental kit has a high potential to be commercialized as a useful teaching aid for educators and students who want to gain a deeper understanding of the polarization of light concept and its applications.

Keywords: Polarization of Light; Polarized Light; Experimental Kit

INTRODUCTION

Polarization of light is a fascinating phenomenon that is widely observed in our daily lives. It occurs when light waves vibrate in a single plane instead of in all directions, which results in the creation of a polarized light wave. The study of polarization of light has many practical applications in fields such as optics, telecommunications, and astronomy. Since teaching a physics theory without a proper introduction of mathematical tools such as metrices, vectors and complex numbers is a problem [1], and if physics is taught solely through the lecture method, students will only understand formulas or abstract concepts [2].

Although there are studies on students' difficulties with wave optics concepts and phenomena [3–6], it primarily focuses on light interference and diffraction. Fewer studies discuss the understanding of students on the light polarization published. The same problem occurs for foundation students at Centre of Foundation Studies in UiTM, when the polarization topic only being taught theoretically due to limited time and unavailable of proper experimental tools. Thus, students rarely understood the concept without experiencing the phenomena themselves.

As knowing the benefit of teaching aids usage in learning provide opportunities for students to be active in learning, allowing them to gain knowledge and develop psychomotor skills, as well as foster student creativity to solve problems encountered [7─8], a physics lecturers' innovation team at Centre of Foundation Studies, UiTM has developed an interactive, portable and cost effective polarization of light experimental kit for quantitatively verifying the nature of polarized light.

INNOVATION DEVELOPMENT

First and foremost, this polarization of light experimental kit has gone through three phases of improvisation from 2016 to 2022. This kit was invented from scratch in 2016 by using a kitchen paper roll as the main body and the adjustable rotation part with drawing angle scales. The polarizer used was the polarized sunglasses. In 2018, the fragile body and adjustable rotation part of the kit were being replaced by the PVC pipe with addition of a lux meter as the measured intensity of light tool. A survey has been done to collect students feedback based on their experience using this kit as a learning aid in classroom. Based on the feedback, this kit evolved to become the latest 3D printed design with 15-degree angle scale with stands, set of polarizer sheets and a lux meter. This latest design received a great impact on students' feedback. This kit has received medals for several innovation competitions and has been protected with Intellectual Property Recognition (IPR).

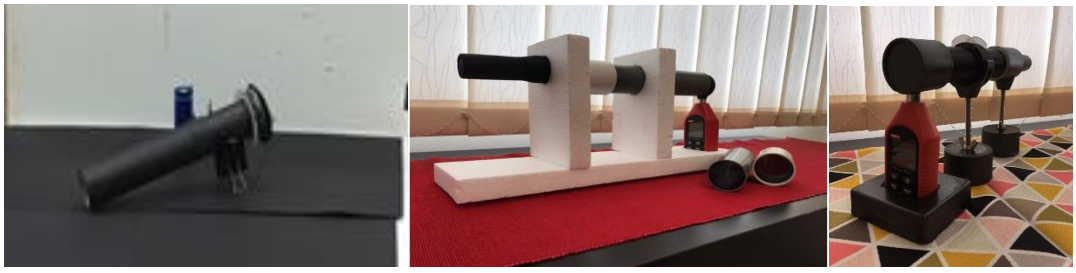


Figure 1: The revolution of the "Polarization of Light Experimental Kit" from 2016 to 2022

COMMERCIAL POTENTIAL

Polarization is one of interesting topic to be discussed in class. Due to its fascinating phenomenon that is widely observed in daily lives, students gained valuable knowledge and information from learning this topic. Because of time constraint while discussing the topic and lack of laboratory apparatus, students and lecturers must limit the extension knowledge regarding polarization. Thus, the students just comply the theoretical part. To make it interesting and help students grasp the theory, a polarization of light experimental kit was invented and thus developing a hands-on activity can give the students the real experience while learning the polarization topic in class. This Polarization of Light Experimental Kit was purposely designed to become portable and can be carried around easily. A telescope-like shape gives the outlook

more practical to be handled. Furthermore, much easier to look through the light intensity in various angle. Hence, the knowledge also covered most crucial theory in polarization topic which is Malus' Law. The material of telescope-like shape is made of thermoplastic aliphatic polyester (PLA). This material is fully biodegradable thermoplastic polymer. Therefore, it safe for environment. The designing process of the experimental kit is easy and affordable. The whole component of the main body was printed by 3D-printer. The polarizer is a customize polaroid sheet so that it can be used for several polarizers. The polarization of light topic is included in physics' syllabus. However, the topic just small part in the lesson plan and there is no experiment conducted for the topic. Due to this circumstances, polarization of light experimental kit is a new solution to deliver this topic interestingly in class. Other than help students understanding, this kit succeeded to gain students interest in learning polarization of light. This kit is practical, attractive, and affordable. It has a high potential to be commercialized. This kit is ready to be in the market and already protected with IPR.

Figure 2 shows the set-up of the polarization of light kit that consists of 2 polarizer sheets, 3 stands, 3─D printed adjusting rod with 15-degree angle scale, a lux meter as the light intensity detector and torchlight as a light source.



Figure 2: The "Polarization of Light Experimental Kit: New Design"

Table 1 shows the result of the intensity of light detected by the lux meter. Table 2 shows the result of the intensity of light observed by bare eyes.

Table 1: The intensity of light detected by Lux Meter

Angle of the 1st polarizer	Angle of the 2nd polarizer	Intensity of light (lux)
0^o	0^o	Maximum Intensity: ± 38
0^o	90^o	Minimum Intensity: 0
0^o	$0^o < \theta < 90^o$	0 < intensity < 38

Table 2: The intensity of light observed by Bare Eyes

Angle of the 1st polarizer	Angle of the 2nd polarizer	Intensity of light
0^o	0^o	Maximum Intensity: Bright
0^o	90^o	Minimum Intensity: Dark
0^o	$0^o < \theta < 90^o$	Reducing intensity: less bright

CONCLUSION

In a nutshell, the polarization of light experimental kit is successful in achieving all the objectives of the product appearance. In the future, the product will be completed with smart polarizer slit and various angle's marker. Furthermore, this product is recommended to be used in foundation studies as a complementary teaching aid as hands-on activity in the class. As for future planning, the kit is going to be provided by the method to apply for Malus' Law.

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REFERENCES

[1] Y. Lehavi *et al.*, "Classroom evidence of teachers' PCK of the interplay of physics and mathematics," *Springer Proc. Phys.*, vol. 190, pp. 95–104, 2017, doi: 10.1007/978-3-319-44887-9_8.

[2] S. Wahyuni, K. Kosim, and G. Gunawan, "Pengembangan Perangkat Pembelajaran Fisika Berbasis Inkuiri Terbimbing Berbantuan Eksperimen Untuk Meningkatkan Penguasaan Konsep Siswa," *J. Pendidik. Fis. dan Teknol.*, vol. 4, no. 2, pp. 240–246, 2018, doi: 10.29303/jpft.v4i2.891.

[3] V. Mešić, E. Hajder, K. Neumann, and N. Erceg, "Comparing different approaches to visualizing light waves: An experimental study on teaching wave optics," *Phys. Rev. Phys. Educ. Res.*, vol. 12, no. 1, pp. 1–18, 2016, doi: 10.1103/PhysRevPhysEducRes.12.010135.

[4] P. Colin and L. Viennot, "Using two models in optics: Students' difficulties and suggestions for teaching," *Am. J. Phys.*, vol. 69, no. S1, pp. S36–S44, 2001, doi: 10.1119/1.1371256.

[5] B. S. Ambrose, P. R. L. Heron, S. Vokos, and L. C. McDermott, "Student understanding of light as an electromagnetic wave: Relating the formalism to physical phenomena," *Am. J. Phys.*, vol. 67, no. 10, pp. 891–898, 1999, doi: 10.1119/1.19144.

[6] B. S. Ambrose, P. S. Shaffer, R. N. Steinberg, and L. C. McDermott, "An investigation of student understanding of single-slit diffraction and double-slit interference," *Am. J. Phys.*, vol. 67, no. 2, pp. 146–155, 1999, doi: 10.1119/1.19210.

[7] Abdul Samad Hanif, H. P. Mohamed NorAzhari Azman, and Nurul Nazirah Mohd Imam Ma'arof, "Kit Pemantauan Penyambungan Litar Elektrik: Satu Kajian Efikasi Alat Bantu Mengajar," *Geogr. Malaysian J. Soc. Sp.*, vol. 12, no. 3, pp. 69–78, 2016.

[8] N. S. Kadir and M. I. H. Yaacob, "The Development and Usability of Optics Kit as a Teaching Aid among Physics Trainee Teachers," *J. Phys. Conf. Ser.*, vol. 2309, no. 1, 2022, doi: 10.1088/1742-6596/2309/1/012040.

CoGLIEx: Exhibiting Knowledge, Skills and Talent

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ABSTRACT

In modern education, educators play a vital role in facilitating the learning process and supporting learners' growth through innovative teaching strategies that allow them to explore knowledge and improve skills independently. However, the overemphasis on traditional pen-and-paper assessments is not sufficient for developing soft skills. The Contemporary Global and Legal Issues Exhibition (CoGLIEx) is an innovative assessment tool that allows participants to showcase their talents, learn essential skills, and share knowledge on contemporary global and legal issues. It aims at developing innovative assessments by using exhibitions as a learning activity that identifies talent and improves learners' knowledge and skills. Integrating CoGLIEx into learning activities promotes the development of leadership, interpersonal, problem-solving, and communication skills, as well as fostering self-esteem, confidence, collaboration, and creativity among participants. Visitors of CoGLIEx also benefit from this exhibition as it exposes them to contemporary global issues and creates awareness of society's role in curbing these issues. Additionally, CoGLIEx also offers the opportunity of exploring possible collaborations with other organizations or stakeholders to expand the reach and impact of the exhibition. This could involve partnering with academic institutions or non-profit organizations to bring in new perspectives and resources, allowing it to have a greater impact in promoting learning and awareness of contemporary global issues. This paper opens for further discussion on the use of exhibitions as assessment tools in higher education.

Keywords: Innovative Assessment Tool; Authentic Assessment; Exhibitions; Soft Skills; Project Based Learning

INTRODUCTION

Traditional forms of assessment, such as pen-and-paper assessment, have been the norm in education for many years. However, these types of assessments are limited in their ability to measure certain skills, such as soft skills, creativity, and problem-solving. Broughton, Brumpit, Pincas and Wilde (2002) claim that the traditional learning method heavily relies on teacher instruction and it does not offer adequate opportunities to the students for participation [1]. Additionally, traditional assessments often rely heavily on memorization and regurgitation of information, rather than encouraging critical thinking and application of knowledge [1]. As a result, students may not be fully prepared for real-world situations that require more than just memorization of facts. This highlights the need for innovative assessment methods that can better measure a wide range of skills and abilities, and prepare students for success in their future careers. CoGLIEx can be considered a new paradigm in teaching and learning as it

provides a unique opportunity for students to engage in experiential learning through a competition-based poster exhibition. This approach to assessment is different from traditional pen-and-paper assessments, as it provides an open-ended challenge that requires students to demonstrate mastery of skills and knowledge in a creative and engaging way [1]. Moreover, CoGLIEx is considered an authentic assessment because it requires students to apply their knowledge and skills in a real-world context. Through authentic assessment, learners are given the experience to practise real-life problem-solving skills, communication and critical thinking in addition to collaboration and networking [2].

The project aims to use exhibitions as a form of authentic assessment and learning activity to help identify talent and improve learners' knowledge and skills. Furthermore, the practical nature of exhibitions such as CoGLIEx provides a more accurate representation of the student's abilities, as opposed to traditional pen-and-paper assessments. Specifically, the objectives of CoGLIEx include: (i) Nurturing leadership, interpersonal, problem-solving, and communication skills among participants; (ii) Developing self-esteem, confidence, collaboration, and creativity among participants; (iii) Providing an opportunity for learners to identify and grow their talents; (iv) Exposing visitors to contemporary global issues and creating awareness of society's role in curbing these issues and (v) Offering an engaging and functional learning strategy that educators can use to create criterion-referenced assessments.

These objectives are designed to encourage active participation and promote the development of both hard and soft skills among participants.

INNOVATION DEVELOPMENT

The innovation development of CoGLIEx is the use of exhibitions as a learning activity that identifies talent and improves learners' knowledge and skills. Exhibitions have been used as a means of showcasing and sharing knowledge, but their potential as an assessment tool in higher education has not been fully explored. CoGLIEx is an innovative approach that leverages exhibitions as a tool for assessing learners' soft skills, such as leadership, interpersonal, problem-solving and communication skills [3]. It can also be considered an informal learning setting as it provides participants with the opportunity to showcase their talents, learn essential skills, and share knowledge in a more relaxed and interactive environment than traditional classroom assessments. For instance, a review of the literature revealed that informal learning settings have a positive effect on students' learning processes and the development of skills [4].

CoGLIEx stands out as a unique assessment tool for pre-law institutions, as it is the first of its kind and has not been implemented before. By providing participants with a platform to showcase their knowledge and skills on these topics, CoGLIEx fosters a deeper understanding of these issues and encourages participants to become active in finding solutions to them [5]. The development of CoGLIEx is supported by research that highlights the limitations of traditional pen-and-paper assessments in developing soft skills. The overemphasis on such assessments can hinder learners' growth and limit their potential. In contrast, CoGLIEx provides learners with an opportunity to engage in hands-on, experiential learning, which is a more effective way of developing soft skills [6] [7].

CoGLIEx is conducted during week ten (10) of Semester Two (2) for the Foundation in Law program, as students would have already gained knowledge on research methods during the first semester. The CoGLIEx exhibition provides an opportunity to enhance both research and soft skills for the participating students. To conduct CoGLIEx, students are required to form

a group consisting of 10 members and select a topic that relates to global and legal issues. Following this, they will need to engage in a discussion with their instructor and carry out preliminary research with the guidance and approval of their instructor. Afterwards, the students will create a visually appealing poster presentation and design their booth display in preparation for the exhibition day. To ensure that the final product meets the desired learning outcomes and assesses the necessary skills, the organizers provide an assessment rubric for the participants [8]. This rubric helps to evaluate the quality of the posters and the ability of the groups to present their research in a clear and engaging way. It covers various aspects such as content relevance, organisation, use of visuals, and presentation skills.



Figure 1: Platform to share knowledge and foster soft skills

The novelty of CoGLIEx is evident in the way it integrates with learning activities to promote the development of soft skills. It provides participants with an opportunity to learn essential skills, showcases their talents, and share their knowledge in a collaborative and supportive environment. Visitors of CoGLIEx also benefit from the exhibition, as it exposes them to contemporary global issues and creates awareness of society's role in curbing these issues. Overall, the innovation development of CoGLIEx represents a unique approach to assessing learners' soft skills in higher education. It is an innovative and original product that has the potential to transform the way we assess learners and promote learning and awareness of contemporary global issues.

COMMERCIAL POTENTIAL

Relevance of the Invention

The invention of the CoGLIEx addresses the problem of over-reliance on traditional pen-and-paper assessments in higher education, which are not suitable for developing soft skills. CoGLIEx provides a new and innovative way of assessing learners' knowledge and skills by using exhibitions as a learning activity. CoGLIEx contributes to new knowledge by providing a platform for learners to engage with contemporary global issues, as well as fostering the development of soft skills. Moreover, CoGLIEx contributes to the technology and environment by using digital tools and multimedia to enhance the learning experience and showcase the exhibitions. The integration of digital technologies and multimedia such as video presentations, and visual aids makes the exhibitions interactive and engaging, thereby improving the learners' knowledge and skills. Additionally, CoGLIEx contributes to society by promoting learning and

awareness of contemporary global issues, which is essential in developing informed and responsible citizens who can contribute positively to society.

The market needs and market potential

As an innovative assessment tool that promotes the development of soft skills and knowledge on contemporary global and legal issues, CoGLIEx has the potential to be commercialized in various ways. One potential market is pre-law institutions, higher education institutions or schools that value the importance of soft skills development and innovative assessment methods can adopt CoGLIEx as part of their curriculum or continuous assessment. Traditional pen-and-paper assessments are no longer sufficient to assess students' knowledge and skills, and educators are looking for new ways to engage students in learning and assessment. CoGLIEx can also be marketed to non-profit organizations that focus on global and legal issues, as an exhibition that can help raise awareness and educate the public. Furthermore, CoGLIEx can also be sponsored by companies that support education and social responsibility. These companies can provide funding for the event and collaborate with the students to create engaging and relevant exhibition topics.

Proof of the related published work/Award

CoGLIEx has been conducted three times at the Centre for Foundation Studies, Universiti Teknologi MARA, with a different theme, and has attracted almost 2000 participants in total. The competition has proven to be a success, as CoGLIEx won a gold medal at the Pre-University Matriculation Innovation Competition 2023 (PIITRAM) for an academic category. The winning proved that CoGLIEX is significant and effective and also could be a potential assessment tool. By conducting CoGLIEx multiple times with different themes, also shows the flexibility and adaptability of the tool to different subject areas and contexts.



Figure 2: CoGLIEx's Poster

CONCLUSION

In conclusion, the Contemporary Global and Legal Issues Exhibition (CoGLIEx) is an innovative and authentic assessment tool that has been successfully implemented in the Centre for Foundation Studies, Universiti Teknologi MARA at a pre-law level. It provides an

opportunity for students to apply their research and soft skills in a competitive and engaging setting, while also addressing the market needs of developing well-rounded and globally aware individuals. Moreover, the use of exhibitions as an assessment tool has been supported by research and literature, indicating that it is a valid and effective method of assessment. As a new paradigm in teaching and learning, CoGLIEx has the potential to be adopted in other educational institutions and disciplines, contributing to the development of competent and well-rounded individuals.

Some potential future developments for CoGLIEx could include expanding the competition to include participants from other universities or even internationally, incorporating technology and multimedia elements into the poster exhibitions, and exploring partnerships with industry or organizations for sponsorship and mentorship opportunities for participants. Additionally, the organizers could continue to evaluate and refine the assessment rubric to ensure that it accurately measures the desired learning outcomes and skills. Overall, CoGLIEx has the potential to revolutionize the way we assess learning outcomes in higher education and contribute to the development of a more socially conscious and globally aware society.

REFERENCES

[1] Davidson, J. (2009). Exhibitions: Connecting classroom assessment with culminating demonstrations of mastery. Theory in Practice, 48(1): 36-43. DOI: 10.1080/00405840802577585

[2] Abdul Aziz, M.N, Mohd Yusoff, N. & MohdYaakob, M.F. (2020). Challenges in using authentic assessment in 21st century ESL classrooms. International Journal of Evaluation and Research in Education, 9(3), 759-768. DOI: 10.11591/ijere.v9i3.20546

[3] Eralievich, S. X., Orinbayevna, A.S., & Shavkatovich, R. (2020). The importance of exhibitions and competitions in organising fine art clubs in schools. Journal of Critical Reviews, 7(15), 2519-252. DOI: http://dx.doi.org/10.31838/jcr.07.14.206

[4] Broughton, G., Brumfit, C., Pincas, A., & Wilde, R. D. (2002). Teaching English as a foreign language. Routledge.

[5] Taylor, M. & Dieker, L. (2018). Exhibiting What is Learned: Using Exhibition Assessments and Universal Design for Learning in College Teaching. Innovative Practice in Higher Education, 3(2). 32-47.

[6] Quinn, D. & Shurville, S. (2009). From little things big things grow: Scaling-up assessment of experiential learning, *Campus-Wide Information Systems*, 26(5), 329-344. DOI: https://doi-org.ezaccess.library.uitm.edu.my/10.1108/10650740911004769

[7] Kolb, A.Y. & Kolb, D.A. (2005). Learning styles and learning spaces: enhancing experiential learning in higher education. Academy of Management Learning and Education, 4(2), 193-212.

[8] Black, D.R., Weinberg, L.A. & Brodwin, M.G. (2015). Universal design for learning and instruction: Perspectives of students with disabilities in higher education. Exceptionality Education International, 25(2), 1–26.

A Garden Storage Trolley with Dried Leaves and Trash Collector

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ABSTRACT

A fabrication of a garden storage trolley with dried leaves and trash collector has designed in this project. The objective and main purpose is to reduce the burden of housewife or gardener bring the gardening tools while sweeping dried leaves when doing gardening or cleaning activities at their area. The add on dried leaves and trash collector make them easy and less energy used to collect the dried leaves and trash at a medium grass area. The partition and storage of gardening tools were fabricated using mild steel material. Some fabrication processes of the product like cutting, grinding, welding, finishing have done completely. Conclusion, it will help people especially gardener or housewife doing gardening or cleaning work with less energy used and user friendly.

Keywords: Garden; trolley; trash; collector

INTRODUCTION

Gardening is a good activity for body health. Gardening is one of a mental therapy and can be enjoyed by people of all ages. Gardening requires many different activities such as sweeping dried leaf, digging, watering plant, pruning and others. There are a lot of gardening tools such as, dried leaf collector, rake, shovel, cutter, wheelbarrow and others. Therefore, the right gardening tools will make the garden work easier.

There are many gardens trolley that are currently available in the market either made of metal or plastic [1,2]. This project proposed a garden storage trolley with a dried leaves & trash collector. The garden storage trolley with a dried leaves & trash collector will use mild steel material for the main frame, electrical components, and polyurethane cast wheels [3-5]. The main purpose of this product is to help the gardener to collect the dried leaf at moderate field area easier instead of using sweep manually while bring the other garden tools belong during their work [6]. The other gardening tools can be used when it needed.

Several fabrication methods were used to fabricate the product such as, cutting process, grinding process, assembly process, and welding processes [3,4].

The current available gardening trolley and dried leaves & trash collector in the market have a single function and specific task. Therefore, to have both function as garden storage trolley and dried leaves & trash collector will give advantage and user friendly to the user of this product.

Nowadays the age of the gardener or housewife range around 40-60 years old. With the old age factor, it will give them a hard time with their ability to do all the gardening 14 or

cleaning chores. Besides that, if gardening and cleaning are done manually especially in a moderate field area, it will spend a lot of energy and time. Therefore, this also will waste time for the workers. This is because user need to commute to grab their cleaning/gardening tools and put them back at the storage. This also will give hard time for workers who have joint problems because of old age factor. Therefore, the garden storage with a dried leaves collector has proposed to solve of the problem [7,8].

INNOVATION DEVELOPMENT

The development of innovation depends on the type of economic activity that is developed by the owner. Economic development and growth depend as much on social innovations as on technological advances. This type of trolley has adds on with the collector approached by gardener trolley which bring a lot of tools for gardening cleaning. Therefore, this new design has been proposed for make it easier while doing the gardening at the same time can collect the rubbish as well as dried leaves at medium area. A motor has been attached to the collector. It is manual power on off when it is needed. The prototypes of the product as presented below in Figure 1 and 2. The drawing and parts of the product features have shown in the Figure 3 and 4, respectively.



Figure 1: Isometric view

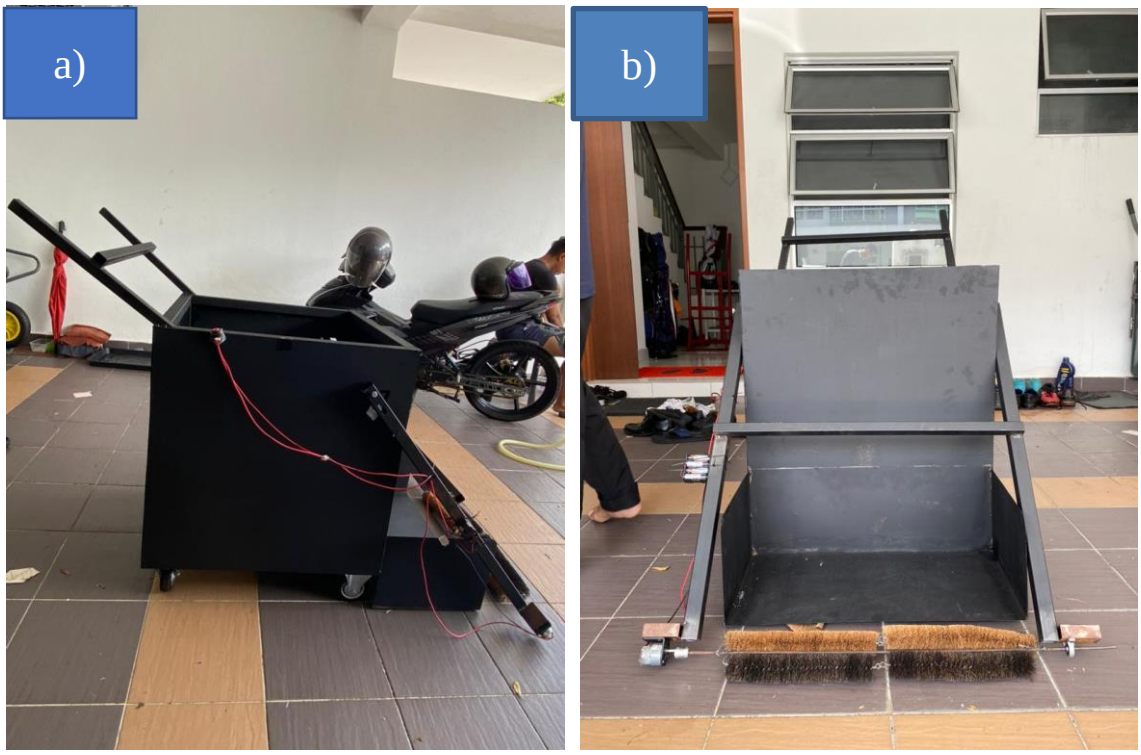


Figure 2: a) side view and b) front view

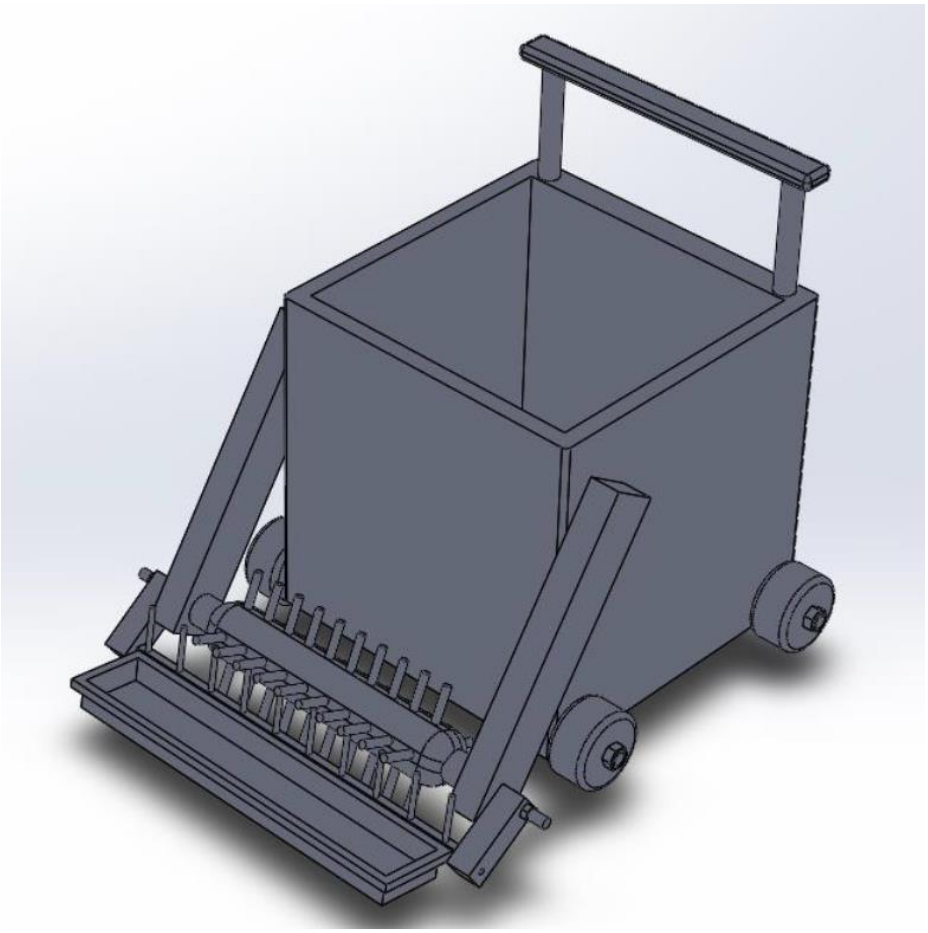
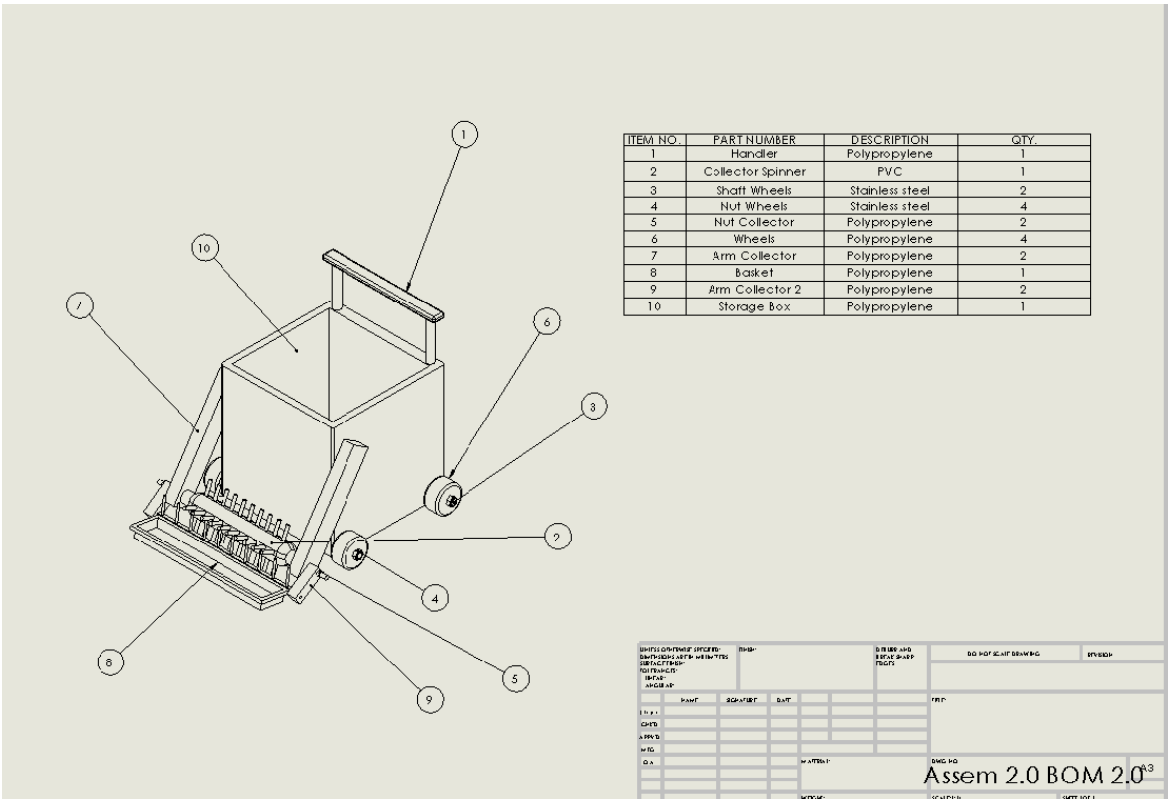


Figure 3: Drawing of the product using Solid work software



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Handler	Polypropylene	1
2	Collector Spinner	PVC	1
3	Shaft Wheels	Stainless steel	2
4	Nut Wheels	Stainless steel	4
5	Nut Collector	Polypropylene	2
6	Wheels	Polypropylene	4
7	Arm Collector	Polypropylene	2
8	Basket	Polypropylene	1
9	Arm Collector 2	Polypropylene	2
10	Storage Box	Polypropylene	1

Figure 4: The features of the product

COMMERCIAL POTENTIAL

This gardening storage trolley with dried leaves & trash collector is a user-friendly product that can be used during gardening activities. It has a potential for commercialize as low-cost product. Moreover, the simplicity of the design can provide greater convenience or human life. This product will provide an important opportunity to advance the understanding of fabrication process and analysis of maximum load any other mechanical engineering mechanism related to product.

CONCLUSION

The fabrication of the Garden Storage Trolley with Dried Leaves and Trash Collector met the objectives. It helps people reduce their burden doing gardening and cleaning and save time while doing the work. The idea is to use less force while doing gardening or cleaning activities, thereby conserving the worker's energy. For the recommendation, the fabrication of collector of brush should be enhanced to be bigger size than the designing one for an effective dried leaves collector.

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REFERENCES

[1] Shubham S. Shiwarkar, Sagar D. Pairag, Prof. Shailendra R. Zaveri. (2018). Design and Fabrication of Easy Handling Trolley. International Research Journal of Engineering and

Technology (IRJET), 5(5), 1690-1694

[2] Ozherelev V.N1, Ozhereleva M.V2, Somin V.V1. (2019). Improving the design of the trolley for the manual harvesting of strawberry. Tractors And Agricultural Machinery, 86(4), 22-27. https://doi.org/10.31992/0321-4443-2019-4-22-27

[3] Md. Masood; Kalpana Seelam. (2022). 2022 2nd International Conference on Technological Advancements in Computational Sciences. Design and Development of Automated Marine Trash Collector for Trash collecting Applications. https://doi.org/10.1109/ICTACS56270.2022.9988497

[4] Stefan Morana, Julia Kroenung, Alexander Maedche, Silvia Schacht. (2019). Journal of Association for Information System. Designing Process Guidance Systems, https://doi.org/10.17705/1jais.00542

[5] Dag Lukkassen and Annette Meidell. (2007). Book manuscript, Narvik University College. Advanced Materials and Structures and their Fabrication Processes

[6] Esther Cloutier. (1994). The effect of age on safety and work practices among domestic trash collectors in Québec. Safety Science. 17(4), 291-308. https://doi.org/10.1016/0925-7535(94)90030-2

[7] Jeff Smithers. (2014). Review of sugarcane trash recovery systems for energy cogeneration in South Africa. Renewable and Sustainable Energy Reviews, 32, 915-925. https://doi.org/10.1016/j.rser.2014.01.042

[8] Lois Tyson. (2023). Routledge, 4th edition. Critical Theory Today: A User-Friendly Guide. https//: doi.org/10.4324/9781003148616

THE MOOVY I: INTERACTIVE GAME FOR VOCABULARY LEARNING

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ABSTRACT

Vocabulary is the backbone of any language because, without sufficient vocabulary, nothing can be conveyed. There is no greater frustration in language learning than not being able to convey messages to others. Consequently, it would take away the joy of learning. In learning a language, traditional vocabulary learning strategies have included matching exercises – synonyms and antonyms, fill-in-the-blanks worksheets, and flash cards. While some of these strategies remained beneficial, teachers and students in today's technology-driven world are strongly urged to adapt to Generation Z's learning style which is learning by doing and through gadgets. For this reason, numerous mobile applications have been developed, especially for English language learners. Nevertheless, some applications are not tailored to the needs of Malaysian pre-university students preparing for the Malaysian University English Test (MUET). This standardized language proficiency is used to assess the proficiency level of pre-university students who wish to pursue their first degree and they should obtain a minimum band score to qualify for admission into their desired course of study. Hence, this study aims to assist MUET students in enhancing their vocabulary through gamified lessons using a tool called MOOVY I. The MOOVY I prototype has incorporated a few game mechanics such as points and challenges that would motivate students to learn and complete tasks. The tool has significant commercial potential in the educational technology market, especially in Malaysia where it can be marketed to individuals, including MUET test-takers, who are looking to improve their English language skills. In conclusion, MOOVY I has substantial commercial potential in the education technology market, and with the development strategies, it can become a leading vocabulary learning tool in Malaysia and beyond.

Keywords: Vocabulary; Malaysian University English Test (MUET); gamified lessons; game mechanics

INTRODUCTION

MUET stands for Malaysia University English Test. It is an English proficiency test used to assess the English language proficiency of Malaysian students who wish to pursue tertiary education in Malaysia or abroad. It is also a yardstick used by universities and colleges in Malaysia as a requirement for admission and by employers as a measure of English Language proficiency. The test consists of four language components: Listening, Speaking, Reading, and Writing.

Recent studies conducted locally revealed that many pre-university students are still struggling with writing. According to a case study conducted in a suburban school in Mukah District, Sarawak, 40% of the students who took the MUET Writing Paper did not perform

satisfactorily, receiving scores in Band 1 and Band 2 categories [1]. This was attributed to their inadequate proficiency in the English language. Many studies revealed that one of the biggest stumbling blocks in writing is poor vocabulary [2,3]. Nation (2013) argued that "vocabulary knowledge is fundamental to almost all aspects of language use, and it is essential for listening, speaking, reading, and writing" (p. 6) [4]. This is similar to other recent studies which suggested that poor vocabulary knowledge is a significant barrier to developing language skills, but targeted vocabulary instruction can be an effective approach to improving students' proficiency [5,6,7].

In essence, vocabulary knowledge is a crucial component of language proficiency and is a key factor in achieving high scores in MUET. Acquiring new vocabulary can be time-consuming and monotonous for many students, and traditional teaching methods may not always be effective especially for Generation Z. To address this challenge, this study presents the prototype of the MOOVY I which is designed to assist students in acquiring MUET-specific vocabulary through gamified lessons. The platform uses techniques such as gamification, and spaced repetition to ensure that students acquire vocabulary knowledge in a way that is both fun and effective.

In conclusion, The MOOVY I can be a promising tool for students who are preparing for MUET. Its gamified lessons and spaced repetition features make it an engaging and effective way for students to acquire MUET-specific vocabulary. By addressing the challenges that students face in learning vocabulary, MOOVY I has the potential to improve students' language proficiency and their MUET scores.

INNOVATION DEVELOPMENT

The MOOVY I is an innovative gamified learning tool that offers a personalized approach to vocabulary learning. The web-based application is designed to be engaging and fun for students and its unique features set it apart from traditional learning methods.

One of the most inventive features of MOOVY I is its gamification approach. The application incorporated multimedia learning resources such as audio, visuals, interactive games, and quizzes to reinforce learning and offer instant feedback to help students identify areas where they need to improve. This approach has been proven to be effective in engaging students and encouraging them to persist in their learning [8].

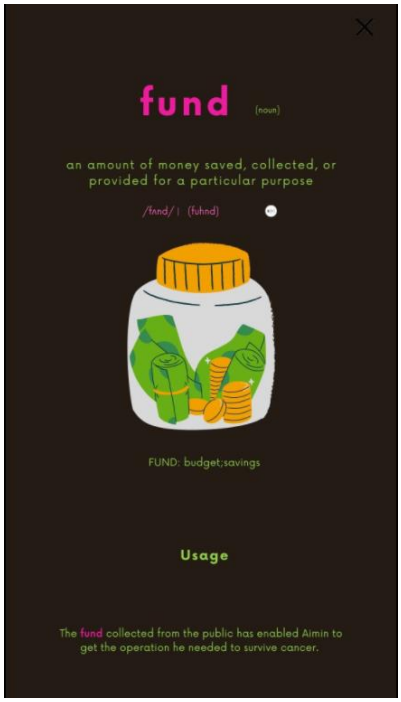


Figure 1: Innovation Prototype (Interactive Flash Card)

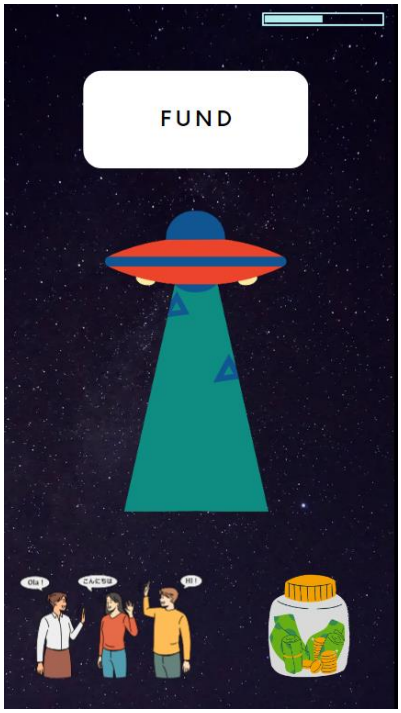


Figure 2: Innovation Prototype (Quiz)

Another important feature of MOOVY I is its use of spaced repetition. This technique involves revisiting previously learned vocabulary at specific intervals to ensure that the knowledge is retained in long-term memory [9]. This is important as vocabulary knowledge needs to be retained over an extended period, especially for students who are preparing for MUET. MOOVY I incorporates spaced repetition into its lessons, ensuring that students are constantly reviewing and reinforcing their vocabulary knowledge.

Most importantly, the game is highly accessible in which it is designed to be user-friendly. It can be accessed through a web-based platform, making it accessible at any time, from any device with an internet connection. This makes it a flexible and convenient solution for students who may not have access to traditional classroom resources. Additionally, it is also designed to be intuitive and user-friendly, making it easy for students to navigate and use on their own.



Figure 3: Innovation Prototype (Menu page)

Overall, the focus on MUET-specific vocabulary is a key feature of the application's novelty and originality, as it sets it apart from other vocabulary learning tools and makes it more relevant and useful for MUET students.

COMMERCIAL POTENTIAL

The development of the web-based application, MOOVY I is highly relevant in addressing the problem of vocabulary learning among students. The MUET exam is a high-stakes exam that requires a strong grasp of specific vocabulary in order to perform well. However, many students struggle with vocabulary learning, which can hinder their academic and professional success. The application addresses this problem by providing a gamified, interactive learning experience that is specifically designed to support MUET students in learning the vocabulary required for the exam.

The market potential for application is significant, given the large number of MUET students who require support in vocabulary learning. In addition, the application has the potential to be adapted for use in other language learning contexts, further expanding its market potential.

MOOVY I provides a solution to the user's needs by offering a gamified, interactive learning experience that is specifically tailored to the vocabulary requirements of the MUET exam. The program is highly customizable, allowing students to focus on the areas where they need the most support. The application's innovative approach and focus on MUET-specific

vocabulary make it highly marketable, as it fills a gap in the market for effective, targeted vocabulary learning tools.

The proposed selling price for the application will depend on a number of factors, including development costs, marketing expenses, and competition in the market. However, given the program's unique features and potential market demand, it is reasonable to expect a competitive selling price with a healthy profit margin.

CONCLUSION

In conclusion, the MOOVY I is a highly innovative and effective tool for supporting vocabulary learning among MUET students. Befitting to its purpose, the tool will be tailored to the vocabulary requirements of the MUET exam. It has the potential to significantly improve students' vocabulary knowledge, which will ultimately contribute to their academic and professional success.

Future development of the game could involve expanding its market potential to other language learning contexts, as well as including a data-driven approach to learning. Improvisation planning could also involve incorporating new features, such as speech recognition technology, which would enable students to practice their speaking skills and pronunciation.

Overall, the MOOVY I application is an innovative and highly relevant solution to the problem of vocabulary learning among MUET students. Its unique approach, incorporating gamification and interactive elements, makes it highly engaging and motivating for learners. With further development and refinement, it has the potential to revolutionize the way in which students learn vocabulary and improve their academic and professional prospects.

REFERENCES

[1] Jee, S., & Aziz, A. (2021). The Application of the Process-Based Writing Approach in Composing an Argumentative Essay: A Case Study of a Suburban Secondary School of Mukah District in Sarawak. Creative Education, 12, 880-896.
[2] Xin, J., Li, X., & Chen, L. (2020). Vocabulary knowledge and writing proficiency: A study of Chinese university students. Journal of English for Academic Purposes, 46, 100869. https://doi.org/10.1016/j.jeap.2020.100869
[3] Kuo, Y.-C., Chen, C.-Y., & Lee, H.-T. (2020). The effects of a vocabulary intervention program on EFL learners' vocabulary knowledge and writing skills. International Journal of English Linguistics, 10(3), 1-18. https://doi.org/10.5539/ijel.v10n3p1
[4] Nation, I. S. P. (2013). Learning vocabulary in another language (2nd ed.). Cambridge University Press.
[5] Coxhead, A., & Ng, S. H. (2020). The role of prior vocabulary knowledge and reading proficiency in second language vocabulary learning. Studies in Second Language Acquisition, 42(2), 387-411. https://doi.org/10.1017/S0272263119000456
[6] Mwakanyamale, E. M., & Callender, M. (2020). Vocabulary and reading comprehension of learners in English: A comparative study of Tanzanian and British primary schools. Educational Studies, 46(3), 334-350. https://doi.org/10.1080/03055698.2020.1749012
[7] Zheng, X., & Joshi, R. M. (2021). The relationship between vocabulary and reading comprehension for low-achieving adolescent readers in a Chinese context. Reading and Writing, 34, 741-765. https://doi.org/10.1007/s11145-020-10160-4

[8] Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in Education: A Systematic Mapping Study. Educational Technology & Society, 18(3), 75-88.
[9] Rottmann, T., & Kappas, A. (2020). The effect of spaced repetition on the acquisition of vocabulary in an unfamiliar language. Journal of Educational Psychology, 112(8), 1605-1620. https://doi.org/10.1037/edu0000419

Hybrid Biology Teaching and Learning Module

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ABSTRACT

The global COVID-19 pandemic of 2020 has affected and altered the landscape of the educational system. Online distance learning has become the main method of teaching and learning, as social interactions were required to be drastically reduced. Entering the endemic phase of COVID-19, academia was urged to revert to face-to-face methods, leaving behind the virtual teaching and learning. This study proposed an innovative and comprehensive hybrid teaching and learning module for Biology courses that adapted both methods; Method A (Face-to-face) and Method B (Virtual). The purpose of developing the hybrid teaching and learning module is that it can serve as an academic guideline that can be instantly referred to and applied in the teaching and learning process when encountering the need for teaching and learning in isolation such as the occurrence of sudden catastrophes, another pandemic, or floods. A 5-point Likert scale engagement survey was given to 114 science foundation students of UiTM to evaluate how the hybrid approach affects their cognitive and emotional engagement levels in studying biology subject. The data revealed that 65.8% of students agree that online virtual teaching and learning materials uploaded on the YouTube and UiTM UFuture platforms are convenient and beneficial to aid and complement face-to-face teaching in the classroom.

Keywords: Biology**;** Face-to-face Method; Online Method; Hybrid Method

INTRODUCTION

Diversification in teaching and learning approaches exists as every student has a unique learning nature with diverse personalities, learning wavelengths, and abilities [1]. In every teaching and learning session, the educator aims to ensure all the knowledge is well delivered while the learners perceive, process, store, and recall what they are attempting to learn most efficiently and effectively. However, ironically, there are no specific teaching and learning styles that are relevant to science education, especially in biology education [3].

This hybrid method was introduced to be applied during unexpected situations such as disasters or another pandemic wave that required remote teaching more than face-to-face [3]. The emergence of various online platforms is also considered an advantage in education systems as it integrates student-cantered learning and technology. Other than that, the old traditional way of biology teaching such as giving lectures using PowerPoint slides or memorizing concepts from books and lecture notes is considered mainstream and seems to grasp less students' attention during the learning process. The conventional and passive way of learning in the classrooms where information is organized and presented to the students by their teacher, limit their understanding of Biology without dynamic interaction of thought processes and skills.

As teaching and learning biology at the pre-university level has been taught for more than a decade since new teaching approaches must be adapted to capture Generation Z students' interests in learning biology. The biology subject must be taught creatively, incorporating both the conventional teaching, and learning method and also at the same time making full use of the wide variety of online and digital software and applications that are available for academicians to fully utilized in developing interesting and innovative teaching materials, which at the same time encourages students to engage actively during the learning process.

The use of different constructive tools and online platforms such as Massive Open Online Courses (MOOCs), UFUTURE, YouTube channel offers a wide variety of platforms for instructors to develop various learning activities, for instance, pre-recorded lectures and lab demonstration videos, animation videos, interactive quizzes, and discussion forums. Furthermore, online learning platforms also promote students to have critical and constructive academic discussions among peers and thus, instilled critical thinking among students.

INNOVATION DEVELOPMENT

In teaching biology, there are three crucial teaching modes which include lecturing mode, tutorial mode, and laboratory mode. The lecturing mode requires lecturers to give lectures based on the course outline and syllabus provided by the faculty. For the tutorial mode, it is the session where two ways communication occurs between the lecturer and students to discuss together the topics that were taught during the lecture sessions. During the tutorial session, students were also given exercise questions to practice answers to test their understanding of the topics taught during the lecture. The laboratory mode is the session where students carry out experiments to apply the knowledge that they have gained during the lecture and tutorial sessions.

In the conventional teaching and learning approach, all three modes of teaching were carried out in the classroom and the laboratory. This approach to teaching and learning is designated as Method A – Face to face method.

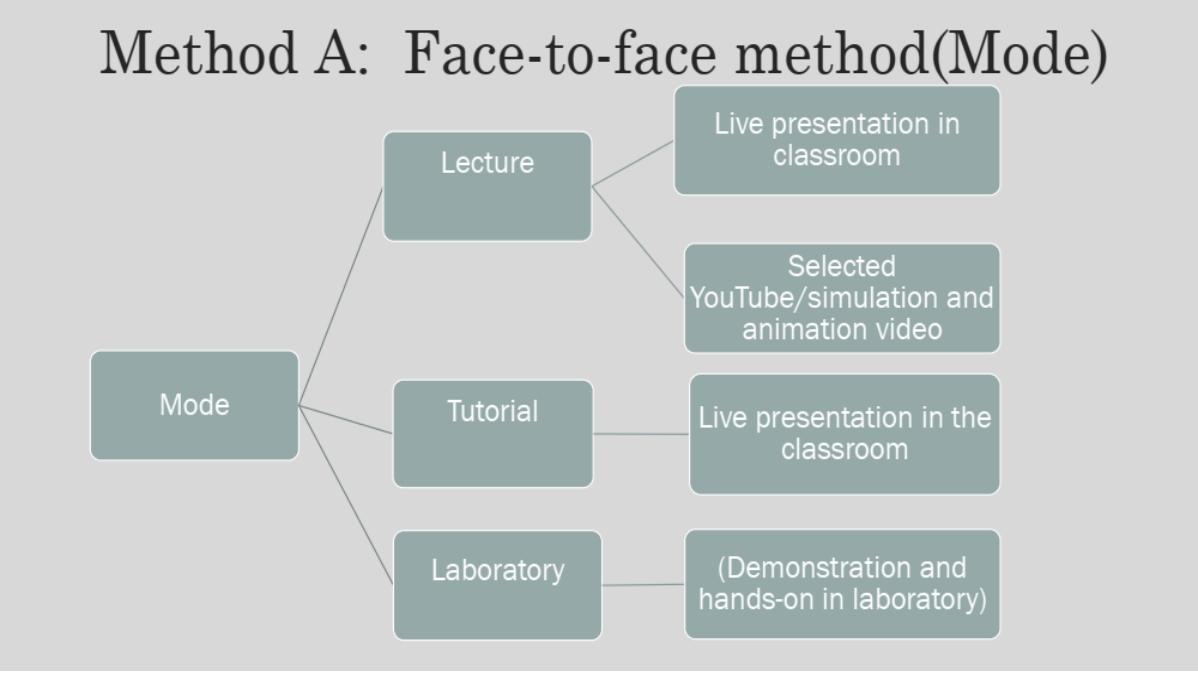


Figure 1: Method A – Face-to-face method to teach and learn biology

The students' assessments for Method A were as usual involved students being assessed via quizzes, tests, and final examinations that were carried out either in the classrooms or in the examination halls. Students were required to write laboratory reports and submitted a hard copy of the reports to their lecturers. Students are also required to give a project presentation in the classroom.

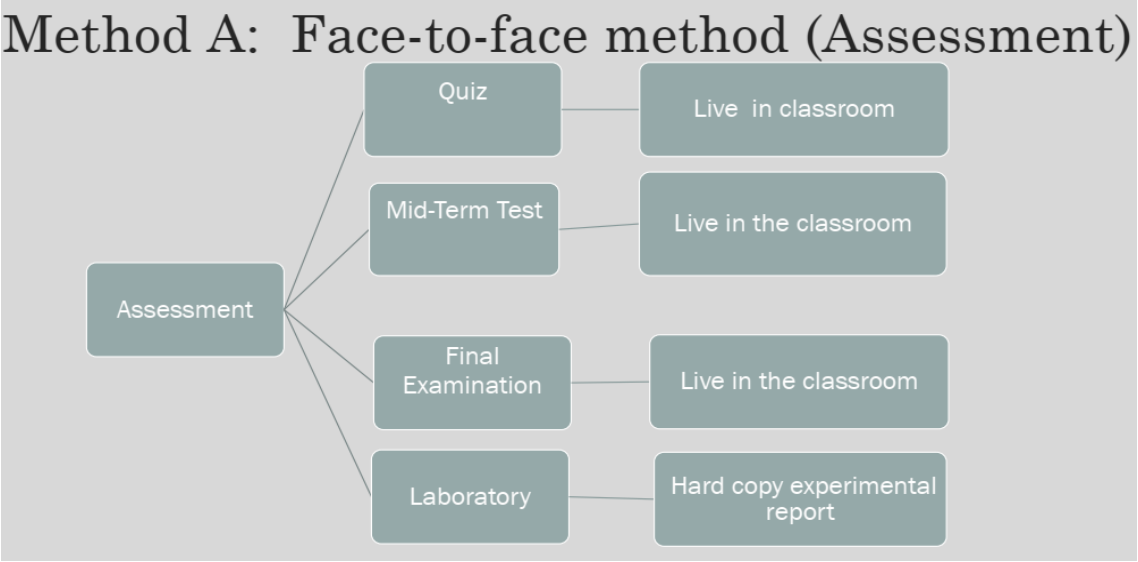


Figure 2: Method A Student Assessment – Face-to-face method

During the Covid-19 pandemic, when all the teaching and learning processes were drastically converted to online distance learning, making use of all the available digital and online software, applications, and platforms. This teaching and learning approach is designated as Method B – Virtual Method.

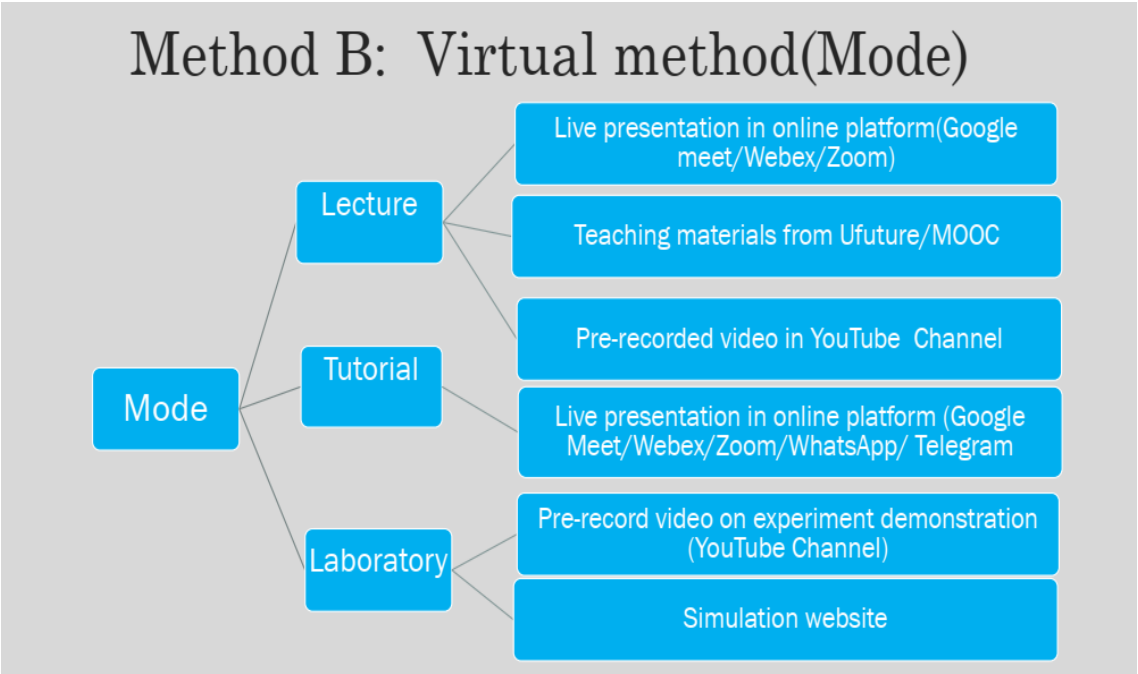


Figure 3: Method B – Virtual method to teach and learn biology

The students' assessments for Method B require all the assessments (quizzes, lab reports, tests, presentations, and final examinations) to be carried out virtually. Quizzes were carried out using the UiTM UFUTURE platform. The UFUTURE platform provided by UiTM was convenient to carry out the quizzes, as the system allows students to access the quiz anytime and anywhere. The system also allows the lecturer to monitor and trace students individually whether each student has taken the quiz within the allocated time. Google Classroom was the most used platform to carry out tests and final examinations, as students will submit the softcopy of their answer paper individually using their Student's Google account within the pre-set examination hour. A softcopy of the lab reports was also submitted via Google Classroom.

Throughout the Covid19 period, it was observed that the wastage of using a lot of paper to print out tonnes of test and exam papers to give out during the examination was reduced drastically as these assessments were carried out online. This assessment approach surely saves many trees from being cut down to make paper. This approach would give a positive impact on the environment and reduce the greenhouse effect.

Another positive impact of assessments being carried out via online platforms was that lectures do not have to allocate a lot of rooms to store all the hardcopy of students' answer papers that are private and confidential.

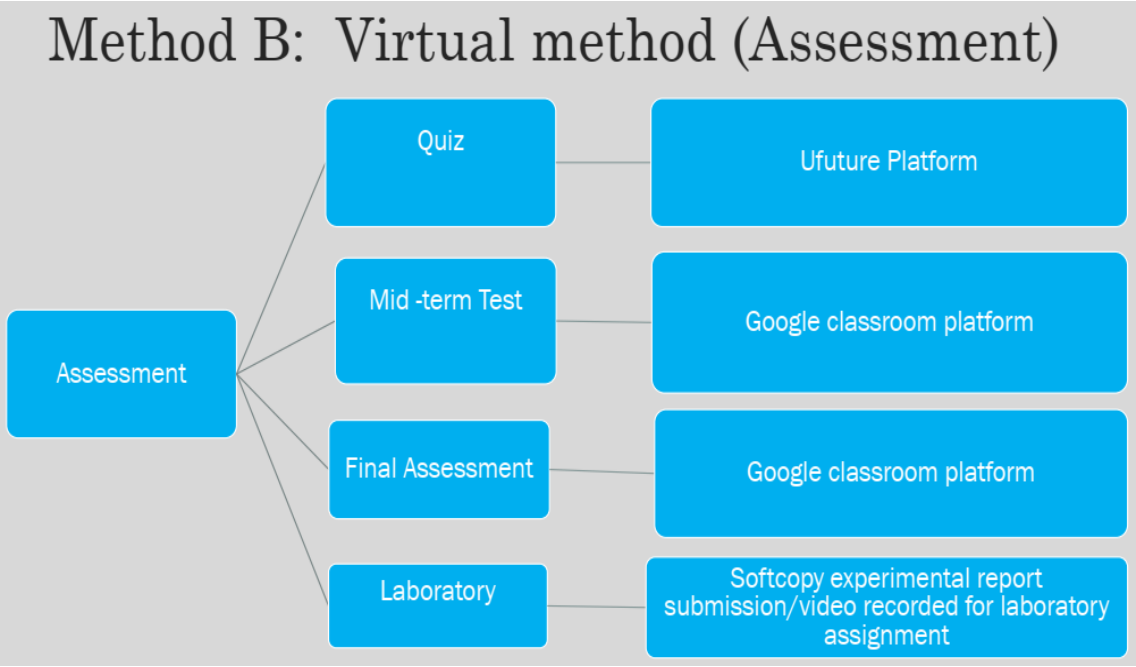


Figure 4: Method A Student Assessment – Face-to-face method

A new innovative approach to teaching and learning biology is developed which combines both Method A (Face-to-face) and Method B (Virtual). This teaching and learning approach is designated as Method C – Hybrid method. The hybrid method of teaching and learning biology offers flexibility for lecturers as academicians to choose the most convenient approach to deliver lectures and tutorials and carried out experiments during the lab sessions. The students' welfare during the learning process also must be highly considered so that the hybrid method will not burden the students and most importantly will give the utmost benefits to students to learn biology in the most convenient, effective, and interactive ways.

The Framework for Method C – Hybrid Method of Teaching and Learning Biology Modul

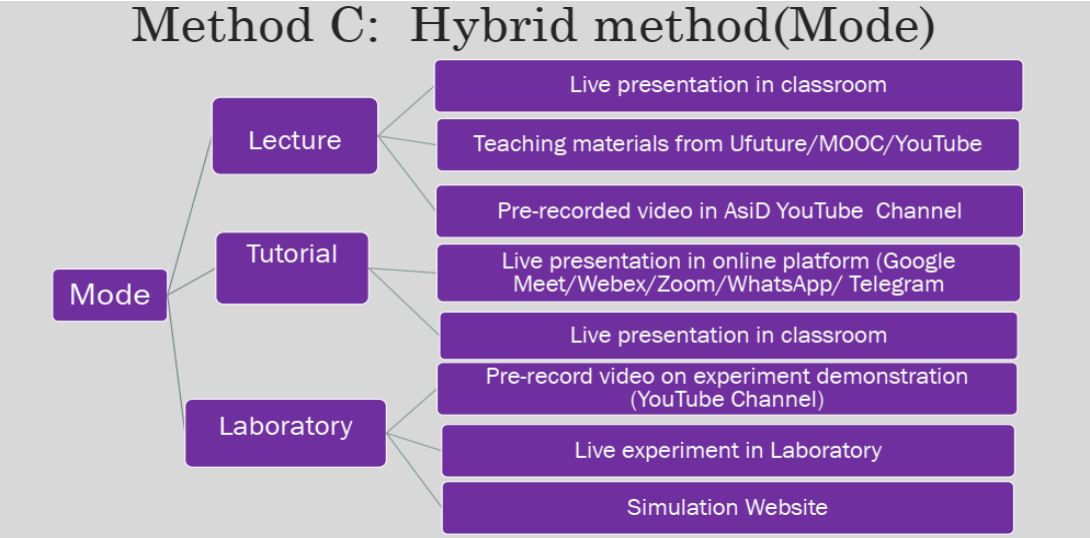


Figure 5: The merge of Method A and B to produce Hybrid Method (C) in teaching and learning mode

The hybrid method introduced from this innovation will be a functional and beneficial module that provides a framework that can serve as an instant guideline to be adapted to teach and learn biology in many circumstances. For example, this hybrid module can be applied during the occurrence of a catastrophe, such as the outbreak of another pandemic, or flood disaster, and all these situations require teaching and learning to be carried out remotely or in isolation [4].

During the Covid-19 pandemic, academicians experienced incredibly challenging situations which requires them to promptly adopt an innovative approach to teaching biology remotely and at the same time make sure that students are also well guided in the learning process from afar. During the initial period of the Covid-19 pandemic, most academicians especially in the field of science were not very aware and familiar with online and virtual learning. They struggle extremely hard to understand and apply all the available software, applications, and platforms to convert all their teaching materials and assessments digitally and virtually. The conversion of all these teaching materials and assessments must also be conveniently and easily accessible to all students.

To have an interactive hybrid mode to aid this unforeseen situation, academician uses a YouTube Channel as a platform to facilitate and enhance the teaching of Biology classes. On this channel, pre-recorded lecture videos and lab demonstration videos are put together and published for respective students. Videos are arranged based on chapters with subtopics looped into playlists. Even though Covid-19 is currently in its endemic phase, these teaching and learning videos are available and easily accessible to students, and this is a huge benefit in that it is an online tool that complements the existing face-to-face classes.

Entering the endemic phase of Covid-19, most academicians were very well knowledgeable and skilful in the adaptation of online distance teaching and learning. Hence this Hybrid Method is advantageous to be adopted in various needed situations to improvise teaching and learning strategies

As academicians, we are required to not also teach but also contribute to the development and spread of new knowledge. Academicians are required to do research, write, and publish to prosper new knowledge to society. To accomplish this, it requires a lot of time and effort. Hence this hybrid method of teaching and learning allows academicians to teach and at the same time achieve the stated goals.

This is because the Hybrid method allows academicians to have the flexibility to choose the appropriate teaching modes, which can be a merge between face-to-face learning and at the same time using online platforms to deliver teaching materials, such as pre-recorded lecture videos uploaded on YouTube. Once the pre-recorded lecture videos are available on YouTube, students can easily access these videos at anytime and anywhere to aid in their revision.

This goes the same for the student's assessments where for example, instead of giving quizzes in the classroom, quizzes can be given via the UFUTURE platforms, but can still maintain the final examination to be carried out face-to-face in the examination hall.

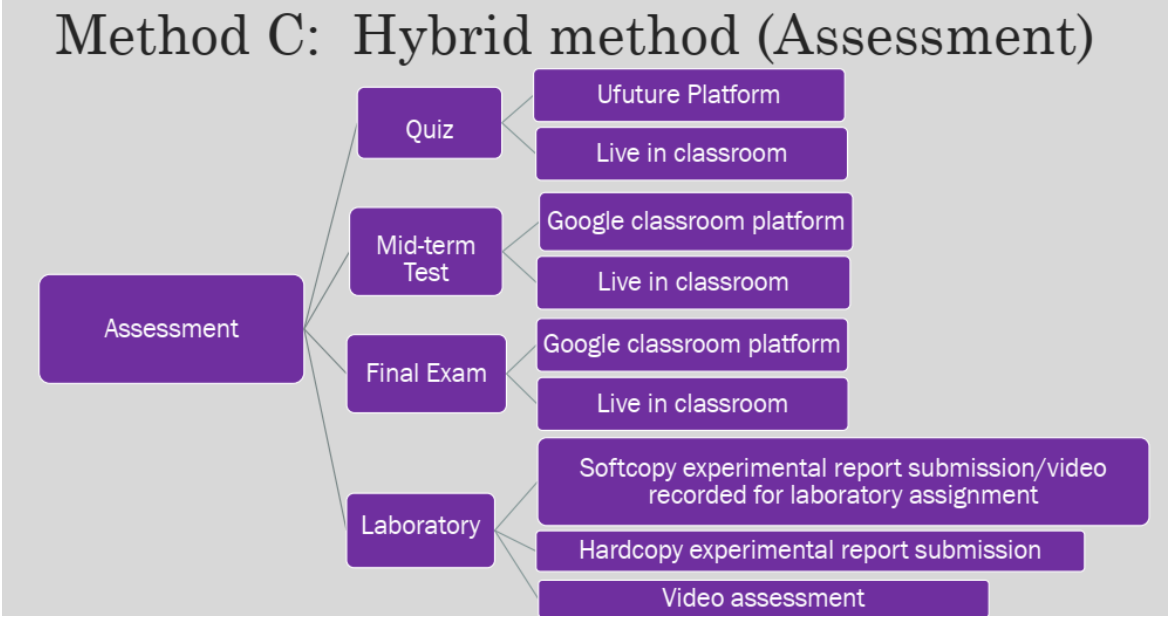


Figure 6: The merge of Method A and B to produce Hybrid Method (C) in the Assessment approach

For the Hybrid method to be efficiently adopted and applied, the lecturers responsible to teach the course must carefully plan the teaching and learning mode and the student assessment approach, making sure both parties; the lecturers and especially the students' welfare will not be jeopardized in any way.

The hybrid approach also highlights the assessment strategy for the students. Academicians and students have the flexibility to choose the easiest and most cost-effective strategy method to execute their assessment. There are plenty of online platforms that provide many friendly users with software and application tools to carry out live presentations creatively and interactively rather than the typical PowerPoint presentation in the classroom.

It is well-known that the challenge for science-based courses like biology is to execute effective laboratory teaching and learning without actual hands-on activity. Thus, an excellent virtual laboratory for certain experiments must be implied, thus students could benefit from the laboratory session even without a face-to-face session. Effective interactive videos for experimental purposes could be beneficial to give an overview of the laboratory work even without actual hands-on activity.

A survey has been done involving 114 science students on their preference for the online method of teaching and learning Biology. Table 1.0 represent the descriptive data. Many of the respondents were female students (n=93, 82.3%) and many of them spent 31 minutes to 1 hour studying using online learning materials. The preference of students drastically changes to choose more face-to-face learning in the classroom during this endemic phase (n-69, 60.5%), however, this is followed by the students' preference for both methods (Method C, a merge between both Face-to-face and Online). The results also show that if a catastrophe were to occur and requires the need to teach and learn remotely, online mode (Method B) is most preferred by the students (n=78,68.4%).

Table 1: Descriptive data of the respondents' preference toward Online Learning

Items		**n**	**Frequency**
Gender	Female	93	82.3
	male	20	17.7
Time Spending for Online Study	<30 minute	27	23.7
	31 minutes -1 hour	46	40.4
	>1 hour	38	33.3
	None	3	2.6
Preference for learning sessions of lecture and Tutorial	Face to Face Classroom	69	60.5
	Online	5	4.4
	Both	40	35.1
Preference for learning sessions of lectures and Tutorial during Catastrophe	Face to Face Classroom	12	10.5
	Online	78	68.4
	Both	24	24.1
Duration of watching ASID BIOLOGY YOUTUBE CHANNEL	<30 minute	37	32.7
	31 minutes -1 hour	45	39.8
	>1 hour	14	12.4
	Not watching	17	15

The data also determined that 65.8% of students agree that online learning videos available on YouTube, and learning materials obtained from the UFUTURE platform are very much useful to the students to aid in their study and revision.

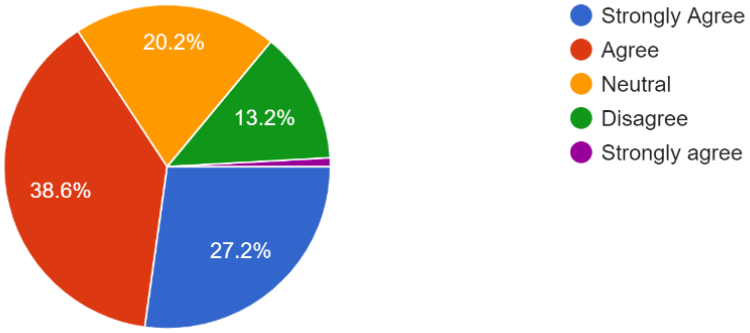


Figure 7: Usefulness of online method

Besides, 50.9% of the respondents agree that they enjoy watching pre-recorded lecture videos that are easily accessible to them from ASiD Biology YouTube Channel.

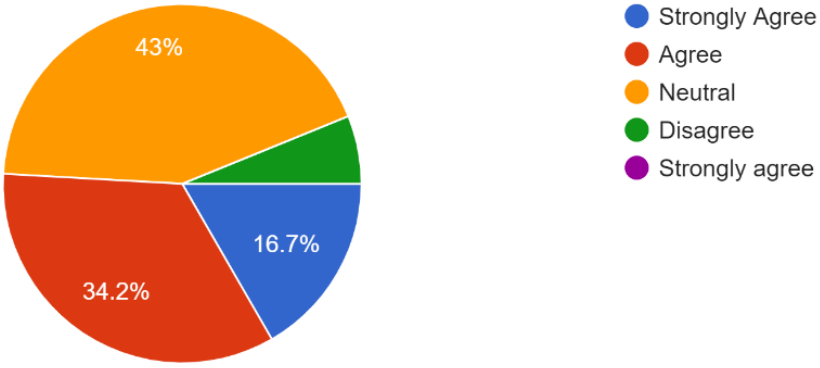


Figure 8: Preferences of students on video

COMMERCIAL POTENTIAL

The Interactive YouTube Channel.

The use of YouTube channels in teaching is knowingly beneficial in the education field. Inevitably, ASiD Biology YouTube Channel has benefited and positively impacted many students during the Open Distance Learning experience. The channel equips students with ubiquitous learning which can be accessed anywhere and can be watched repeatedly anytime throughout the day via various customized shortened URL links and QR codes. To date, the channel has attracted almost 3000 subscribers worldwide. The content does not just attract local students from diverse institutions in Malaysia with the same mode of the program, but it also provides useful teaching materials for international academicians and students worldwide.

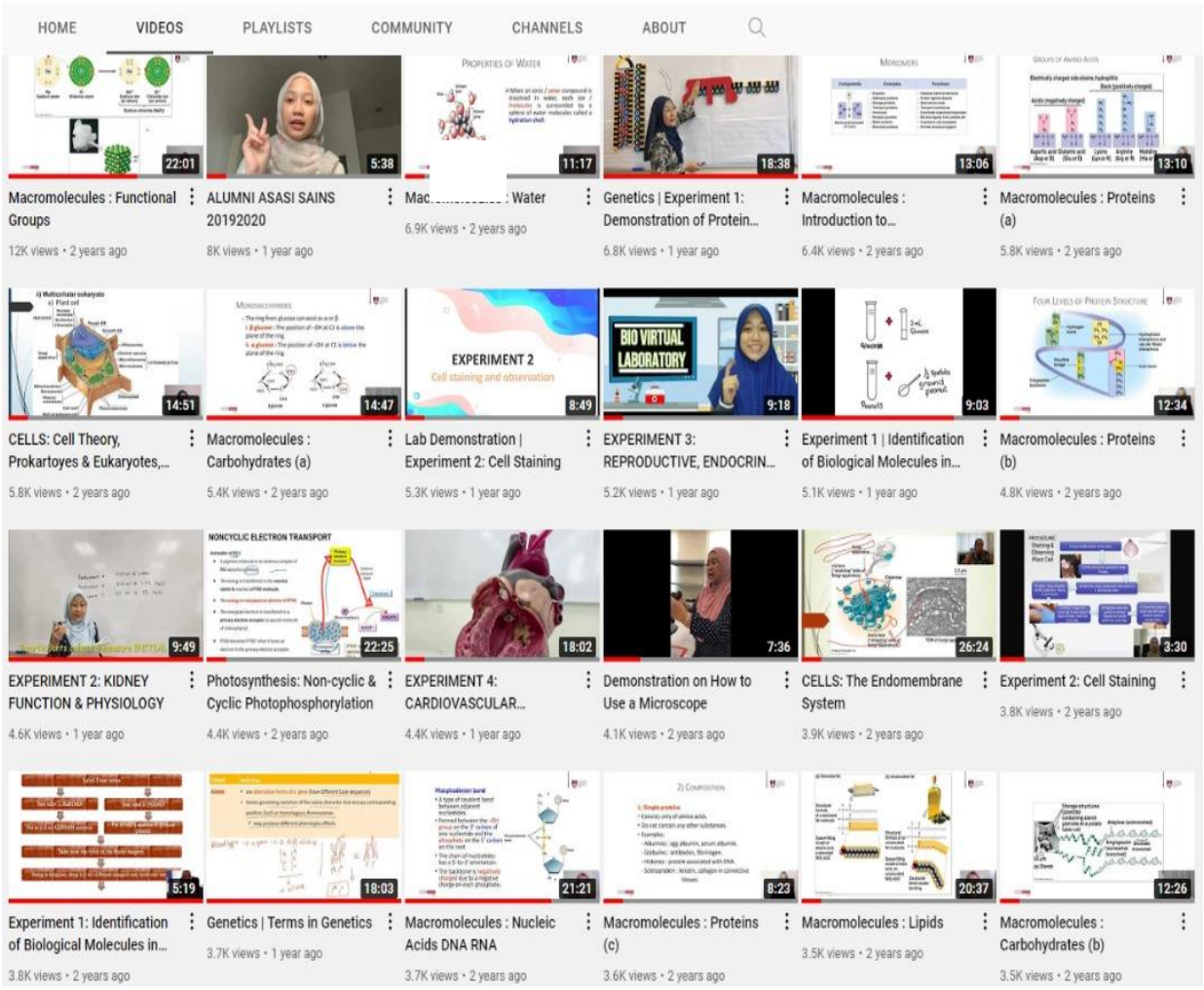


Figure 9: Interactive Video content on ASiD Biology YouTube Channel

Geography	Views ↓	
Total	**295,041**	
Malaysia	271,032	91.9%
India	1,248	0.4%
Philippines	184	0.1%
United States	91	0.0%
Zambia	69	0.0%
Pakistan	46	0.0%
United Arab Emirates	32	0.0%
Ukraine	28	0.0%
Ethiopia	25	0.0%
Bangladesh	21	0.0%
Indonesia	12	0.0%
Palestine	11	0.0%
Egypt	10	0.0%
Zimbabwe	10	0.0%

Figure 10: Worldwide ASiD Biology YouTube Channel viewers

Promote long-life learning of Biology in the Education Industry.

Biology is an interesting field of study that complies with both the theoretical and experimental of living things [5]. In many institutions, virtual learning looks impossible for laboratory and experimental-based fields. With the hybrid method, this perspective is invalid and virtual laboratory is complimentary to the common hands-on biology teaching and learning. It thus promotes that, biology experiments can be conducted by a touch of the fingertip, anywhere at any time.

CONCLUSION

The education field especially in the field of Biology, must move along with the ever surge of the latest development of technology especially in the use of digital and virtual approaches to teaching and learning. Academicians must be brave and explorative to deliver the most interesting and effective ways of learning biology incorporating both conventional teaching and

learning face-to-face in the classroom and merging with the latest technology to produce interactive and creative digital and virtual teaching and learning materials. This approach of combining both the 'old' and 'modern' ways of teaching and learning has lots of benefits and must be implemented in the education field to benefit all parties especially the students and the academicians.

ACKNOWLEDGEMENT

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REFERENCES

[1] Lopez, Omar. (2007). Classroom Diversification: A Strategic View of Educational Productivity. Review of Educational Research - REV EDUC RES. 77. 28-80. 10.3102/003465430298571.

[2] Ocayo, Carlo. (2022). Learning activities in grade 8 biology based on students' learning preferences. International Journal of Research Studies in Education. 11. 10.5861/ijrse.2022.340.

[3] Kounenou, K., Giannoulas, A., Stampoltzis, A., Kalamatianos, A., Kourmousi, N., & Pezirkianidis, C. (2022). Perspectives on Emergency Remote Teaching during COVID-19 Pandemic in a Sample of Greek Undergraduate Students: The Role of Self-Image. International Journal of environmental research and public health, 20(1), 172. https://doi.org/10.3390/ijerph20010172

[4] Adedoyin, Olasile & Soykan, Emrah. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. Interactive Learning Environments. 31. 1-13.10.1080/10494820.2020.1813180.

[5] Peters, MA & Rizvi, F & Mcculloch, Gary & Gibbs, Paul & Gorur, Radhika & Hong, M & Hwang, Y & Zipin, Lew & Brennan, M & Robertson, S & Quay, John & Malbon, J & Taglietti, Danilo & Barnett, Ronald & Chengbing, W & Mclaren, Peter & Apple, R & Papastephanou, Marianna & Burbules, N & Misiaszek, L. (2020). Covid-19, education, and the new abnormal.

Preparation of Casein Protein-Based Bioplastics at Different Temperatures and Percentage of Acid Used

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ABSTRACT

The purpose of this study was to prepare casein protein-based bioplastics for biodegradable plastic materials application. Casein was extracted from spoiled cow milk heated at different temperatures (40 °C, 50 °C and 60 °C) and amount of acetic acid was varied (1 ml, 5 ml and 10 ml). By adjusting the extraction parameters of casein, two different types of protein-based bioplastics were produced: smooth and rough surface polymers. The preparation by using this technique can be beneficial as it is the most convenient and cost-effective process. These bioplastics have high potential for development of biodegradable plastic; the challenge of solid waste management can be wisely controlled if the plastics that are being used made up of waste material such as casein from the spoiled milk.

Keywords: Casein; plastic; biodegradable; spoiled milk; polymer

INTRODUCTION

Plastics are widely used to keep resources for human utilization. Due to the plastic's characteristics of being flexible, smooth surface, and lightweight, it can be moulded in various shapes. Almost 300 million tons of plastic each year worldwide [1], which is nearly equivalent to the amount of the whole human population. Besides reducing plastic use, making biodegradable plastics is the most effective ways to prevent this waste.

Casein is a significant component of a protein in milk. It is a family of related phosphoproteins which has variety of uses such as main component of cheese to being used as food additives. The regular form of casein is sodium caseinate, which can bind and organize a lattice like a polymer structure. Previous study reported that when milk is heated and an acid is added, the casein molecules unfold and restructure into a long chain [2]. The study aims to prepare casein protein-based bioplastics from spoiled milk for biodegradable plastic materials application.

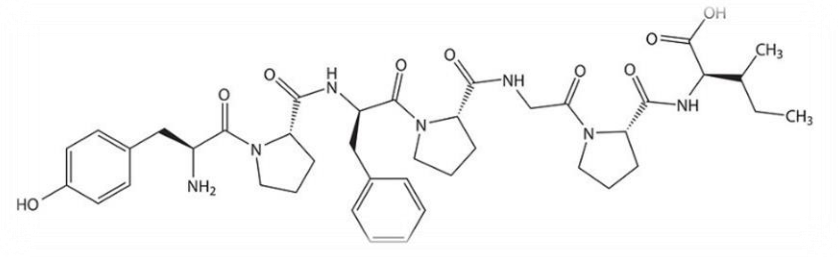


Figure 1: Casein structure

INNOVATION DEVELOPMENT

The study used an experimental research design where the casein was extracted from spoiled cow milk heated at different temperatures (40 ^{o}C, 50 ^{o}C and 60 ^{o}C) with 5 ml of 0.1 moldm^{-3} acetic acid. The highest production of the yield was at 60℃ which is 3.85 g. This temperature is slightly higher than the other temperatures that have been reported [3]. It can also be observed that the yield in both temperatures listed (40 ^{o}C and 50 ^{o}C) has lower yields. The coldest temperature at 40 ^{o}C yielded only 2.11 g of casein, while the temperature at 50 ^{o}C, has 3.05 g.

The amount of acetic acid used in coagulating the milk components is also determined. Given the desired temperature which is 60℃, a test on the amount of acetic acid is then being carried out. Another 3 sets of spoiled milk with different amounts (1 ml, 5 ml, and 10 ml) of acetic acid are subjected to casein extraction. Extraction of using 1 ml acetic acid shows no casein coagulation process occurred. The yield of casein by using 5 ml and 10 ml declined from 3.83 g to 3.35 g respectively. Smooth surface structure (Figure 4) of plastic produced using 5 ml acetic acid indicates the coagulation process took place slowly and organized a uniform layer structure. Meanwhile, the rough surface (Figure 5) of plastic produced when higher amount of acetic acid used; 10 ml.

The casein prepared from the best temperature set-up and best acetic acid amount were allowed to dry up. After a series of observation to the output, it was found that it is fully harden after 2 days.



Figure 2: Casein extraction process



Figure 3: Casein of spoiled milk

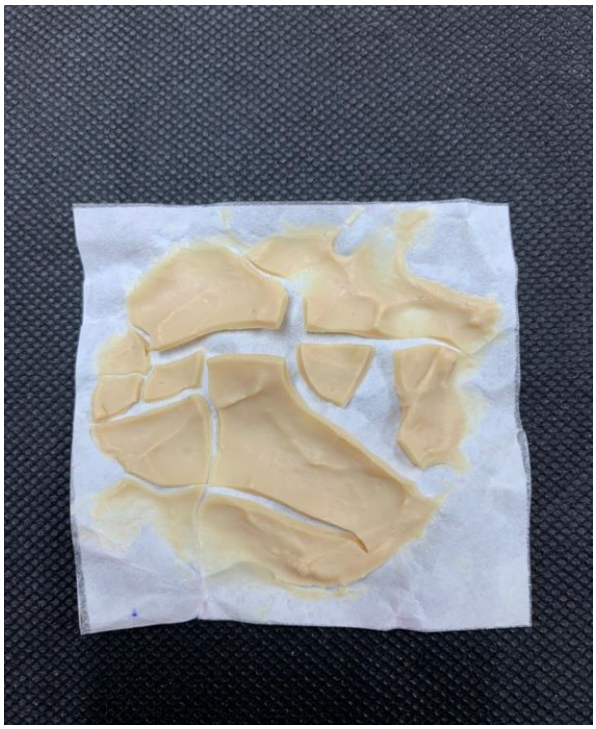


Figure 4: Plastic (dried casein) prepared at 60℃ using 5 ml of 0.1 moldm^{-3} acetic acid



Figure 5: Plastic (dried casein) prepared at 60℃ using 10 ml of 0.1 moldm^{-3} acetic acid

COMMERCIAL POTENTIAL

Plastics are widely used because they are durable and require low cost [4]. Unfortunately, these became a serious issue as they were not disposed properly and may harm and contribute to pollution. Food waste, such as spoiled milk is considered as a versatile substitution material against hydrocarbon to produce plastics [5,6]. The combination of acids and heat encourage to lift the protein casein from the milk [7]. This type of plastic is environmentally friendly because it is biodegradable which will naturally decomposed, unlike plastics that are made from petroleum products which requires very long time and high cost to decomposed.

Hence, the study utilized spoiled milk into biodegradable plastic since it is cost-efficient to produce a container to store dry goods and resources. The challenge of solid waste management can easily be done if the plastics that are being used in our daily lives are made up of simple materials [8] such as casein from milk.

CONCLUSION

It was found that to extract casein from milk, there are parameters needed to be observed such as temperature and amount of acetic acid required to be added to the milk. From the experiment conducted, the optimal temperature can be used is at 60℃ using 5 ml acetic acid tends to derive a higher yield of casein and smooth surface of plastic.

ACKNOWLEDGEMENT

The researchers want to show eminent gratitude towards the people who have considered to help us in finishing this research paper throughout the process. Thanks to lab assistants of Chemistry Lab Universiti Malaysia Terengganu, for allowing the researchers to conduct the experiment in the laboratory that is undoubtedly a significant contribution in the process.

REFERENCES

[1] Courtney Lindwall. (2020). Single-Use Plastics 101. Retrieved January 9, from https://www.nrdc.org/stories/single-use-plastics-101#what
[2] Rowland & Rutz (2018). Turn milk into plastic: STEM Activity. Science Buddies. Retrieved from http://www.science buddies.org/stem-activities/milk-into- plastic
[3] Marivic Wagan (2019). Casein Extraction from Milk: Utilizing kitchen materials as a source of biodegradable plastic. Ascendens Asia Journal of Multidisciplinary Research Abstracts, Vol. 3 No. 2C
[4] Downs (2018). How long can you leave milk out of the fridge? Best Food Facts. Retrieved from http://www.bestfoodfacts.org/uh-oh-who-left-the-milk-out/
[5] Elodie C., Gilles A., Frédéric P. & Nadia O. (2018). Development and characterization of a novel edible extruded sheet based on different casein sources and influence of the glycerol concentration. Food Hydrocolloids. Volume 75, Pages 182-191
[6] Imane B., Frederic P. & Gilles A. (2019). Production and characterization of sodium caseinate edible films made by blown-film extrusion. Journal of Food Engineering. Volume 121, Pages 39-47
[7] Brooke-Taylor S, Woodford K. & Kost N. (2017). Systematic review of the gastrointestinal effects of A1 compared with A2 β-Casein. Advances in Nutrition, 8: 739-748
[8] Rijnkels M. 2012. Multispecies comparison of the casein gene loci and evolution of casein gene family. Journal of Mammary Gland Biology and Neoplasia, 7: 327-345

Beethoven Light Improve Image Quality by Complying to Breathing Instruction for Patient with Hearing Impairment in Cardiac MRI

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ABSTRACT

Cardiac magnetic resonance imaging (CMR) is a medium to diagnose a wide range of heart conditions by using magnetic resonance imaging (MRI). To be able to perform the procedure; effective communication on breathing instruction is crucial in every CMR patient including those who have hearing challenges and language barrier. The patient needs to comply with the repetitive breathing instruction respectively. Failure to do so will lead to the verge of production of poor image quality of heart that has no diagnostic value and the physician having trouble diagnosing the patient's condition even worse leading to fatality and mortality. Hence, this is where Beethoven Light comes into a picture to overcome this problem. It is designed to be such a portable device and convenient handling that consist of only 2 colors of light: red and green. The Beethoven Light successfully could aid the patient with its simple instruction for those who cannot comply and bare breathing instruction especially patients that have hearing disability, elderly, and also communication and language barrier.

Keywords: CMR; MRI; Beethoven Light; magnetic resonance imaging; hearing challenge

INTRODUCTION

The cruciality of effective communication is obvious in any discipline of business including healthcare itself. Countless negative impact rooting from poor communication such as misdiagnose, wrong treatment and procedure, increase duration of procedure, delay essential treatment and even worse death of patients [8]. Cardiac MRI is one of the procedures in any healthcare centres that face this difficulty on a day-to-day basis whereby some patients having trouble due to cannot comply with breathing instructions as poor communication happens.

Cardiac MRI is an examination that evaluates the function and structure of the heart using an MRI machine ranging from congenital and acquired heart diseases, including cardiac masses, myocardial ischemia or infarction, coronary artery disease. However, the nature of the heart itself, respiratory motion and systolic ventricular blood complicate cardiac imaging [2]. It is because we need to gain an optimal image despite the sensitivity of MRI machine towards motion as these motions can cause artifact; a feature appears in an image that is not present in the original object and may be confused with pathology and some affecting quality image. Hence, to overcome these problems, MRI becomes a demanding examination. Multiple breath-hold instructions will be given and last for a long examination time [1].

Although the multiple breath-hold instruction is simple and repetitively; deaf patients, elderly and foreigners found it difficult to understand and comply with instruction. Such situation makes them contraindicated for MRI as they are unable to stay still and obey instruction and the image produced will be suboptimal, restrict the interpretation, decrease the

accuracy of report [4] and in some cases if cannot be helped the case will be abandoned and re-appoint. Moreover, there are many articles that depict the gap of communication between these groups of patients with healthcare professionals. For example, incidents of the largest cluster of COVID-19 in Singapore the radiographers meet difficulties to perform Chest X-ray as the patient which is foreign workers native language is not English. The rejection rate in their hospital shows a dramatic increment of rejection. Second, an article by Yahya Y. Akeely,2022 "Communication Challenges While Dealing with A Deaf Patient in the Emergency Department and Suggested Solutions" showed that in the emergency department, they are having difficulties when dealing with deaf patients.

Beethoven Light

Thus, with Beethoven Light it acted as visual communication to overcome this problem. Visual communication is found to have great significance. It also could communicate with great speed and simplicity as it can access the whole world regardless of level of literacy or language origin [6]. One study in 2013 showed that doctors and patients interpreted data from medical test results more accurately when the information was presented visually, rather than numerically [3]. Taking road safety as an example, road users mostly obtain information visually. Because of the color, patients can clearly differentiate the natural forms [6]. In Beethoven Light: red means hold breath while green means breathe in. Plus, it is globally accepted that green means go, and red means stop [5] making it available to the whole world.

INNOVATION DEVELOPMENT

Before the innovation idea happened; we used two pieces of color paper to guide the patient for breathing instruction. It is quite a hassle as we need extra help from others to be inside the MRI examination room to repetitively show the color paper based on the instruction given to the patient. The product shown as below;



Our innovation development began with a complaint letter from Consultant Cardiologist (who interpreted the cardiac MRI image for patient diagnosis) regarding poor image quality due to breathing instruction incompliancy in Cardiac MRI. The letter shown below.



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Dr Hafisyatul Aiza Zainal Abidin
Pensyarah dan Pakar Kardiologi,
Disiplin Kardiologi,
Hospital UiTM.

Prof Dr Marlina Tanty Ramli Hamid
Ketua Jabatan,
Jabatan Radiologi,
Hospital UiTM. 2 November 2021

Prof,

ADUAN PENAMBAHBAIKAN IMEJ MRI JANTUNG

Merujuk kepada perkara di atas, saya selaku Pakar Kardiologi ingin membuat aduan mengenai masalah imej MRI jantung kebelakangan ini.

2. Untuk makluman Prof, pemeriksaan MRI jantung di Pusat Pakar Perubatan UiTM (PPUiTM) Sungai Buloh telah menunjukkan pola peningkatan yang mendadak. Imej dihasilkan perlu memenuhi kriteria yang ditetapkan agar mempunyai nilai diagnostik melalui pematuhan arahan pernafasan yang diberikan. Sekaligus, memudahkan Pakar Krdiologi untuk membuat laporan yang tepat untuk pesakit.

3. Namun demikian, kebelakangan ini PPUiTM telah menerima pesakit yang luar daripada kebiasaan yakni pesakit mempunyai masalah pendengaran (OKU dan sebagainya) dan terdiri daripada bukan warga tempatan. Untuk golongan pesakit ini menjalani prosedur adalah sukar memandangkan kepatuhan kepada arahan pernafasan adalah sangat rendah.

4. Justeru, usaha agar golongan pesakit untuk mematuhi arah pernafasan adalah mustahak agar imej yang dihasilkan mempunyai nilai diagnostik.

Saya memohon pihak Radiologi untuk mencari penyelesaian bagi permasalahan ini. Saya berharap agar pihak Prof dapat memberi kerjasama dalam menangani masalah ini.

Sekian, terima kasih.

Yang benar,

(Dr Hafisyatul Aiza Binti Zainal Abidin)
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Due to the complaint letter above, a team known as “Beethoven Project” is created to find a solution for this problem. It consists of staff from both Radiology and Cardiology Department UiTM which work hand in hand during cardiac MRI procedure. After various brainstorming during our meeting session, Beethoven Light had come to light. Its main goals are to improve image quality and breathing instruction compliance in Cardiac MRI. Apart from that, Beethoven Light is proven to reduce the procedure time to be as comparable with normal patients for patients with hearing difficulty. Subsequently, it helps to reduce wastage of MRI consumables items if patients cannot obey the instructions like wastage of contrast media which cost more than RM 100 per case.

The Beethoven Project had proposed two prototypes to solve the problem regarding the incompliancy on breathing instruction.

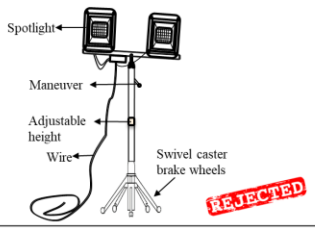
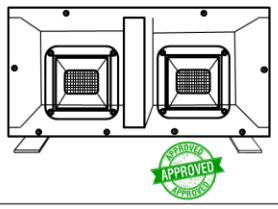
	SUGGESTION 1	SUGGESTION 2
DRAFT		
PROS	• Portable	• Portable • Lightweight • Small in size and can be place at the shelf in front of MRI screen. •Easy to use with light switch
CONS	• Cannot be used inside MRI room because the wires (copper) can interfere with the MRI signal inside the MRI room which lead too degraded image quality. • Some parts of the prototype used metal which can be attracted to MRI machine.	

Figure 1: Comparison between 2 model

After weighing up the pros and cons, Model 2 is chosen

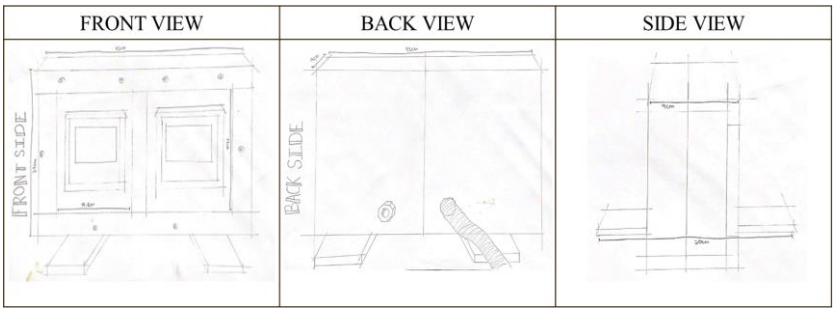


Figure 2: Preliminary Project Sketch

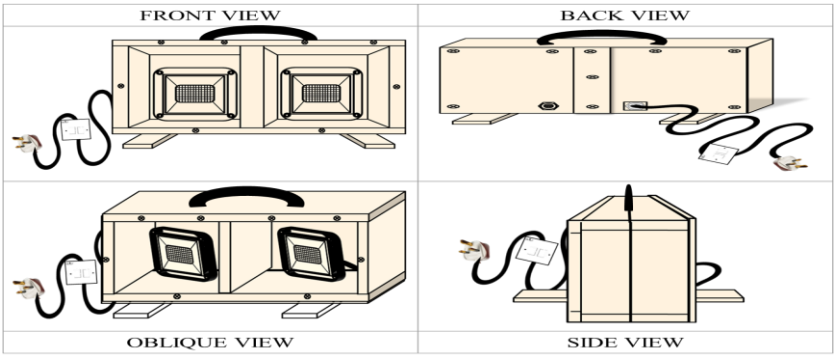


Figure 3: 3D Model Prototype

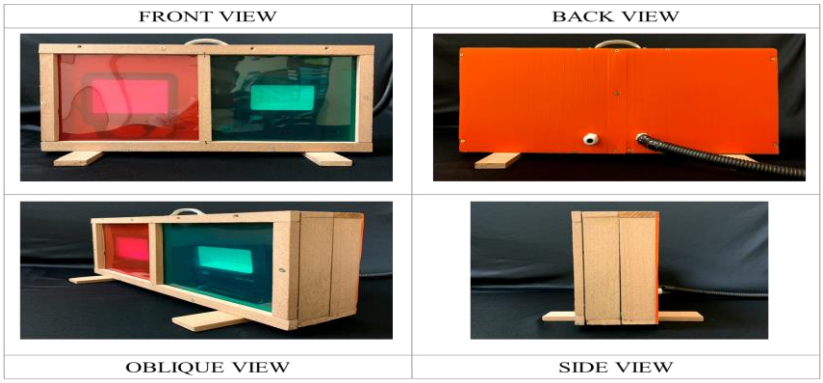


Figure 4: Actual Prototype

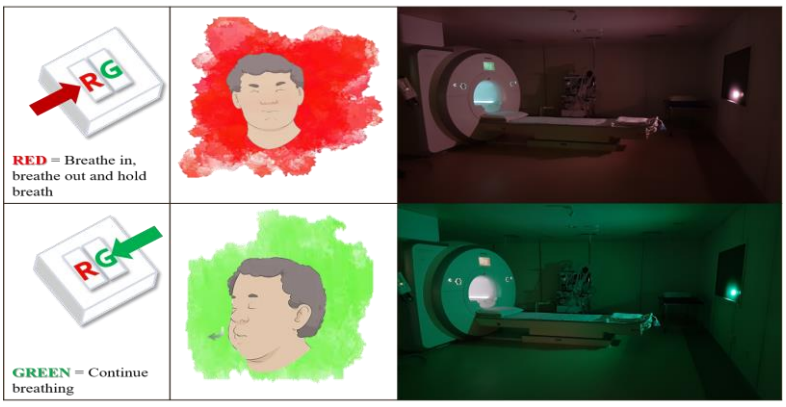


Figure 5: Demonstration of operational instruction

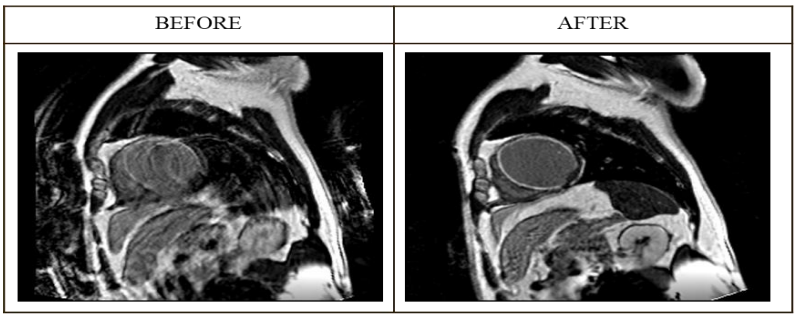


Figure 6: Post contrast cardiac MRI image before and after using Beethoven Light

COMMERCIAL POTENTIAL

Beethoven Light is capable of revolutionizing the healthcare market especially as it has the ability to make healthcare accessible to all. Like traffic lights it can be distributed globally. Our target market right now is the Radiology Department across Malaysia. We had received feedback from other colleagues in other healthcare centres and it was profound. We believe that it can cross globally as each healthcare centre usually has a Radiology Department. Our product is not limited to MRI only, it can be used in all modalities that require breathing instruction. (CT, X-ray). This can make healthcare organizations become more feasible for any type of patient.

Our sales strategy with local hospitals first, and partnership to upgrade with any partnership.

Table 1: List of prototype production material and price

NO	ITEM	QUANTITY	UNIT PRICE	TOTAL
1	PVC insulated cable blue 1.5mm	10	RM1.50 per meter	RM15.00
2	PVC insulated cable red 1.5mm	10	RM1.50 per meter	RM15.00
3	PVC nut box surface (3inch x 3inch)	1	RM0.50	RM0.50
4	PVC insulation tape	1	RM0.50	RM0.50
5	Flexible conduit wire loom sleeve	10	RM1.00 per meter	RM10.00
6	13A 3 pin plug top socket (SIRIM)	1	RM4.50	RM4.50
7	2 gang 1 way switch (SIRIM) 1	1	RM12.00	RM12.00
8	Osram Ledvance LED 20W Floodlight	2	RM30.00	RM60.00
9	Ceiling spin wood	10	RM1.50 per feet	RM15.00
10	Screws	1	Rm2.00 per packet	RM2.00
11	Nails	1	RM0.50 per packet	RM0.50
12	Handle drawer	1	RM0.50 per packet	RM0.50
13	PP corrugated board	1	RM6.00	RM6.00
14	A4 plastic folder file (red)	1	RM3.90	RM3.90
15	A4 plastic folder file (green)	1	RM3.90	RM3.90
			TOTAL	**RM149.30**

Our prototype cost is fully funded by the team members. Our team member, Mohamad Faizal Samsuni had built this product based on our sketch and 3D model prototype. Below shows the total cost of our prototype production.

- MATERIAL COST + LABOR COST + MISCELLANEOUS (UTILITY & TRANSPORTATION) = RM149.30 + RM54.72 + RM4.00
  TOTAL COST = RM208.02

As the prototype is going to be upgraded into a more sophisticated and sleeker look. We are very optimistic that Beethoven Light will come out into the market with a reasonable price that will profit us.

We had joined several competitions and received few awards as below;

1. Konvensyen Kumpulan Inovatif dan Kreatif UiTM Peringkat Zon Tengah (5th-7th September 2022)
   - Pengiktirafan emas
   - Anugerah KIK Primer Terbaik Inovasi Pengurusan (Penciptaan)
   - Anugerah KIK Primer Terbaik Inovasi Pengurusan Keseluruhan

2. Konvensyen KIK Kumpulan Inovatif dan Kreatif Peringkat UiTM 2022 (17th and 18th September 2022)
   - Penarafan Perak
   - Naib Johan Anugerah Poster Terbaik

3. Invention, Innovation & Design Exposition IIDEX 2022
   - Gold award: Inventor (Open) and Inventor categories.

We also had received intellectual property right (IPR) under copyright category by UiTM Bitcom. Currently, we are waiting for another IPR under the same category by MyIPO.

CONCLUSION

After the innovation of Beethoven Light, patients' compliance to breathing instruction during Cardiac MRI had a tremendous improvement. Besides, the time acquisition of Cardiac MRI and departmental expenses showed dramatic reduction. This concludes that Beethoven Light; visual communication can aid in effective communication between patient and healthcare professional and applicable to other modalities too. In addition, it led to more optimal diagnostic yield and delivered efficient examinations. This ultimately, making healthcare accessible globally and inclusive including those who have problems in communication especially one who has hearing challenge and language barrier.

ACKNOWLEDGEMENT

A token of appreciation to our advisor, Dr Hafisyatul Aiza Binti Zainal Abidin, our other beloved Beethoven Project members; Mohamad Faizal Bin Samsuni, Nurul Nadiah Binti Othman and Md Kamaruzzaman Abd Ghoffor, staffs or Radiology Department UiTM, individuals who are directly or indirectly involved in helping the Beethoven Project to make this innovative light a success and a special thanks to everyone who always support us during few months of running this project.

REFERENCES

[1] *Cardiac magnetic resonance imaging* (2023) *Wikipedia*. Wikimedia Foundation. Available at: https://en.wikipedia.org/wiki/Cardiac_magnetic_resonance_imaging (Accessed: May 6, 2023).
[2] Daniel T. Ginat and Michael W. Fong (no date) *Cardiac imaging: Part 1, mr pulse sequences, imaging planes, and basic anatomy.* Available at:

https://www.ajronline.org/doi/pdf/10.2214/AJR.10.7231 (Accessed: May 5, 2023).

[3] Gaudiano, P. (2015) *As it turns out, a picture is not worth a thousand words*, *Wired*. Conde Nast. Available at: https://www.wired.com/insights/2014/03/turns-picture-worth-thousand-words/ (Accessed: May 6, 2023).

[4] Maryam ghadami (2022) *National Center for Biotechnology Information*. Available at: https://www.ncbi.nlm.nih.gov/books/NBK551669/ (Accessed: May 6, 2023).

[5] Samaniego, J. (2020) *Traffic signs don't depend on language – or do they?*, *Ferrovial*. Ferrovial. Available at: https://blog.ferrovial.com/en/2019/07/traffic-signs-dont-depend-on-language-or-do-they/#:~:text=Red%2C%20yellow%2C%20green,red%20is%20a%20mandatory%20stop. (Accessed: May 6, 2023).

[6] Singh, A. A., Hwang, S. J., Chang, S. C., & White, B. (2017). Affirmative counselling with trans/gender-variant people of color. In A. Singh & L. M. Dickey (Eds.), Affirmative counselling and psychological practice with transgender and gender nonconforming clients (pp. 41–68). https://doi.org/10.1037/14957-003.

[7] Treutlein, C. *et al.* (2019) *Complete free-breathing adenosine stress cardiac MRI using compressed sensing and motion correction: Comparison of functional parameters, perfusion, and late enhancement with the standard breath-holding examination*, *Radiology. Cardiothoracic imaging*. U.S. National Library of Medicine. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7977924/ (Accessed: May 6, 2023).

[8] The hippa journal (2022) *Effects of poor communication in Healthcare, HIPAA Journal*. Available at: https://www.hipaajournal.com/effects-of-poor-communication-in-healthcare/ (Accessed: May 6, 2023).

ChaCO-Ban: The Revolutionary of Eco-Charcoal Utilising Kitchen Food Waste

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ABSTRACT

The heavy reliance of traditional charcoal is worrying as this will continuously cut down the mangrove trees for its production. Major mangrove deforestation had affected not only the environment but also the socio-economic of the local community. To date, there have been several attempts to produce eco-friendlier charcoal (biochar). These studies had amplified from producing biochar for combustion into many other functions such as soil nutrients, carbon dioxide removal, catalysts and others. The aims of this study are to produce a biochar from the biomass domestic kitchen food waste (banana peel and orange peel) with minimal cost. Previous biochar production needed to use pyrolysis but this study used a domestic oven in order for the public to replicate this at home. This will not only be reducing the food waste in the landfill but also minimise the cost for charcoal production. To sum up, this study gave an early conclusion that biochar can substitute traditional charcoal for combustion and more studies needed to verify the usage of biochar for other purposes.

Keywords: Biochar; food waste; orange peel; banana peel

INTRODUCTION

Traditional charcoals are widely used global wide. They are traditionally made of mangrove trees. There are many advantages of using mangrove trees as the sources of charcoal such as long burn times, less smoke and low spark [5]. Most importantly, they are odourless. These made mangrove trees as the most suitable source for traditional charcoal [6]. However, there are many bad effects from using the traditional charcoal. One of them is degradation of mangrove areas [6]. Other than holding many important species, mangroves act as important wave breaker to protect the shoreline from soil erosion & maintaining water quality [7]. Continuing using mangrove trees as charcoal sources seemed to be disadvantageous as this is not sustainable. Prolong use of mangrove as charcoal had led to mangrove clearing in certain areas such as in Indonesia [10], Sri Lanka [9] and Malaysia [11]. This had caused soil erosion which will lead bigger cause. Biodiversity disruption is not the only effect caused by the deforestation, but also the gas emission will cause an adverse effect on air pollution. Commercial charcoal had proven to emit harmful substance such carbon dioxide, carbon monoxide, formaldehyde and acetyldehyde. Some emissions are mutagens such as formaldehyde (associated with nasopharyngeal tumours) and acetaldehyde.

Charcoal is not restricted for combustion only. There are many other functions of charcoal such as, act as catalyst, removal agent of phenol compound in water bodies, supplemented into domesticated animal's feed, whitening agents and bacteriological adherent for biomethanation of organic waste [13]. Apart from that, biochar (charcoal which is made from plant biomass) is

widely used in agricultural industries such as for fertility of lands and able to act as precursor for adsorbents in treating the water [2]. Hence it is very important to study more about the usage of biochar in daily life. The escalating demand in biomass energy had urge for more research on charcoal, preferably in producing eco-friendlier biochar. Thermogravimetric analysis (TGA) can be analysed in order to study this.

There are several points of view that needs to be look closer in substituting traditional charcoal into biochar. Some of them are the emission of carbon monoxide (CO), nitric oxide (NO) and hydrogen sulphide (H_2S). Other than that, the amount of heat energy released is important especial if the biochar is designed to be used as combustion fuel. Charcoal in general is produced by pyrolysis which requires expensive equipment. Furthermore, this cannot be done at home. This is not parallel to the concept of self-sufficient.

Second issue is the food waste generated all around the world. Food waste generated in Malaysia alone comprised of 44.5% out of 38, 142 tonnes of total waste per day in 2018 [8]. Rice contributes the most in the food waste. Many ways to avoid the food waste, either by prolonging the food shelf life by fermentation [14] or processing the food waste into something new to avoid getting the food waste at the landfill. This food waste biomass still contains a lot of energy left which and therefore should not be neglected carelessly [3]. Food waste should be converted into other energy-rich product such as energy pellet biochar, fuel and other products owing to their unique properties [1].

To date, there are several attempts of research in substituting traditional charcoal into eco-friendlier ones such as cellulose extraction from banana peel, faecal-sawdust char and bamboo. All of these, either utilising waste or using more sustainable resources such as bamboo. These made better alternatives than the traditional charcoal. Hence, this study aims to produce biochar utilising the kitchen food waste with low cost of production (oven) rather than pyrolysis. This is the novelty of this study. Later, the decomposition of the biochar is tested using TGA.

INNOVATION DEVELOPMENT

Preparation of raw materials

This study replicated methods listed by [12]. Orange and banana peel were collected from the local restaurants and stalls nearby Kuala Nerus, Terengganu. In the previous study, there was only one alternative biochar tested with a mix of both banana peel and orange peel. No biochar produced testing using a single material (either banana peel or orange peel alone). This study produces three biochar with 1) orange peel alone, 2) banana peel alone and 3) both orange and banana peel at specific ratio. The ratios are as shown as in Table 1.

A few other trials utilizing other kitchen food waste had been tested, however we found them as not suitable candidates for biochar. It is the coconut dregs. Coconut is one of the main food items use in common kitchen in Malaysia, mainly for the coconut cream. The coconut dregs (the leftover after straining the cream) are considered as waste. Other than that, this study also had tried using the sugar cane fibre collected from the street stall hawkers selling sugarcane juice. However, we noticed that the biochar produced did not produce flame like the successful samples did (orange peel and/or banana peel). Hence, we excluded coconut dregs and sugarcane fibres from the studies.

Table 1: Composition of substance within tested biochar [12].

Sample	Percentage of the substance (%)					
	Orange peel	Banana peel	Paddy husk	Sand	Tapioca flour	Commercial charcoal
1 (orange and banana peel)	24	24	50	0.4	1.6	-
2 (banana peel alone)	-	48	50	0.4	1.6	-
3 (orange peel only)	48	-	50	0.4	1.6	-
4 (traditional charcoal)	-	-	-	-	-	100

Banana and orange peels were cleaned under tap water before kept dried in a 140 °C oven for 24 hours [3]. The samples are mixed according to Table 1 and shaped using mould. The samples are tested for TGA first. Later, they are burnt in a 200 °C oven for 2 hours to produce the biochar. Traditional method is using pyrolysis which needs expensive equipment. Other analysis such as EDS, SEM image, are not included here as it will produce the same results as [12]. This is the continuity of the experiment from [12].

Proximate analysis by using Thermogravimetric Analysis (TGA)

Proximate analysis was carried out by a thermogravimetric analyser-before turn it into biochar [3,4]. TGA is important to study the biochar's thermal stability by measuring the weight loss of the sample over increasing heat at a constant rate. The weight loss is determined by fractions from the moisture content, into volatile matter, carbon and ash content. Around 20 mg of sample were heated at 30 °C to 100 °C to remove the moisture out of the samples. Later, the decomposition at 600 °C were carried out for 7 minutes. The heating rate is 10 °C/min from 25 °C to 700 °C under an N2 atmosphere (100 ml/min). This slow heating rate is to ensure the evenness in terms of heating distribution between particles. This is to identify the content of volatile matters such as silica etc. From 600 °C, the samples are later heated gradually until 800 °C until its weight remained. This remaining was the ash residue.

COMMERCIAL POTENTIAL

This product is suitable for domestic level in practicing zero waste lifestyle. Previously, zero waste practitioner had implemented composting to reuse the kitchen food waste or fermenting the fruits to lengthen the shelf life of the fruits. Today, everybody can convert their food waste into biochar as we propose a method of producing biochar using a domestic oven. We can reduce the reliance of landfill as this waste can be reuse. Apart from that, biomass food waste, it dumped in the landfill can release the greenhouse gases which later contributes to the global warming. If they were reused properly, we can mitigate the adverse effect from the global warming. Certain industries as well can produce money from this effort and request the public to donate the food waste for further processes. The total cost for a 27 cm^3 of ChaCO-Ban can cost about RM 1.05. With a selling price of RM1.50, we can have a 43% profit. Furthermore, our product had obtained an IP number (LY2020003882).

CONCLUSION

This study lacks many analyses for other usage of biochar. Future studies should study the physical properties of the biochar such as porosity, water retention capability, electrical conductivity, size and shape of the particles. Electrical conductivity is determined by the salt content of the biochar and to extrapolate, plants' ability to absorb water is related to the salinity. Apart from that, chemical properties such as pH value, buffer capacity. Lastly, properties related to environmental protection is also important as this will involve the permitted and prohibited heavy metal content within the biochar. It is very important as this may affect the performance in agriculture. A good biochar will encourage the earthworms to reside and the germination of the crop such as lettuce.

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REFERENCES

[1] Alherbawi, M., Parthasarathy, P., Al-Ansari, T., Mackey, H., McKay, G. (2021) Potential of drop-in biofuel production from camel manure by hydrothermal liquefaction and biocrude upgrading: a Qatar case study. Energy, 232, 1210-1227. https://doi.org/10.1016/j.energy.2021.121027.

[2] Pradhan, S., Shahbaz, M., Abdelaal, A., Al-Ansari, T., Mackey, H. R., McKay, G. (2020) Optimization of process and properties of biochar from cabbage waste by response surface methodology. Biomass Conversion Biorefinery, 12, 5479 – 5491 (2022). https://doi.org/10.1007/s13399-020-01101-5

[3] Elkhalifa, S., Parthasarathy, P., Mackey, H. R., Al-Ansari, T., Elhassan, O., Mansour, S., McKay, G. (2022) Biochar development from thermal TGA studies of individual food waste vegetables and their blended systems. Biomass Conversion and Biorefinery 2022. 1-18. https://doi.org/10.1007/s13399-022-02441-0

[4] Salgado, M. D. F., Adekunle, M. A., Mat Junoh, M., Santos., J. A. S., Ani, F., N., (2017) Preapration of activated carbon from babassu endpcarpunter microwave radiation by physical activation. 2nd International Tropical Renewable Energy Conference (i-TREC) 2017: 1-14. doi :10.1088/1755-1315/105/1/012116

[5] Akowuah, J. O., Mitchual, S. J., Kemausuor, F., (2012) Physico-chemical characteristics and market potential of sawdust charcoal briquette. *International Journal of Energy and Environmental Engineering*. 3 (1). DOI:10.1186/2251-6832-3-20

[6] Satyanarayana, B., Quispe-Zuniga, M. R., Huge, J., Sulong, I. (2021) Mangrove fueling livelihood: A socio-economic stakeholder analysis of the charcoal and pole production system in the world's longest managed mangrove forest. *Frontiers in Ecology and Evolution.* Doi:10.3389/fevo.2021.621721

[7] United Nations Environment Programme – World Conservation and Monitoring Centre [UNEP-WCMC] (2006). In the Front Line: shoreline Protection and Other Ecosystem Services from Mangroves and Coral Reefs. UNEP-WCMC Biodiversity Series 24. UK: Cambridge Printers

[8] Jamaludin, H., Elmaky, H., S., E., Sulaiman, S. (2022) The future of food waste: application of circular economy. *Energy Nexus.* 7: 1-11

[9] Veettil, B. K., Wickramasinghe, D., Amarakoon, V. (2023) Mangrove forests in Sri Lanka: An updated review on distribution, diversity, current state of research and future perspectives. Regional Studies in marine Science. 62. https://doi.org/10.1016/j.rsma.2023.102932

[10] Ilman, M., Dargusch, P., Dart, P., Onrizal, (2016) A historical analysis of the drivers of loss and degradation of Indonesia's mangroves. *Land Use Policy*. 54. https://doi.org/10.1016/j.landusepol.2016.03.010

[11] Martinez-Espinosa, C, Wolfs, P., Velde, K. V., Satyanarayana, B., Dahdouh-Guebas, F., Huge, J. (2020) Call for a collaborative management at Matang Mangrove Forest Reserve, Malaysia: An assessment from local stakeholders' view point

[12] Hasdi, I., Z., M., Dzulkifli, M., D., Mansor, M., A., D., Mohd Zakeri, M., A., K., Muhammad Dzahir, M., D., A., Ahmad, N., Mohd Ismail, N., Mohd Yusoff, M. Z., Othman, M. F., Md Yunus, M., B. (2021). Growth of eco-friendly charcoal by a low cost method. 3rd Colloqium in Science, Technology nad Innovation (KOSTI) 2021: 41-45

[13] Sanchez-Sanchez, C., Gonzalez-Gonzalez, A., Cuadros-Salcedo, F., Gomez-Serrano, V., Cuadros-Blazquez, F. (2019) Charcoal as a bacteriological adherent for biomethanation of organic wastes. *Energy.* 179: 336-342

[14] Ruby, G., E., Abdul Mutalib, N., A., Juhari, N., H., Abidin, A., F., U., Z. (2023) Food fermentation technology: examples of application in Malaysian foods. *Food and Humanity.* 1: 32-37

Pointer Calculator: Integrating Web Based in Calculating GPA and CGPA

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ABSTRACT

Grade Point Average (GPA) is the student's average grade attained in each course for a specified semester, and Cumulative Grade Point Average (CGPA) is the average result from all the semesters taken. Both GPA and CGPA are indicators of students' academic achievement. Though grading systems vary depending on countries or schools, GPA and CGPA are widely adopted systems for assessing students' academic achievement at various levels of education in higher education institutions. Although the system is widely used, SPM leavers find it hard to understand the calculation leading to the GPA and CGPA values obtained. Therefore, this study took the initiative to provide exposure to the students with the development of GPA and CGPA calculators. Using this pre-built calculator, students only need to enter the grade for each subject they are taking. The advantage of this calculator is that students can see the working route for the GPA and CGPA computations, which they can also print. Academic mentors are permitted to receive data for monitoring reasons from the department. Students only need to download and utilize the applications for free.

Keywords: GPA; CGPA; calculator; academic performance; pointer

INTRODUCTION

There are a variety of undergraduate study options offered for SPM leavers in higher education institutions, such as foundation studies, STPM, and diplomas, which they can then pursue into degrees and master's degrees. The most common grading systems used in colleges and universities are grade point average (GPA) and cumulative grade point average (CGPA). The CGPA scale is diverse in terms of marks distribution, with some universities following USA standards but not similar. Researchers have discussed the application of the scale of CGPA, which is set by the government and the Ministry of Education. This benchmark is mandatory for educational institutions, educational boards, and universities, as it is set by the government and the Ministry of Education [1]. A tool is needed to monitor a student's courses and project scenarios that will allow them to clear a particular academic level or clear academic probation. This tool will greatly ease up the adviser's job and minimize, if not eliminate, advising errors. It will also be of great help to any academic institution implementing the GPA system [2].

Locally practiced, GPA and CGPA is a numeric depictions of students' academic performance in the tertiary education system. GPA calculates the average grade for a specific semester, while CGPA calculates the overall average of students' academic performance for all semesters until graduation. Ranging from a scale of 1.0 to 4.0, both GPA and CGPA track the

student's progress during their studies and are often used as an indicator in producing competent graduates. Each university subject is assessed on a 100 (or 4) point scale in the exam, with 100 (or 4) being the highest and 0 being the lowest possible score. Since the aggregate would thus range from 75 to 100 (3 to 4), it should be noted that the higher the academic achievement, the lower the aggregate [3]. According to Adibah et al., there are a few factors that affect the CGPA results such as the teaching and learning process, self-motivation, and attitude of students toward the course [4].

In general, calculating the overall average of students' academic performance is vital in encouraging self-development during the tenure years in college or university. It was found that academic achievement has a significant impact on a student's motivation, persistence, and sense of self-worth in higher education [5]. By setting a goal, students can monitor their progress as well as plan future required improvements, which helps them to visualize their learning path and build a focused mindset for their studies.

However, when SPM leavers further study with foundation, STPM, or diploma programs, they have no knowledge of how GPA nor CGPA are calculated, making it difficult for them to set a goal to achieve good exam results. Most of the time, briefing and explanation were provided by institutions via traditional PowerPoint or spreadsheet, which proved ineffective as most students still struggled to understand the computations, or they simply forget how the calculation works after the briefing is over. Other than that, students also tend to misplace or lost the document provided after some time.

As a result, this study took the initiative to provide students with exposure through the development of GPA and CGPA calculators. When utilizing this pre-built calculator, students simply enter their grades for each subject they are studying for that semester. With a single click, the results will be displayed immediately. These eliminate the issue arising from lost documents provided by the institutions on how to calculate GPA or CGPA.

Even after entering tertiary education, students still need supervision and counsel from someone skilled and experienced in their field of study [6]. Academic advising applies knowledge of the field to empower students and campus and community members to successfully navigate academic interactions related to higher education [7]. Hence, most institutions developed a student-advisor relationship, called as academic advisors or mentors, with a distinct role to aid students in achieving educational, career, and personal goals. With access to data from this built-in calculator, academic mentors will have a piece of mind to generate ideas on how to help their mentees based on their strong and weak subjects to achieve their targeted goals.

INNOVATION DEVELOPMENT

The developer of this invention requires knowledge of computer programming namely Construct 3. Construct 3 is an HTML5 game engine based on a 2D and 3D game engine created by Scirra Ltd. Using Construct 3, this research creates a pointer calculator.

The main setup of the web page consists of three tabs; structure, calculator and result, as shown in Figure 1.



Figure 1: Main page of the app

By clicking *struktur* tab, a set list of each subject offered with its credit hour for each semester can be viewed (Figure 2). Each page showed subjects from a different category of STEM courses offered. Students can return to the main page simply by clicking the back arrow button on the top left of the page. On this page, students are able to track each subject they have taken or need to be taken in the semesters to come.

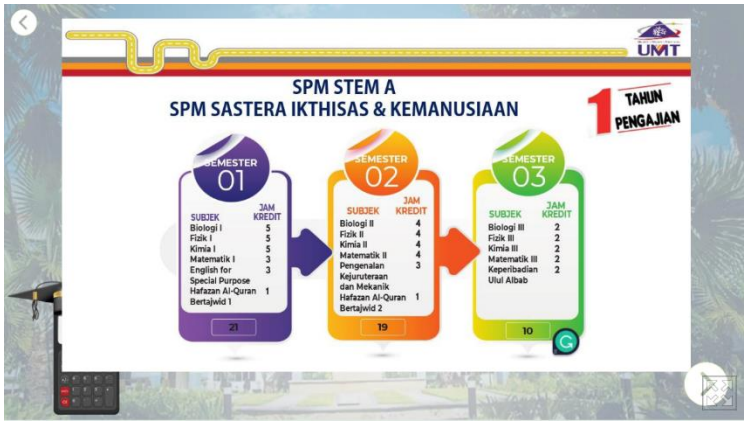


Figure 2: Subject offered in one of the category

In the *kalkulator* tab, several simple pieces of information need to be filled in by students (Figure 3) such as Matrix Number, the semester they are in, and their program category, in which once students filled in the required information, the subjects offered and its credit hour are automatically listed, ready for the students to fill in their grade for each subject. The GPA will then be automatically calculated each time the grade for each subject has been chosen from the drop-down button (Figure 4).



Figure 3: Front page in *kalkulator* tab



Figure 4: The generated GPA

As the result for each semester is filled, students can view the CGPA achieved in the *keputusan* tab as shown in Figure 5. Students would have the option to print their results as a reference simply by clicking the print icon on the bottom right.



Figure 5: Front page of *keputusan* tab

Most higher education institutions now adopt the concept of the lecturer as an academic mentor, in which each lecturer is entrusted to help their mentee with academic and as well as non-academic related issues. The novelty of this project is by using this pointer calculator, the mentor will be able to quickly gain access to their mentees' GPA and CGPA (Figure 6), including the subjects taken or to be taken by the mentee throughout the program.

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Nama**	**Sem**	**CGPA**	**Kategori (A,BB,BF,BK)**	**Semester 1**							**Semester 2**
2				A=Biasa , BB=TanpaBio , BF=TanpaFizik , BK=TanpaKimia	Biologi I	Fizik I	Kimia I	Matematik I	English for Special Purposes	Hafazan Al-Quran Bertajwid I	Science in Life I	Biologi II
3	A0167	1	3.95	A	A	A	A	A-	A	A-		
4	A0167	1	3.95	A	A	A	A	A-	A	A-		
5	A0167	2	3.14	A								A
6	A0167	1	3.56	A	A	B	A-	B-	A	C-		
7	A0167	3	3.85	A								
8	A0167	2	3.9	A								A
9	A0167	1	3.89	A	A-	A	A-	A	A	A		
10	A0167	1	3.95	BB		A	A	A-	A	A-	A	
11	A0167	3	3.85	BK								
12	A0167	1	3.88	BB		A	A-	A-	A-	A	A	
13	A0167	2	3.33	BB								
14		1	0	A								
15	A1088	1	3.68	A	B	A	A-	A-	B	B		
16	A2430	2	4	BK								A
17	A1704	2	3.75	A								A

Figure 6: Mentor's viewing page

These data will be a big help to the mentor to quickly monitor, advise and suggest ways to help their mentee which may include managing time appropriately, study plan, or appropriate study skills. Other than that, the data gained can also help the mentor to detect any issues that might arise for each mentee related to their major or program, especially for any subject that requires pre-requisite.

COMMERCIAL POTENTIAL

Previously, students were provided documents in Word, spreadsheet, or PowerPoint format to fill out their target GPA and CGPA. They learn to calculate their pointer with this form as well. Because of this strategy, students have a major risk that the document will be misplaced or lost. Nowadays, all students are in flow with the trends in technological innovation due to their fast interactivity with electronic devices. The internet has dramatically revolutionized and expanded the feasibility of various web or mobile applications.

We integrated paper into web page with the aim of using technology so that students at any level of education and at any time can use a pointer calculator to compute their GPA and CGPA for free. Regardless of any institution, program, or education level pointer calculator can be used to setup their program structure with the details of credit hours in the setting button provided as shown in Figure 1.

The usage of the pointer calculator may benefit the market potential of both end-users, educators, and students as it could save time and cost, be well organised, and be environmentally safe. In addition, the data history of grade calculation can be retrieved as it is kept in the system. Hence, the student's academic performance can be periodically monitored by the advisors throughout the semesters. At the same time, the data of the CGPA calculation can be displayed to the student so that they can acknowledge their strengths and weaknesses for better grade improvement.

A survey has been conducted to assess the user's experience with this pointer calculator, as shown in Figure 7. The majority (>50%) of users agree and strongly agree that the pointer calculator is extremely easy to use, that it assists them in determining their target, that they learn how to compute the pointer, that they are interested in using it to set up their goal, and that they are satisfied whenever they use it.

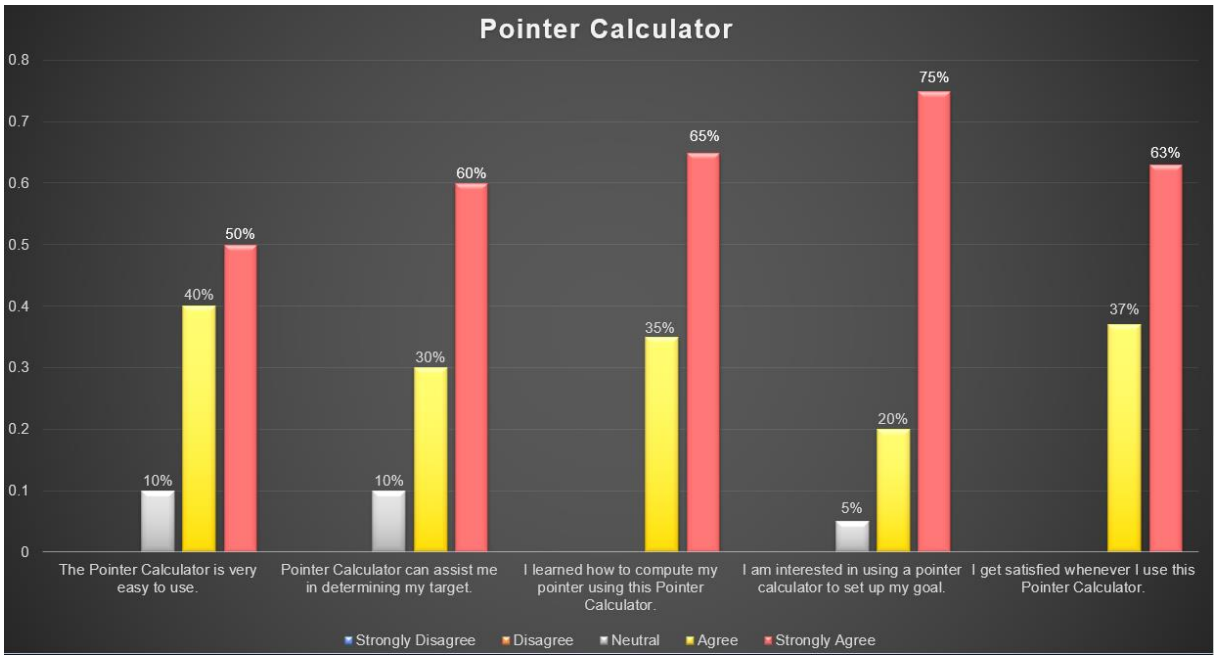


Figure 7: A survey of users' experiences with the pointer calculator

The copyright of this invention has been applied in May 2023 via the Intellectual Property Corporation of Malaysia (MyIPO) as shown in Figure 8.

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Rujukan Kami : UMT/ICC/2 – 2/36/2(4)
Tarikh : 7 Mac 2023
Bersamaan : 16 Syawal 1444

Nurul Syahida Abu Bakar
Pusat Asasi STEM,Universiti Malaysia Terengganu

YBrs. Prof./Prof.Madya Dr./Dr./Tuan/Puan,

MAKLUMAN STATUS PENDAFTARAN HARTA INTELEK BAGI BILANGAN 2/2023

Dengan segala hormatnya perkara di atas dirujuk.

2. Sukacita dimaklumkan bahawa status permohonan pendaftaran harta intelek telah **diterima** dan dalam proses kelulusan serta pendaftaran dari pihak Pusat Inovasi dan Pengkomersialan (ICC).

3. Maklumat lanjut permohonan yang diterima adalah seperti berikut :

Tajuk Permohonan	:	Pointer Calculator : Integrating App in Calculating GPA and CGPA
Inventor	:	1. Nurul Syahida Abu Bakar (Ketua)
Jenis Harta Intelek	:	Hak Milik/*Copyright*

4. Untuk Makluman, proses pendaftaran dan status terkini akan dimaklumkan dalam masa terdekat. Semoga perkara ini berada dalam makluman dan perhatian YBrs. Prof./Prof.Madya Dr./Dr./Tuan/Puan.

Figure 8: Application of copyright

EQUATION

The following expression has been used to calculate GPA and CGPA in the pointer calculator.

$$\text{Semester GPA} = \frac{\sum(\text{Course credits} \times \text{Grade points obtained}) \text{ of a Semester}}{\sum(\text{Course credits}) \text{ of respective Semester}}$$

$$\text{Semester CGPA} = \frac{\sum(\text{Total credits of a Semester} \times \text{GPA of respective Semester}) \text{ of all Semesters}}{\sum(\text{Total course credits}) \text{ of all Semesters}}$$

CONCLUSION

The goal of the pointer calculator is to guide SPM leavers on how to compute and set their target GPA and CGPA. Users just enter their grades for each subject they are taking when utilizing this technology. The calculator will assist students in quickly calculating their GPA and CGPA. The computation is clearly displayed in the print function so that the user understands how the GPA and CGPA are obtained. Nonetheless, academic mentors are permitted to receive data from the pointer calculator that students update. The purpose is for the mentor to keep track of their mentee's performance as well as their GPA and CGPA target. Since the pointer calculator is user-friendly, it can be used by any institution, education level, or program at any time. It would be a tremendous success if the calculator could be widely linked to different universities' LMS at any time.

ACKNOWLEDGEMENT

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REFERENCES

[1] Kausar, M., Anis, M., Sultana, I. (2022). Variations and Barriers of GPA and CGPA in the Education System of Bangladesh. ICRRD Qual. Ind. Res. J. 2021, 3(1), 122-130.
[2] Ugalde, B., Salburo, A., Ambula, Y., Del, J. (2017). Marks Management System an Interactive Web-Based Approach for Academic Advising. International Journal of Web Technology Volume: 06, Issue: 01, June 2017, Page No.24-28.
[3] Naderi, H., Abdullah, R., Aizan, H. T., Sharir, J., & Kumar, V. (2009). Creativity, age and gender as predictors of academic achievement among undergraduate students. *Journal of American Science*, *5*(5), 101-112.
[4] Hasan, N. A. A., Ahmad, N., & Razak, N. A. A. (2017). Factors that significantly affect college students' CGPA. *International Academic Research Journal of Social Science*, *3*(1), 77-81.
[5] Jayanthi, S. V., Balakrishnan, S., Ching, A. L. S., Latiff, N. A. A., & Nasirudeen, A. M. A. (2014). Factors contributing to academic performance of students in a tertiary institution in Singapore. *American Journal of Educational Research*, *2*(9), 752-758.
[6] Omar, J. B. Case Studies of Using a Template File for GPA Calculator in Academic Advising Activities at Universiti Tenaga Nasional. In *Proceedings [on CD} 2nd Regional Conference on Engineering Education (RCEE Johor 2007)* (pp. 37-45).

[7] Larson, J., Johnson, A., Aiken-Wisniewski, S. A., & Barkemeyer, J. (2018). What is academic advising? An application of analytic induction. *NACADA Journal*, *38*(2), 81-93.
[8] Gans, J. S. (2012). Mobile application pricing. *Information Economics and Policy*, *24*(1), 52-59.

The Application of Jack D' Pack Energy Kit in Bio-Battery

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ABSTRACT

The main objective of this project is to produce an environmentally friendly bio-battery product or kit from two types of fruit waste, namely jackfruit (*Artocarpus heterophylus*) and durian (*Durio zibethhinus*), and also to explain the bio-battery application of the Jack D' Pack Energy Kit. The arrival of this season is eagerly awaited by Malaysians to taste the delicious pulp of jackfruits and durian. However, only the juicy pulp of jackfruits and durians is consumed and the peel (the green peel) is thrown away. To solve this problem, an electrochemical concept was introduced to prevent this issue. Electrochemistry is a relationship between electricity and chemical changes. It results from the outcome of the chemical reaction. In this project, we developed an alternative to use jackfruit and durian fruit waste by generating energy for electricity. Durian and jackfruit waste have the potential to generate energy because the peel structure of durian and jackfruit is similar. Both types of fruit have one thing in common: an pungent aroma strong smell. This kind of indicator will show great potential in producing bio-battery and producing it as a product or kit for marketing.

Keywords: Bio-battery; electrochemical; renewable energy; fruit waste

INTRODUCTION

The Jack D' Pack is a combination of two types of fruits. They are the jackfruit (*Artocarpus heterophylus*) and the durian (*Durio zibethhinus*). Jackfruit is the largest edible fruit in the world [1]. Jackfruit is a multiple fruits consisting of edible (pulp and seed) and non-edible (peel and rachis) parts. The tender green fruit is used as a vegetable and the juicy pulp of the ripe fruit is eaten fresh as a dessert [2]. Durian is known as the king of fruits. It has a prickly texture (thorny skin), and the inside is yellow, soft, and has a very pungent aroma. However, despite the deliciousness of the durian fruit, the durian fruit also has another advantage, which is that the skin of the durian fruit can produce energy. Fruits and vegetables can be used as alternative renewable energy sources in the form of bio-batteries as a substitute for conventional batteries because they have electrical properties that contain a lot of electrolytes [8].

Every year the jackfruit and durian seasons occur from July to December. There is a lot of jackfruit and durian waste in the garbage. Converting food waste into value-added products will not only improve the overall economy but also reduce environmental pollution [3]. For this reason, the main objective of this project is to produce a fruit waste battery eco-friendly product or kit. Secondly, to provide an explanation of the application of the product Jack D' Pack Energy Kit in Bio-Battery. To solve the problem, a few concepts were introduced to prevent this matter. One of the concepts is electrochemical. Electrochemistry is a relationship between electricity and chemical changes. It's come from the result of the chemical reaction. An electrochemical reaction also can be produced through a chemical reaction that occurs as an

electric current such as electrolysis. So, in this project, we devise a way to use jackfruit and durian fruit waste to create energy for electricity. The durian and jackfruit waste has the potential to generate energy storage because of the peel structure of durian and jackfruit. Both types of fruit have a similarity that is an unspeakably strong smell. This kind of indicator will show a big potential in producing bio-battery.

A bio-battery is a technology that produces electrical energy using components sourced from living beings [7]. It is a device that generates electricity from organic compounds. Bio-batteries have three major parts, an anode, a cathode, and an electrolyte. Here, the electrolytes were used for bio-fuel cells instead of chemical fuel cells. The glucose biofuel cell has become one of the most important potential energy sources. One of the substances that has the most potential for usage in bio-batteries is fruit [7,1].Fruits and plants that contain sugar were recommended due to the fact that they have sufficient chemical energy that can be converted into electrical energy. [4]

INNOVATION DEVELOPMENT

The Jack D'Pack is a battery that can produce an electric current. It allowed students or others to learn the concept of electrochemistry by building an electric circuit using the powder (containing fruit waste) without using dangerous chemicals because the Jack D'Pack comes from organic compounds. The waste fruit cores of durian (*Durio zibethinus*) and jackfruit (*Artocarpus heterophyllus*) were selected as candidates based on their structures and their prospect of intrinsic nitrogen doping [3,2].

Materials used in this project included jackfruit and durian waste, sterile water, copper electrodes, magnesium electrodes, copper electrical wire, alligator clips, and beakers. Equipment used in this project included an electronic blender (GMC Dry & Wet Mill BL -001), an electronic scale, a digital ammeter, and a decade resistor.

All of the following problem solving procedures are illustrated in the following figure 1.

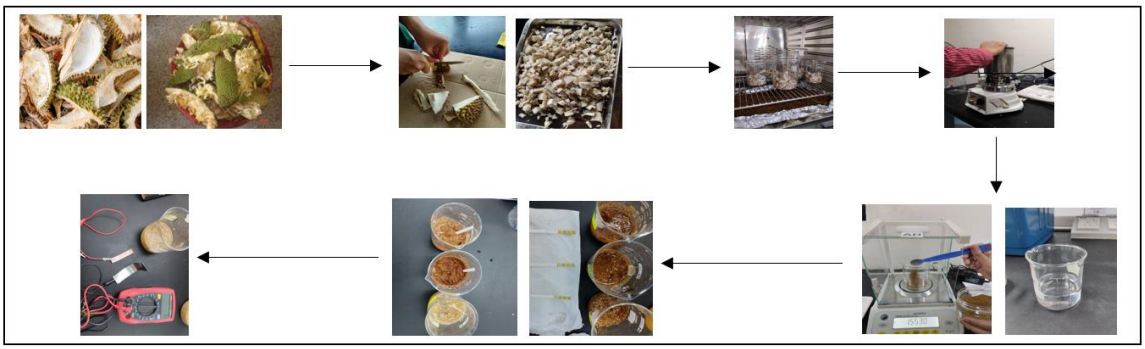


Figure 1: The procedure show the existence of energy.

Figure 1 above shows the procedure used to test the presence of energy in jackfruit and durian waste from jackfruit and durian waste. We conducted the project in 6 steps. First, we collected the fruit waste of jackfruit and durian, then we cut the jackfruit and durian peel into small pieces and put them in the oven for one day at the temperature. Weigh 10 g of jackfruit and durian powder, add 100 ml of water and stir, wait for 15 minutes, then put in the pH paper and note the pH value. Clamp the magnesium metal to the negative terminal and the copper to the positive terminal, and dip into the beaker every 5 minutes for 1 hour and record the reading.

Since, the procedure above success show the existence of energy. To strengthen this statement according to other researchers, the outstanding electrochemical performance of durian and jackfruit waste electrodes is attributed to the large surface areas and desirable mesoporous structures as they facilitate improve diffusion of ions through the electrode, also enhances electronic conductivity [3,3].

To improve this project to the next level, we applied the powder (extract from durian and jackfruit) will packaging in one pack as a product. This product namely as Jack D' Pack. In that pack it contains jackfruit and durian powder, wire clamp, 2 iron plates (copper), 2 iron plates (magnesium) and sandpaper together with the instructions.



Figure 2: Innovation Product - Jack D' Pack

COMMERCIAL POTENTIAL

This product is one of the application of Jack D' Pack. It can be used as a teaching tool especially for parents. It can be done at home together with the children. At the same time, it can arouse children's interest especially in the field of science at an early age. Science is very interesting subject. Science subjects should also arouse curiosity in children to ask questions and explore [5]. All these elements are naturally present in children [5]. It is also able to introduce children to electrochemistry and much more.

Attach here Intellectual Property Recognition (IPR) by our intuition about this project.

CONCLUSION

All the objectives of this project were successfully achieved. The use of fruit waste from jackfruit and durian waste has been fully exploited, and the successful environmentally friendly products or kits from fruit waste batteries have been successfully produced. The product can be used as a teaching tool for children to introduce them to bio-battery. In the future, this product can be commercialised with more design and technology aspects to make it accessible to children in school. To improve the product, perhaps we can use different kinds of fruits that have a pungent smell.

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REFERENCES

[1] Naik, K. C.,1949. South Indian Fruits and Their Culture. P. Varadachery & Co, Madras, pp. 300-302.
[2] Chayon, G., & Rakhi, C. (2016). Nutritional Composition of Fruit Cultivars: Jackfruit (*Artocarpus heterophylus*), 317-318. https://dx.doi.org/10.1016/B978-0-12-408117-8.000014-3.
[3] Keeny. L., Luba, S., Shaikh, N. F., Van, C. H., & Vincent. G. G. (2019). Aerogel from Biowaste Produces Ultracapacitor with High Energy Density and Stability. https://doi.org/10.1016/j.est.2019.101152
[4] E Haryati, K Dahlan. (2019). 7th Asian Physics Symposium. Characterization of Bio-battery from Tropical Almond Paste, 3-36. https://iopscience.iop.org/article/10.1088/1742- 6596/1204/1/012036
[5] Hasbullah. S. S., Abu. B. K., & Othman. N. (2020). Early Science Learning and Preschool Children's Sosial and Emotional Competencies. 55-70. https://doi.org/10.17576/akad-2020-90IK3-05
[6] Jirout, J. & Zimmerman, C. 2015. Development of Science process skills in the early childhood years. In Research in Early Chilhood Science Education , edited by K. C. Trundle and M. Sackes, 143-165.
[7] Fauzia. S., Ashiddidi. M. A. H.,& Khotimah. A. W. K.(2019) .Fruit and Vegetable as a Potential Source of Alternative Energy. http://www.researchgates.net/publication/337021497.pp 161-167.
[8] Jauharah, Wira Dian. 2013. Analysis of Electricity Produced by Fruit Waste and Vegetables as Alternative Energy Bio-Batteries. (Thesis). University of Jember. East Java (In Indonesian).

mBot Robot kit Module: Scratch Coding for Special Needs Student

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ABSTRACT

As the usage of high levels of technology usage in our daily life is becoming more common and keeps on advancing every day, it is important for the teaching and learning process to cater for special needs students to be included in this advancement. A teaching module for robotics is a structured program designed for special needs students on how to assemble basic robot, the concept of sensor function and their applications and program robots using scratch programming. The focus of this module is to approach the special needs student by focusing more on the visual observation for learning the programming. In conclusion, this module for robotics is a good introduction to the fascinating world of robotics and prepares the student for the advancement of technology in daily life.

Keywords: Teaching and learning1; module 2; robotic 3; scratch programming 4

INTRODUCTION

The usage of technology in our life has becoming more advance and has help to improve productivity in terms of saving time and resources as well as giving better outcome for daily activities [1]. As example, a smartphone can have all the functions that are necessary for human identification, banking, travel, communication, entertainment even for doing work. The mass digitalisation of information from physical paper to digital data that can be stored online has made all this possible.

Therefore, there is a need for everyone to adapt, apply and use the new technology so that no one will be left behind. That is why, the teaching and learning for technology is encourage at the early stage to trigger the interest and make children be able to adapt with the incoming new technology advancement [2,3,4].

However, for the special needs students (SNS) with hearing disability, proper and special guidelines are needed because they cannot hear to listen focus and listen for instruction. SNS have the capability to focus more on kinaesthetic learning approach as they use visual to interact with their surrounding during learning session [4,5].

This module has been developed specifically for SNS at primary level school to develop their interest in robotic, coding and technology related activities [6]. There has been some research done on how robot can be used to help students with physical disability to perform better at tasks and help them in social skills [7,8]. Most of SNS has been exposed to smartphone in their daily life which make it easier for the learning process. However, teacher with capability to use sign language is still needed for interpreting instruction form instructor especially at the early stage of the session.

INNOVATION DEVELOPMENT

mBot is a robotic kit that consist of a basic robot set that comes with two sensors. The first sensor is proximate sensor which works by transmitting and receiving infrared light. This sensor can detect any obstacle that blocking the pathway. The second sensor is line sensor that emits infrared light and measure how much infrared will be reflected that can be used to detect line for a pathway.

MBot is an educational robot that makes learning and teaching robot programming simpler and fun. SNS may start the leaning process with just a screwdriver and robot assembly manual. There are 3 main sections in this module.

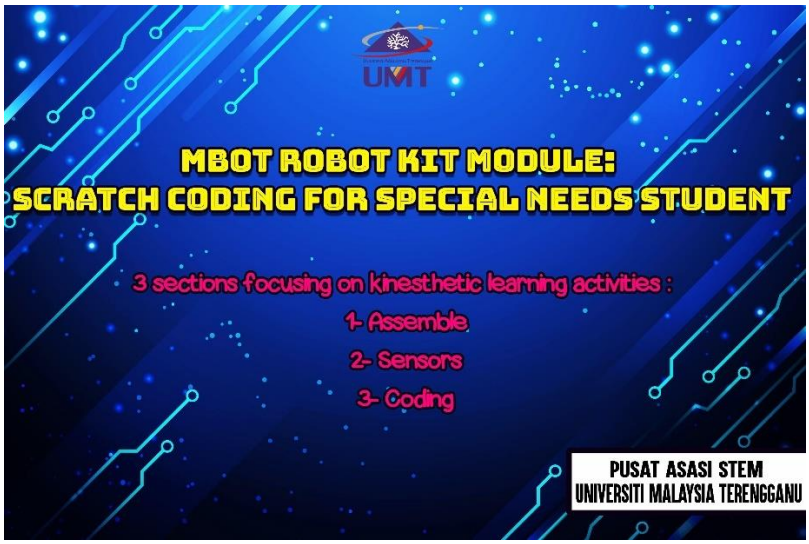


Diagram 1: Poster for the mBot Robot Kit Module

Section 1 (Assemble the robot activity)

The instructions for assembling the robot are given in step-by-step instructions with diagram for each step. SNS can explore this process on their own with minimum help from instructor. They can play around the screws, as example the correct size and the effect for the movement or mechanics of robot if wrong screw is chosen to attach different parts of mBot together.



Picture 1 and 2: SNS were guided by instructor and the teacher helped for translation

Section 2 (Understand the sensors)

After assembling the robot, in this module SNS will be instructed to follow activities to understand how the proximate sensor and line sensor work.

Proximate sensor activity: Turn on the mBot with obstacle avoidance mode and use to wave and block the pathway of mBot as the robot will move in forward direction. Instructor can modify the activity by asking SNS to design their own obstacle and see the movement of the robot.

Line sensor activity: SNS will be instructed to draw a line using different colour marker of a paper mahjong paper. The line drawn must be thicker for about at least 3 cm otherwise the sensor would not be able to detect the reflected light. Then, turn on mBot with line follow mode and put it at the beginning of the line drawn to see whether the mBot able to follow the line drawn. The instructor must show the example for the thickness of line that is required and the pattern for the line should have some gap around 6 cm between adjacent line. Otherwise the line sensor may not be able to move accordingly.

Section 3 (Scratch Coding)

The instructor explain about how the 2 sensors from the previous section can be used for coding to give command for mBot to follow. In this activity, instructor and SNS will need to have a phone or a tablet for coding. There are 2 apps available for both android and ios, which are mBlock – Learn Coding and mBlock Blocky – STEM education. Both are using Scratch coding programming which the command can be aligned independently to get the desired outcome.

These 2 apps are come with built in introduction tasks for SNS to complete. During this session, instructor must observe and give help as some SNS may need some explanation during the session.

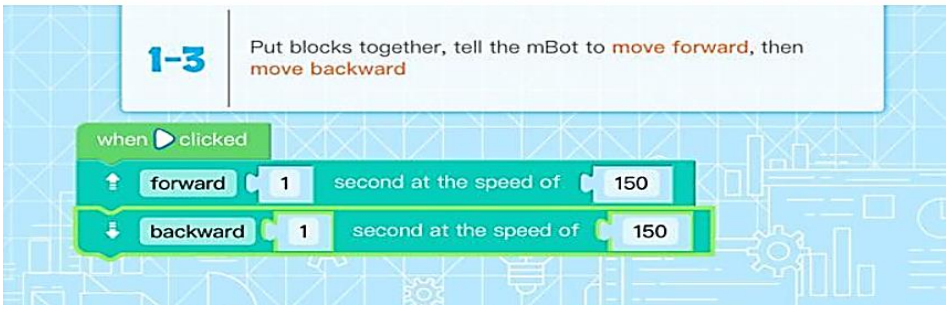


Diagram 2: Example of coding line from mBlocky app

What makes this app easy to use is SNS just need to choose any desired command and arrange the command accordingly based on the instructions given for the tasks. The instructor may need teacher that can use sign language for explanation and interpretation for using the command correctly.

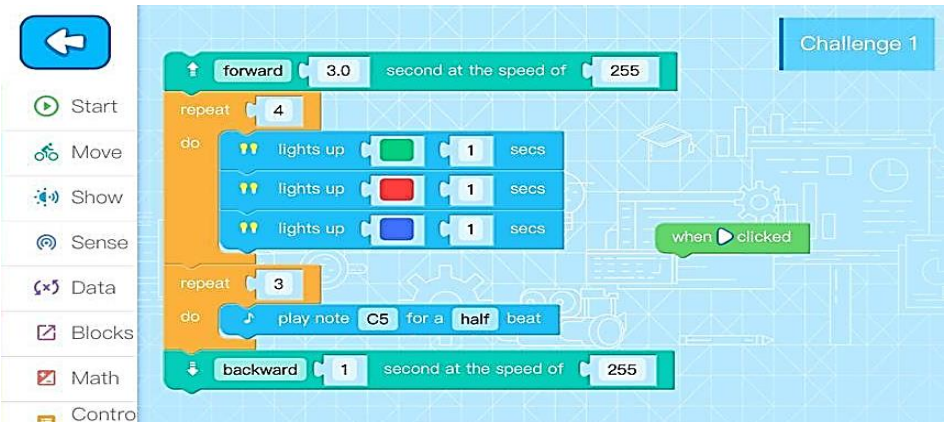


Diagram 3: Lists of commands that can be compiled together to complete given task

As SNS get better understanding on how each command works and how to use it properly, the instructor may proceed by giving task that required SNS using multiple command to solve it. As example, by arranging 3 obstacles at different place, instructor will show what is the required outcome. SNS may use their own creativity doing scratch coding.

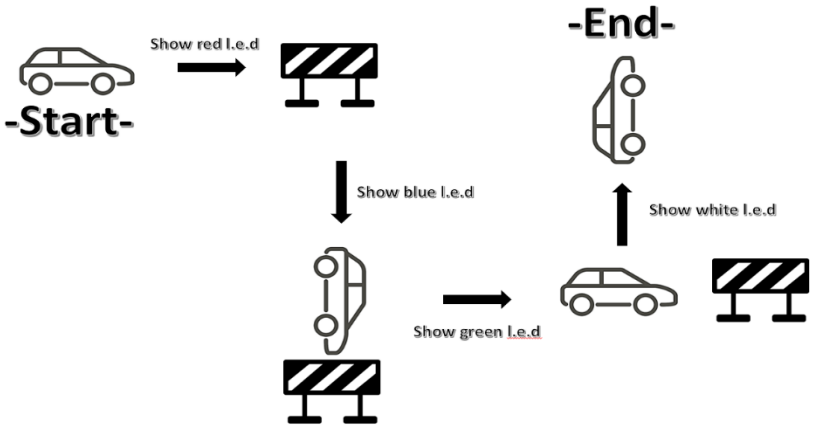


Diagram 4: Example of task for SNS to complete by Scratch coding

COMMERCIAL POTENTIAL

Introduction to technology related activities are important to SNS but not much have been introduced in class due to several limitation. This module can be used to enhance more participation from school to help SNS in the learning process.

CONCLUSION

Based on the sessions with SNS, the teachers have been interviewed to get the feedback on how these modules affecting SNS learning progress. Teachers mostly are overwhelmed with the robotic module because SNS has shown huge interest during and after the sessions. SNS showed increase participation and solving skills during the process. Thes session encourage teamwork and discussion among team member in order to solve the given task. The only problem with this robotic programme module is the cost for each mBot kit and a tablet are expensive for the school to acquire. Hopefully, the price for the mbot kit and tablet will be reduced in the future.

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Special thanks to Human Capital Development Unit, Education Planning and Research Division, Education, Ministry of Education for providing the budgets for mBot robotic kits and tablets. SNS and teachers from SK Pendidikan Khas Besut (P), SK Pendidikan Khas Kuala Terengganu (P) and SK Padang Hiliran for continuos support during the development of this module.

REFERENCES

[1] Yaoxi Shi, Peter Koval, Vassilis Kostakos, Jorge Goncalves, Greg Wadley, "Instant Happiness": Smartphones as tools for everyday emotion regulation, *International Journal of Human-Computer Studies*, Volume 170, 2023, 102958, ISSN 1071-5819, https://doi.org/10.1016/j.ijhcs.2022.102958

[2] Chalmers C., Robotics and computational thinking in primary school, *International Journal of Child-Computer Interaction*, Volume 17,2018, 93-100, ISSN 2212-8689, https://doi.org/10.1016/j.ijcci.2018.06.005

[3] Bakala, E., Gerosa, A., Hourcade, J. P., & Tejera, G. (2021). Preschool children, robots, and computational thinking: A systematic review. *International Journal of Child-Computer Interaction*, 29 https://doi:10.1016/j.ijcci.2021.100337

[4] Katerina T, Korbinian M., Marcos R., Jessika G., Luzia L., Martin V., Manuel N., A cognitive definition of computational thinking in primary education, *Computers & Education*, Volume 179,2022,104425, ISSN 0360-1315, https://doi.org/10.1016/j.compedu.2021.104425

[5] Campos, V. M., & Muñoz, F. J. R. (2023). Design and piloting of a proposal for Intervention with educational robotics for the development of lexical relationships in early childhood education. *Smart Learning Environments*, 10(1) https://doi:10.1186/s40561-023-00226-0

[6] Papadakis, S. (2020). Robots and robotics kits for early childhood and first school age. *International Journal of Interactive Mobile Technologies, 14*(18), 34-56. https://doi:10.3991/ijim.v14i18.16631

[7] University of Manchester. (2015, May 12). Training teachers for deaf children gets a robotic helping hand. *ScienceDaily*. Retrieved May 11, 2023, www.sciencedaily.com/releases/2015/05/150512112253.htm

[8] https://www.nytimes.com/2022/03/29/technology/ai-robots-students-disabilities.htm

Rabbitry System: Smart Rabbit Breeding Monitoring System

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ABSTRACT

Previously in rabbit farming activities, data for a species type, weight, amount and type of nutritional diet, number of doses of vaccine taken, duration the frequency with which the parent rabbits were bred as well as the expected period the rabbits matured and ready for sale as broiler rabbits was taken and manage manually and needs to be recorded in detail for each rabbit individually. Usually, these data were recorded by using a logbook and the probability of getting some errors while recording the data is very high because of the large number of rabbits need to be monitored as well as the factor of loss or damage of the logbook itself. Therefore, this mobile application called Rabbitry System was developed as a smart farming management system that can be operated via smart phone or tablet. As a cloud-based computer system, all personal data relating to rabbits and/or farming operations may be saved, monitored, managed, and facilitated more systematically and efficiently in a single database platform. This information was transformed into QR codes, which may be accessed from anywhere. Furthermore, this invention may boost the effectiveness of livestock output while also increasing our local farmer revenue to an optimal level.

Keywords: Rabbit; farming; logbook; mobile application; QR code

INTRODUCTION

Rabbit farming is a field that has a lot of good business potential if it is developed properly [1-4]. The main potential of the rabbit industry is to create an agro bine, as indicated by its ability to multiply whether cultivated on a small scale or commercially; and it is expected to compete with other animal husbandries such as broiler chickens, goats, and other farm animals that readily available in the local market [5]. However, the productivity of rabbit farming is still at a low level due to most of the breeders still carrying out some monitoring activities and their rabbit breeding management manually.

Currently, all data for a species type, weight, amount and type of nutritional diet, number of doses of vaccine taken, duration the frequency with which the parent rabbits were bred as well as the expected period the rabbits matured and ready for sale as broiler rabbits was taken and manage manually and needs to be recorded in detail for each rabbit individually. In addition, usually these rabbits are raised in 30 to 50 small cages where for each cage can only accommodate 2 to 3 rabbits [6,7].

Furthermore, these data are often recorded in a logbook, and the probability of making a mistake while recording data is considerable because of the huge number of rabbits need to monitor as well as the possibility of loss or damage to the logbook due to effect of bad weather,

missing the logbook or any consequences.

Therefore, there are three main objectives need to fulfil for solving all the problems mentioned before. Firstly, to create low-cost mobile applications that may be controlled through smartphone or tablet for monitoring work and rabbit breeding management. Secondly, to record and gather all rabbit-related data in a more systematic and efficient manner on a single platform or database. Finally, to increase the effectiveness of livestock productivity while also increasing farmer revenue to the maximum.

Completely, a new systematic and effective method of monitoring and management was developed to simplify the activities of farming by using mobile applications integrated with cloud computing called as Rabbitry System. With this system, all personal data relating to rabbits can be recorded and saved in one database platform on the internet in a more organised, systematic, and secure manner using this mobile application. Next, this is the simple flow of how the system works. Firstly, the farmers will open this Rabbitry System mobile apps via their smartphone or tablet. Next, the farmers will scan the QR code label for each cage using Rabbitry System mobile apps, one QR code will represents 1 or 3 rabbits from the same species, birthday, and parents. This QR code scanning will bring the farmers to the main database system. Then all data from their rabbits will be key in using this mobile apps. Lastly, once all the data was successfully key in and save, there were stored in main data base as a cloud computing system and all information stored can be access from everywhere. Besides, this data base also has its own simple security system for safety and monitoring purposed.

In addition, several outputs and impacts were projected as a result of this invention, which prompted us to create this system. Primarily, it can maximize farm production by integrating traditional livestock practises (manual) with cutting-edge technological applications. Secondly, it also can contribute to accommodating and balancing demand for meat-based product supply now; previously, the user was only reliant on the product meat-based poultry and cows. Finally, it can open interest and create opportunities new jobs in the agricultural business to the younger generation (graduates) especially involving Internet of Thing (IOT) for smart farming[8,9].

INNOVATION DEVELOPMENT

This Rabbitry System mobile application was created by first creating a simple database foundation in Microsoft Excel. This Microsoft Excel spreadsheet was created based on the sorts of data that must be collected from the rabbit, such as species type, weight, amount and type of nutritious diet, number of vaccination doses administered, and so on. This Microsoft Excel spreadsheet will then be uploaded to the Open as Apps Website, a free online platform where it may be converted into a mobile application. The next procedures are to convert the Microsoft Excel spreadsheet into a QR code, print, laminate, and label the rabbit cage. Scan the QR code with a smartphone or tablet to access the Microsoft Excel spreadsheet, which is already stored in the website's cloud storage. As a result, all data changes made using this mobile application will be immediately stored in a Microsoft Excel file. Because it is low-cost and simple to run, this innovation may have a significant influence on the expansion of our agricultural industry.

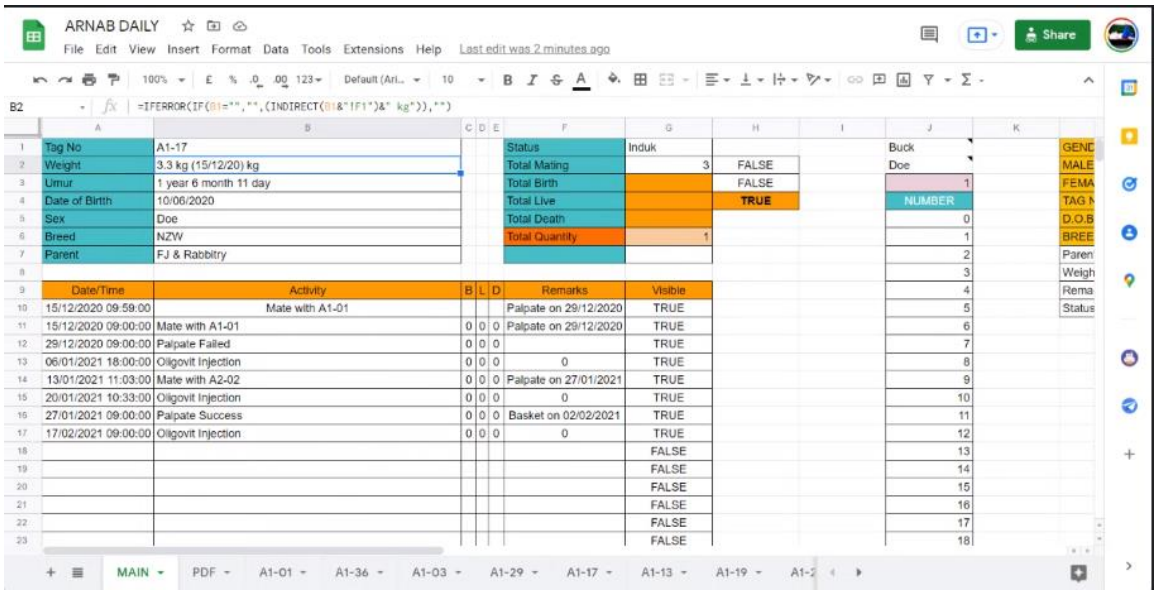


Figure 1: A basic database framework by using Microsoft Excel spreadsheet.

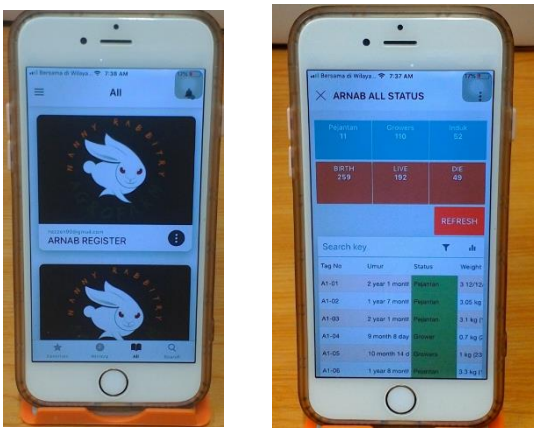


Figure 2: View of Rabbitry System mobile application via smartphone.

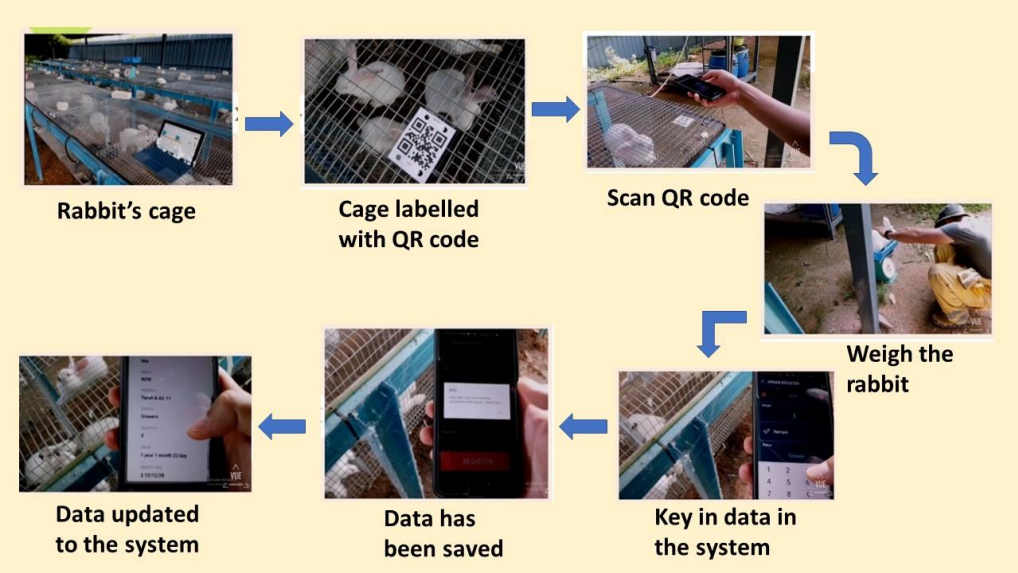


Figure 3: Workflow of Rabbitry System mobile application.

COMMERCIAL POTENTIAL

The development of this Rabbitry System mobile application will help target communities. Farmers, for example, might boost agricultural output by combining traditional livestock practises with modern technological applications. Furthermore, this approach can contribute to a more balanced demand for rabbit meat-based product supply, while traditionally consumers relied solely on product meat-based birds and cows.
Finally, it can pique the interest of the younger generation (graduates) and create new job opportunities in the agricultural business, particularly involving Internet of Things (IOT) for smart farming, thereby lowering the rate of unemployment among the younger population, particularly graduates, by cultivating an interest in modern farming as a career opportunity alternative. Furthermore, this technology has already received Intellectual Property Recognition (IPR), and the next stage is to develop modules and kits for smart agricultural operations.

CONCLUSION

Finally, a low-cost mobile application for monitoring work and rabbit breeding management that can be operated by smartphone or tablet was successfully built. The Open as Apps website allows for the systematic recording and monitoring of all data. Now, the efficacy of livestock production has grown and may be able to maximize farmer revenue in the future. In the future, this technology might be integrated with an accounting program to automatically compute and estimate farmers' sales and profit.

ACKNOWLEDGEMENT

We are grateful to everyone with whom we had the pleasure of working on this project. This project was funded by Universiti Malaysia Terengganu, which allowed us to file for IPR till we had a copy of it. Also, many thanks to Mr. Khairul Anam from Nanny Agrofarm & Rabbitry for his support with his rabbit farm, which served as our subject trial. Finally, we would want to convey our heartfelt appreciation to our family and friends for their encouragement and support in working on this project.

REFERENCES

[1] Mohd Azli Adlan. (2020). Terokai potensi besar ternak Arnab pedaging. 7 May 2023, from https://www.kosmo.com.my/2020/11/01/terokai-besar-ternak-arnab-pedaging/.
[2] Bernama. (2021). Penternakan Arnab berpotensi besar jadi sumber pendapatan. 7 May 2023, from https://www.sinarharian.com.my/article.
[3] Hafiz Ithnin. (2022). Berbaloi ternak arnab, cepat membiak. 7 May 2023, from https://www.hmetro.com.my/agro.
[4] Nur Alina Hassan. (2021). Rebut peluang sertai penternakan arnab. 7 May 2023, from https://www.utusan.com.my/berita/.
[5] Mohd Azri Azman dan Salma Mohamad Yusop (2021). Analisis komposisi nutrien daging arnab dan potensinya sebagai sumber daging alternatif. Buletin Teknologi MARDI Bil. 28, Khas Ternakan Lestari 2 (pp. 211–217). http://ebuletin.mardi.gov.my/buletin/28.
[6] B. Sarwano (year). Penternakan arnab secara komersial, Prospek industri arnab pedaging secara komersial (pp. 129-133). Synergy Media Books, http://agris.upm.edu.my:8080/.
[7] Taman Pertanian Universiti, Universiti Putra Malaysia (2012). Buku Panduan Ternakna Arnab. OPR/TPU/BP/TERNAKAN/Arnab.
[8] Mohd Faisal sharif (2020). Menjana pendapatan koperasi dan anggota : Penternakan Arnab pedaging. Dimensi KOOP Bil.64, ISSN - 1823 - 1586 (pp. 64–72). https://www.ikma.edu.my/images/dokumen/penerbitan/demensi/DIMENSI-KOOP.
[9] Admin UT. (2021). Ternakan arnab jadi tarikan anak muda. 7 May 2023, from https://utusantimur.com/.

30 TO 3000 MAGNETITE

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ABSTRACT

This work presented the extracted magnetite from waste mill scales through an eco-friendly and low-cost approach. The extraction of the magnetite involved two magnetic separation steps which were named as magnetite separation 1, and curie temperature separation technique. The magnetite is then used in removal of copper ions from an aqeous solution. Different milling times were used to reduce the size of the raw mill scale which is 24, 48 and 72 h. The increase in the milling time resulted in the homogenous dispersion of iron oxides particles, the reduction of particle clustering, and the reduction of distances between the particles. Magnetite was characterized using XRD, SEM and particle size distribution. Solubility of the iron oxides increased as the milling time increased. The concentration of copper ions was determined by a spectrometer. As a result, 72 hours milling time had shown highest adsorptions of copper which is 95 % removal efficiency at the optimum conditions. The characterizations of the millscales waste after the process having magnetite XRD spectrum and successfully reduced the size to microparticles. To conclude this, the price of millscales waste from RM30/kg now turned to magnetite can be up to RM3000/kg.

Keywords: Waste mill scales; milling time; iron oxides; Cu ions; removal efficiency (RE)

INTRODUCTION

There have been widespread interested on mill scales as iron oxides sources. On an average, every year, one single steel processing unit produces about 6500 to 8500 tons of mill scale and almost 18-20 million metrics tons of this material is produced every year. Most of the material is dumped landfills. Waste mill scales were believed to have high potential to be explored in many application because it rich with percentages of Fe (~72%) [1]. Therefore, many trials were taken to turn these waste mill scales into valuable product. Relatively mill scale is pure oxide with little contamination. It is magnetic material with typical range 93-95% complement with good properties such porous, hard and brittle. Therefore, this project used to recycle millscales wastes into an metals ions adsorbent.

Waste mill scales was purchased from steel industries. The waste mill scales has flakes shape structure with diameter <1 mm. Copper solution was prepared from copper nitrate ($Cu(NO_3)$). The waste mill scales were conventionally ball milled using a Pascal mechanical

milling for 24, 48 and 72 h. The waste mill scales magnetic separation routes were done similar to previously reported by [2]. The magnetite (Fe_3O_4) yielded from CTST was dried in oven at 120 °C for 24 h.

The structural and phase composition of samples were analyzed from X-ray diffraction (XRD) pattern, characterized using a Philips Expert PW3040 diffractometer operating operated at 40 kV and 40 mA with CuKα radiation (λ = 0.154 nm). The microstructure, particles size and elemental analysis of the samples were observed using a NovaNano 230 field emission scanning electron microscope (FESEM) equipped with Energy-dispersive X-ray spectroscopy (EDX).

INNOVATION DEVELOPMENT

The non-chemical extraction of magnetite from the waste millscales was made possible by the magnetic separation magnetite. Our late Professor Mansor (UPM), who spent years researching mill scale waste and using it widely, served as an inspiration for this effort. The innovative aspect of this invention was the use of magnetite to remove 95% of the metal ions from an aqueous solution. Similar performance to commercial magnetite priced at RM3000/kg. The XRD spectrum as shown in Figure 2, described the behaviour of the magnetite after the magnetic separation and after milling with 3 different time (24, 48, and 72 h).

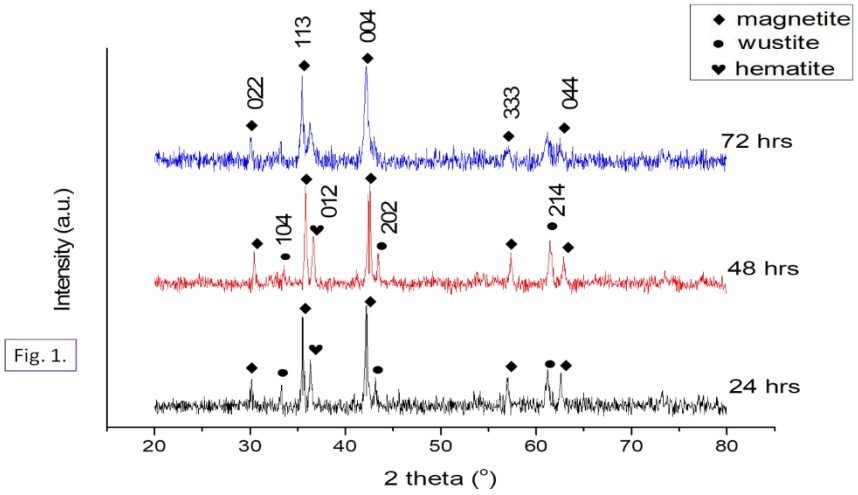


Fig. 1.

Figure 1: XRD spectrum.

The SEM images shown in Figure 2 gave the information on the size of the magnetite after milling with 3 different period. The size og the magnetite after milling for 24, 48 and 72 hours is 30 µm.

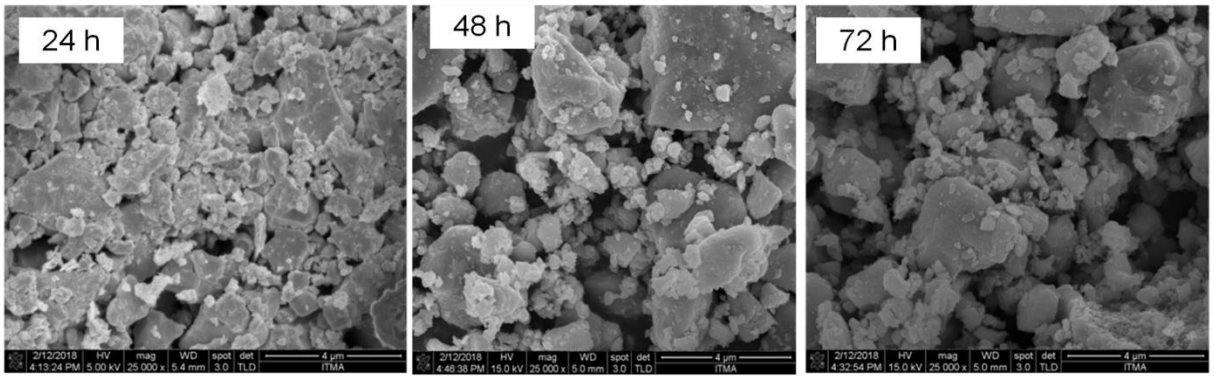


Figure 2: SEM images.

COMMERCIAL POTENTIAL

With numerous industrial uses, magnetite is a mineral that is frequently discovered in iron ore deposits. Millscale is a waste material that contains a sizable quantity of magnetite and is a byproduct of the steel-making process. As a result, magnetite from millscales may be extracted and used for commercial purposes.

The price of millscales waste is RM30.00 per kilogramme. It appears as flakes of millscale trash that contains some pollutants. Then, for 24, 48, and 72 hours, these flakes are subjected to standard milling at 600 rpm. The contaminants are then removed using magnetic separation 1 when the millscales are submerged in water and a magnetic field is applied to the area surrounding the column. The earliest separation techniques are shown in figure 3. A 1 T magnetic field is applied, drawing in the magnetic materials, while the impurities are either floating or completely submerged at the bottom.

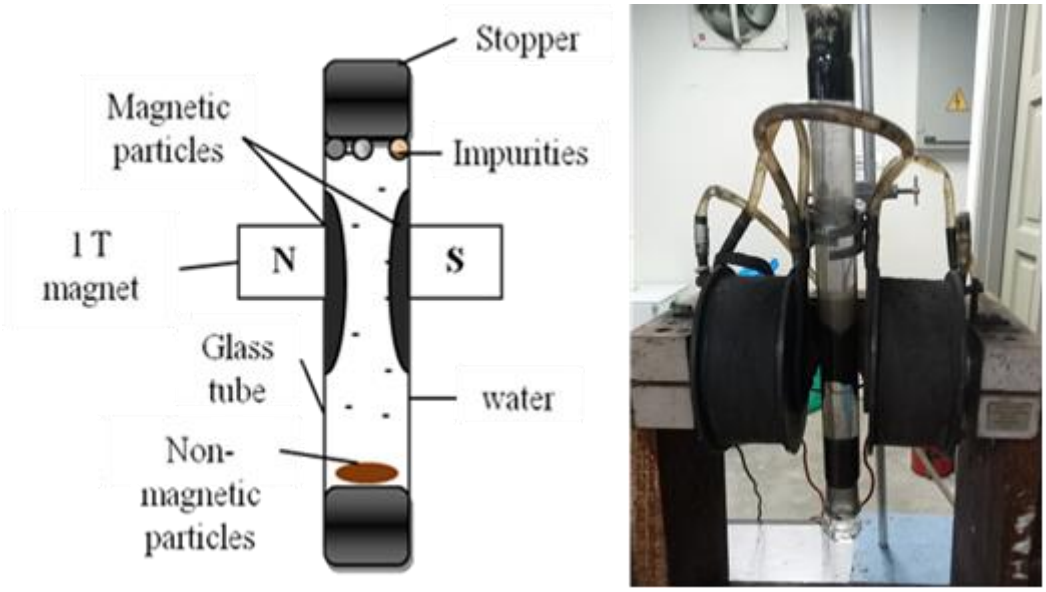


Figure 3: Magnetic separation 1.

To remove magnetite exclusively, a second magnetic separation is used. Wustite has a Curie Temperature of 780C, hence heated water was employed for this purpose in order to cause the wustite to sink to the bottom. Therefore, only magnetite and hematite will be drawn to and left

behind by the magnet's application. This second separation will take place repeatedly for a number of times in order to obtain pure magnetite. The magnetite spectrum is shown by the XRD examination as the outcome. To sum up, this straightforward, non-chemical process extracts magnetite with 99% purity.

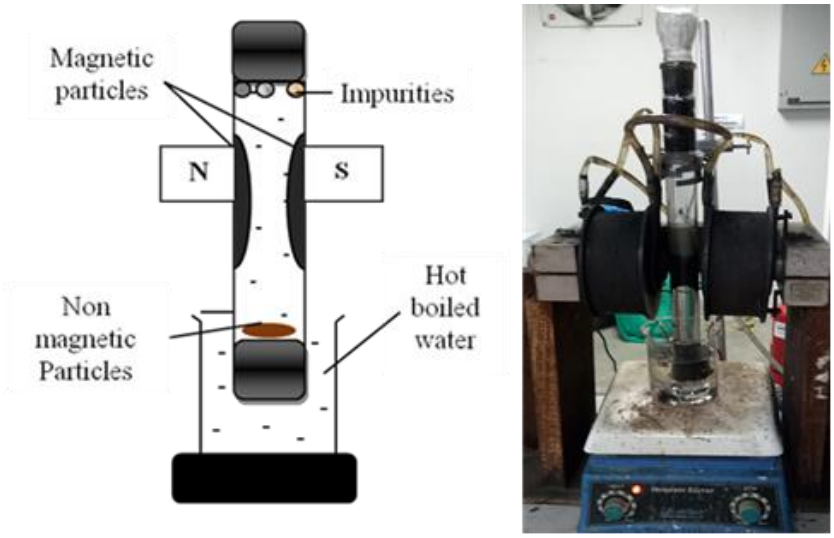


Figure 4: Second magnetic separation technique.

In order to prove that the product was similar to commercial magnetite, the magnetite used in adsorption of copper ions to see the performance. From the study, it was found that the removal percentages is similar to the commercial magnetite. In comparison with the millscales before processed to magnetite also proved when the removal is higher. This can be seen from the Figure 5.



Figure 5: The right tubes is the water samples treated with millscales, in the middle tube was treated using magnetite.

CONCLUSION

In conclusion, the magnetite extracted from waste millscales have the same abilities with the commercial magnetite in removing metals ions from the aqueous solutions. Therefore, 30 to 3000 magnetite have bigger chances to be commercialised.

ACKNOWLEDGEMENT

Thanks to Universiti Teknologi MARA (UiTM) and Universiti Putra Malaysia (UPM).

REFERENCES

[1] Wang, Z., Huang, K., Luo, Y., and Chen, Y. (2021). Utilization of Mill Scale Waste for the Production of Magnetite Nanoparticles. Journal of Environmental Management, 282, 111966. https://doi.org/10.1016/j.jenvman.2021.111966

[2] Azis, R. S., Hashim, M., Yahya, N., Saiden, N. M. (2002). A Study of Sintering Temperatures Variation on Microstructure Developments of Strontium Hexaferrite Millscale-Derived. Journal of Applied Sciences, 2(12), 1092-1095. DOI: 10.3923/jas.2002.1092.1095.

A Study of X-Ray Diffraction (XRD) and Surface Morphology Studies of PVC complexes

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ABSTRACT

In this work, the proton conducting polymer electrolytes were prepared by solution cast technique. Poly (vinyl chloride) PVC is used as the polymer host, ammonium triflate ($NH_4CF_3SO_3$) as the doping salt and ethylene carbonate (EC) and butyltrimethyl ammonium bis trifluoromethyl sulfonyl imide (Bu_3MeNTf_2N) is used as the plasticizers. Characterization techniques of XRD and FESEM were used to study the properties of the PVC based proton conducting polymer electrolytes. XRD studies shows that amorphous PVC becomes largely amorphous in nature upon addition of $NH_4CF_3SO_3$. Largely amorphous in nature is also obtained upon addition of EC and Bu_3MeNTf_2N to PVC-$NH_4CF_3SO_3$. XRD studies of the salted samples showed that they are largely amorphous in nature. However, XRD studies could not identify for sure the most amorphous sample. Identification of the most amorphous sample is imperative as conduction in polymer electrolytes is known to occur in the amorphous region. The FESEM micrographs gave a qualitative idea of the amorphousity of the salted samples in that A4 had the most grey regions in its micrograph giving a strong indication of it being the most amorphous sample. In case of the EC plasticised system, the micrographs showed that the pore size increased with increasing concentration of EC which in turn caused the amorphous regions (grey area) to decrease. This means that B1, which has the smallest pore size and the most grey area is the most amorphous sample. In the micrographs of Bu_3MeNTf_2N plasticised samples, the sample C3 is observed to be more homogeneous with more white spherulites indicating presence of more trapped ionic liquid. This broadly indicates that C3 is the most amorphous due its homogeneity as compared to the sample C1.

Keywords: Polyvinyl Chloride (PVC); X-ray diffraction; surface morphology; polymer electrolytes; amorphous

INTRODUCTION

X-ray diffraction (XRD) patterns and surface morphology of pure PVC and the polymer electrolytes prepared in this work are presented first. X-ray diffraction studies are carried out to compare the nature of crystallinity and study the occurrence of complexation while changes in surface morphology and structure of the polymer systems can be studied via field emission scanning electron microscopy. In the case of Ammonium Triflate (NH4CF3SO3) only the X-ray diffraction pattern will be presented. This is followed by the X-ray diffraction patterns and surface morphology image of the complexes PVC- NH4CF3SO3, PVC-NH4CF3SO3-EC and PVC-NH4CF3SO3-Bu3MeNTf2N due to Tetrahydrofuran (THF) evaporation. These diffractograms and micrographs are presented in order to study the effects of addition of

plasticizer / ionic liquid on the structure of the PVC- NH4CF3SO3 complexes.

INNOVATION DEVELOPMENT

In the present study, XRD is carried out to investigate the effect of adding another polymer, salt and plasticizer to the crystallinity of the PVC. XRD is also used to examine the occurrence of complexation between polymer host and doping salt. Complexation between a polymer host and a doping salt is usually indicated by the shifts of peaks of the polymer host or salt in the XRD spectra. Sometimes, this is accompanied by the absence or the disappearance of some peaks of the salts and/or polymer (Sekhon et al,1995; Mohamed et al, 1997). Complexation may also be indicated by the presence of new peaks in XRD spectra (Acosta and Morales, 1996, Sekhon et al, 1995). The XRD spectra of the proton conducting polymer electrolytes films studied in this work is recorded using X'pert Pro Analytical Diffractometer for Bragg angles (2θ) varying from 5° to 90°.

In order to understand how the surface morphology of the proton conducting polymer electrolyte film changes with doping of salt and plasticizers, field emission scanning electron microscopy of the polymer electrolyte films were taken. The structure and surface morphology of the polymer electrolyte films is an important property for the polymer electrolyte since it gives us qualitative idea of the degree of crystallinity (X_c) of the polymer films. In the present work, field emission scanning electron microscopy (FESEM) is carried out using FESEM, ZEISS SUPRATM 40VP at Faculty of Applied Sciences, Universiti Teknologi MARA. The polymer electrolyte films were coated with a layer of platinum using Sputter Coater under vacuum chamber with argon gas. The polymer electrolyte films were then attached to FESEM stubs using two-sided adhesive tape. The sample is examined at 5 kV for 500x, 3000x and 10000x magnification in order to investigate the different spherulites size of the samples.

COMMERCIAL POTENTIAL

This product has good performance of PVC based proton conducting polymer electrolytes in electrochemical cells. It suitable for potential application as electrolytes in solid-state electrochemical devices like batteries. Applicability of this polymer electrolytes especially in proton electrochemical cells, primary battery for proton battery and energy storage.

Application of Intellectual Property/Copyright was submitted to Intellectual Property Corporation of Malaysia (MyIPO) with the application number LY2022W00007as shown in Figure 1.



AKTA HAK CIPTA 1987

PERATURAN-PERATURAN HAK CIPTA (PEMBERITAHUAN SUKARELA) 2012

SIJIL PEMBERITAHUAN HAK CIPTA
[Subperaturan 8(2)]

No. Pemberitahuan : CRLY2022W00007

Tajuk Karya : FABRICATION OF PROTON CONDUCTING POLYMER ELECTROLYTES BASED ON PVCNH4CF3SO3- BU3MENTF2N FOR PROTON BATTERY

Jenis Karya : SASTERA

Tarikh Permohonan : 03 JANUARI 2022

Saya dengan ini mengesahkan di bawah Akta Hak Cipta 1987 [Akta 332] dan Peraturan-Peraturan Hak Cipta (Pemberitahuan Sukarela) 2012 bahawa karya hak cipta dengan No. Pemberitahuan seperti di atas bagi pemohon **UNIVERSITI TEKNOLOGI MARA** sebagai **PEMUNYA** dan **SITI KHATIJAH BINTI DERAMAN (851101115890), NOR ZAKIAH BINTI NOR HASHIM (860809335164), NAZRIZAWATI BINTI AHMAD TAJUDDIN (840316065364), HUSSEIN BIN HANIBAH (840510145309)** sebagai **PENCIPTA** telah didaftarkan ke dalam Daftar Hak Cipta menurut seksyen 26B Akta Hak Cipta 1987 [Akta 332].

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Figure 1

CONCLUSION

XRD results show that the salt and plasticizers have decreased the crystallinity of PVC and salted PVC-based polymer electrolytes. The complexation between the salt, plasticizers and PVC occurs in the amorphous phase as a result of the decrease in the crystalline regions of the complexes. The surface morphology images give a qualitative idea of the degree of crystallinity of the complexes studied in this work. The surface morphology of the polymer electrolytes provides information on the structure of the materials studied which XRD could not.

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REFERENCES

[1] Sekhon S. S., Singh G., Agnihotry S. A., Chandra S. (1995) Solid polymer electrolytes based on polyethylene oxide-silver thiocyanate, *Solid state Ionics* 80, 37-44
[2] Mohamed, N.S., Zakaria, M.Z., Ali, A.M.M. & Arof, A.K. (1997). Characteristics of Poly (ethylene oxide)- NaI polymer electrolyte and electrochemical cell performance. *Journal of Power Sources* 66:169-172.
[3] Acosta, J.L., Morales, E. (1996) Structural, morphological and electrical characterization of Polymer electrolytes based on PEO/PPO blends, *Solid State Ionics* 85, 85-90
[4] Stephan, A. M., Thirunakaran, R., Renganathan, N. G., Sundaram, V., Pitchumani, S. Muniyandi, N., Gangadharan R. & Ramamoorthy, P. (1999). A study on polymer blend electrolyte based on PVC/PMMA with lithium salt. *Journal of power sources*, 81, 752-758.
[5] Rajendran, S., Uma, T. & Mahalingam T. (2000). Conductivity studies on PVC±PMMA±LiAsF6±DBP polymer blend electrolyte. *European Polymer Journal*, 36, 2617– 2620.
[6] Rajendran, S. and Uma, T. (2000b). Lithium ion conduction in PVC-LiBF4 electrolytes gelled with PMMA. *Journal of Power Sources*, 88, 282– 285.
[7] Rajendran, S., & Uma, T. (2000). Effect of ZrO2 on conductivity of PVC-PMMA-LiBF4-DBP polymer electrolytes. *Bulletin of Materials Science*, 23(1), 31-34.
[8] Srivastava, N., Chandra, A., Chandra, S. (1995) Dense branched growth of (SCN)x and ion transport in the poly (ethylene oxide) NH4SCN polymer electrolyte, *Physical Review B* 52, 225-230.
[9] Maurya, K.K., Hashmi, S.A., Chandra, S. (1992a) Proton conducting polymer electrolytes:polyethylene oxide + (NH4)2SO4 system, *Journal of the Physical Society of Japan* 61, 1709-1716.
[10] Mohamed, N.S., Zakaria, M.Z., Ali, A.M.M. & Arof, A.K. (1997). Characteristics of Poly (ethylene oxide)- NaI polymer electrolyte and electrochemical cell performance. *Journal of Power Sources* 66:169-172.
[11] Hashmi, S.A., Kumar, A., Maurya, K.K., Chandra,S. (1990) Proton-conducting polymer electrolyte II. The polyethylene oxide + NH4ClO4 system, *Journal of Physics D: Applied Physics* 23, 1307-1314.
[12] Gupta, P.N & Singh, K.P. (1996) Characterization of H2PO4 Based PVA complex system, *Solid State Ionics*, 86-88 (1), 319-323
[13] Kim, J.Y and Kim, S.H., (1999) Ionic conduction behavior of network polymer electrolytes based on phosphate and Polyether copolymers, *Solid State Ionics*, 124, 91-99.
[14] Noor, S. A. M., Ahmad, A., Talib, I. A., & Rahman, M. Y. A. (2010). Morphology, chemical interaction, and conductivity of a PEO-ENR50 based on solid polymer electrolyte. *Ionics*, 16 (2), 161-170.
[15] Ramesh, S., Bee, G., & Louh, R. (2010). Preparation and characterization of plasticized high molecular weight PVC-based polymer electrolytes, *35*, 87–95.

Effect of Lights on Oyster Mushroom Indoor Cultivation

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ABSTRACT

Common edible oyster mushrooms are grown extensively over the world. However, the production yields of the oyster mushrooms are lower than the market demand. Additionally, traditional outdoor agriculture uses more area and is seasonal, which brings more unpredictable factors into the cycles of production. In order to save space, indoor production of the oyster mushroom was used in this work to study how the mushroom responded to various light intensities. Red, white, and no light at all were the intensities employed. According to this study, oyster mushrooms grow to their highest stem and cap sizes when exposed to white light, followed by red light and no light. In contrast to white light, oyster mushrooms are more numerous in red light intensities. Finally, it should be noted that the oyster mushroom's growth depends greatly on the light environment. The findings of this study may be useful to farmers in their efforts to increase harvest productivity as well as to other agricultural organisations.

Keywords: Oyster mushroom; light intensity; indoor; cultivation

INTRODUCTION

Mushrooms are the reproductive fruits of mycelium, a thick, root-like network of cells that resembles the fruits that trees produce. The oyster mushroom is easily recognised by its oyster-shaped cap and can be found in a variety of habitats, such as rivers, canals, dead hardwood trees, and woodlands. It is easily cultivable and edible. As a result, this type of mushroom is one of the most popular and in high demand worldwide.

The oyster mushroom is a good source of folic acid, protein, mineral salt, vitamin C, and vitamin B complex. *Pleurotus ostreatus* Lectin (POL), which is extracted from the oyster mushroom, has anti-cancer qualities that are advantageous in the biomedical and biotechnological industries, according to [3]. This is supported by [1,2,7] stated that the POL displays potent antitumoral effects in the fruiting bodies of the oyster mushroom.

The causes of oyster mushroom growth have been the subject of many research studies. The oyster mushroom's growth is influenced by a few different variables. Intensities of nutrients, temperatures, humidity, and lights are a few of these [5,6]. Fruiting bodies' ability to grow is influenced by both the length of the light cycle and the amount of light they get during the day.

The indoor cultivation is an alternative to the conventional outdoor cultivation. The traditional outdoor cultivation requires a larger area and is seasonal, adding greater unpredictability to the production cycles. With the use of IoT, indoor oyster mushroom growing has improved in both number and quality. It can also cover a larger area with less labour, which opens up more viable options for safeguarding the food supply [4].

INNOVATION DEVELOPMENT

In this study, white, red, and no light were used in an indoor cultivation environment while the other factors remained unchanged. The top sections of the three boxes were first taken off and set side by side in a laboratory space. As electricity is needed to turn on the light, the three boxes must be placed close to electrical sources (Figure 1). The first set of oyster mushroom blocks was then made. The set comprises of three oyster mushroom blocks that have been stacked in a pyramid setup and covered with a damp towel (Figure 2). There were a total of three oyster mushroom sets. Box A received a red LED light, while Box B received a white LED. Box C was used to simulate a dark environment. The red and white LED switch was turned on (Figure 3). On the box's base, each set of oyster mushroom blocks was placed. The three boxes were unopened for a week. For two weeks, there were weekly weight checks on the oyster mushrooms (Figure 4). During the weekly checking, the towel was moistened once more to maintain the humidity inside the boxes.



Figure 1: The three boxes were set up side by side close to their electrical sources



Figure 2: The three oyster mushroom blocks been stacked in a pyramid setup

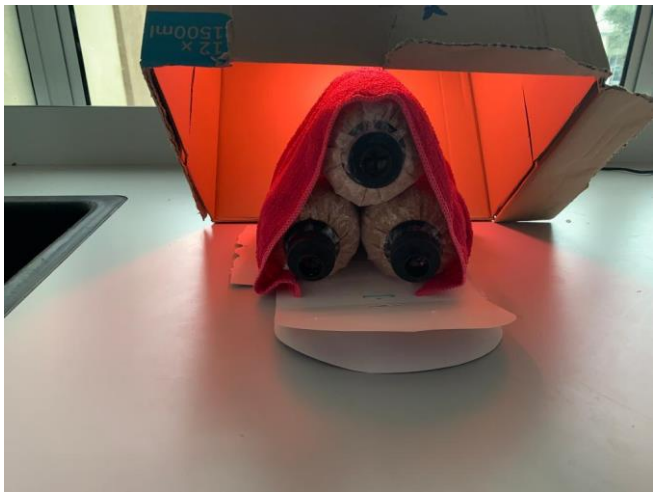


Figure 3: The red LED switch was turned on



Figure 4: Weekly weight checking

COMMERCIAL POTENTIAL

The market for oyster mushrooms is very large worldwide. The production cycle of each oyster mushroom can last up to three months, and the harvesting of oyster mushrooms can occur weekly. By offering the best factors for oyster mushroom cultivation, it increases both the farmer's and other agricultural organisations' harvest productivity. As a result, it boosts the community's economy, particularly for the farmers. The findings of this study could assist farmers in maximising oyster mushroom weight and quantity during indoor cultivation by taking light intensity into account. Any household can grow mushrooms at home, which reduces household spending and requires less space for indoor cultivation.

CONCLUSION

The objectives of this research of enhancing oyster mushroom cultivation have been met. Additionally, this research was successful in optimising the culture house, such as the building blocks for oyster mushrooms to form, and in determining which source of light would facilitate the process of cultivation. One of the challenges was to keep the mushrooms in a wet environment. Additionally, it is a challenge to guarantee that no other elements disrupt the

growing process. In conclusion, the future actions that must be conducted are concerned with the consistency of checking mushroom growth every two days. The precision of the data recording will be enhanced by this step.

ACKNOWLEDGEMENT

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REFERENCES

[1] Conrad, F., & Rüdiger, H. (1994). The lectin from *Pleurotus ostreatus*: purification, characterization and interaction with a phosphatase. Phytochemistry, 36(2), 277-283. https://doi: 10.1016/S0031-9422(00)97061-4.

[2] Kawagishi, H., Suzuki, H., Watanabe, H., Nakamura, H., Sekiguchi, T., Murata, T., Usui, T., Sugiyama, K., Suganuma, H., Inakuma, T., Ito, K., Hashimoto, Y., Ohnishi-Kameyama, M., & Nagata, T. (2000). A lectin from an edible mushroom *Pleurotus ostreatus* as a food intake-suppressing substance. Biochim Biophys Acta, 1474(3), 299-308. https://doi.org/10.1016/S0304-4165(00)00027-1.

[3] Massimiliano, P., Laura D., Michele, B., Monica, G., Francesca, M., Michael, A., Fabio, F., Hugo, L M., & Stefano, C. (2020). Structure and properties of the oyster mushroom (*Pleurotus ostreatus*) lectin, Glycobiology, 30(8), 550-562, https://doi.org/10.1093/glycob/cwaa006.

[4] Mohammed, M. F., Azmi, A., Zakaria, Z., Tajuddin, M. F. N., Isa, Z. M., & Azmi, S. A. (2017). IoT based monitoring and environment control system for indoor cultivation of oyster mushroom. Green and Sustainable Computing, 1019(7), https://doi.org/10.1088/1742-6596/1019/1/012053.

[5] Sakamoto, Y., Sato, S., Ito, M., Nakahori, K., & Muraguchi, H. (2018). Blue light exposure and nutrient conditions infuence the expression of genes involved in simultaneous hyphal knot formation in *Coprinopsis cinereal*. Microbiol Res, 217, 81-90, https://doi.org/10.1016/j.micres.2018.09.003.

[6] Tariqul, I., Zarina, Z., Nasrul., H., & Ishak, M. (2017). Selection and Cultivation of Oyster Mushroom for the Indoor Controlled Environment in Malaysia and Similar Ecological Region. MAYFEB Journal of Agricultural Science. 1, 14-22.

[7] Wang, H., Gao, J., & Ng, TB. (2000). A new lectin with highly potent antihepatoma and antisarcoma activities from the oyster mushroom *Pleurotus ostreatus*. Biochem Biophys Res Commun, 275(3), 810–816, https://doi: 10.1006/bbrc.2000.3373.

CATEGORY B
Postgraduate/Undergraduate

Innovation of File Folder Using the Implementation of Augmented Reality Technology and QR Code

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ABSTRACT

According to Fariza Binti Khalid (2017), it proven that the use of technology in education to increase the level of student motivation where the most advanced technology in education is Augmented Reality and QR codes on a file folder. The file folder function as a document repository, which can store multiple sheets of paper renewed with a new concept of folder design and a combination of Augmented Reality technology innovation and QR code, when scanned will display the printing process of the machine and Printing Technology program e-books. Combination Augmented Reality and QR codes to solve problems and advance education in order to encourage more SPM and STPM graduates to enrol in Printing Technology Program courses. A total of 30 students from the Printing Technology course filled out a questionnaire and evaluated the importance of Augmented Reality elements and QR codes. When all the files in this folder are used, it means that it achieves the necessary objectives to meet the needs of lecturers and students. In conclusion, the production of file folders should be combined with the innovation of Augmented Reality and QR code so that students or others can easily get more information in the Printing Technology course.

Keywords: File folder; Augmented Reality; QR code

INTRODUCTION

A file folder, sometimes known as a folder summary, is a type of folder used to organize and protect documents. Working papers are usually stored in file folders, which are usually made from thick sheets of paper stock or thin material. Most of them are sometimes used at home as common storage rather than for formal purposes. In addition, File Folders are often used by core organizational tools of bureaucracy, business administration, and scientific management where many file folders are used to store documents and also for learning purposes in Education. Among Education using the folder file is the Printing Technology course at Universiti Teknologi MARA (UiTM) Cawangan Selangor Kampus Puncak Alam. Printing Technology is a course offered at UiTM Puncak Alam where UiTM is the only public university that offers a Diploma and Bachelor's Degree (Honours) program in the field of Printing Technology in Malaysia. This program course is held in the form of theoretical and practical training where this program emphasizes aspects of administrative management and current printing technology, covering advertising, commercial printing, publishing, packaging, distribution, marketing as well as technology and digital development. In this paper, we examine the use of Augmented Reality and QR code innovation on file folders and identify the advantages of file folder innovation on the academic mission of education.

To create innovation, we must think outside of what we are doing now and develop creative ideas that will increase the level of creativity within us. Innovation requires three main steps which are the idea, the implementation idea, and the results that arise from implementing the concept and producing changes in the folder file design. The folder file to innovate for use in the printing technology course is Augmented Reality and QR codes where global technology advances especially the use of the internet and smartphones. Augmented Reality defines as a direct or indirect real-time view of the physical real-world environment that has been enhanced/augmented by adding virtual computer-generated information to it [7]. AR is interactive and registered in 3D and combines real and virtual objects [7]. A file folder that uses Augmented reality and QR code which is an innovation that can increase student motivation and also help the academic mission. According to Fariza Binti Khalid (2017), Augmented reality technology was created by Morton Heilig in 1962 who defined Augmented reality as a situation where users can see a combination of virtual objects and the real world in real-time [2]. In addition, a quick response (QR) code is a two-dimensional barcode (see opposite) that can be read on a device such as a mobile device (camera phone) or a computer laptop that, once accessed, will allow you to complete an action [9]. QR codes are a technological advancement that brings innovative applications to education as conventional education evolves with new technology joining more students in an active environment. Therefore, the use of Augmented reality and QR codes in education can increase the innovation of student learning methods to advance a more technological learning system. This study aims to identify the combination of file folders with Augmented Reality and QR codes that are suitable for application in education so that the effectiveness of using this material as a delivery of information and reading materials can have a positive and effective effect on users, especially university students, and outsiders who register in the Printing Technology course.

INNOVATION DEVELOPMENT

A file folder is a piece of plastic or cardboard folded down the middle and used for keeping loose papers with a new design as a comprehensive storage material for documents (Cambridge Dictionary). The tool works in storing assignment materials or conveying information when combined with Augmented Reality technology and QR code. AR allows digital information to be superimposed and integrated into our physical environment where AR is a tool that can help us transform our immediate environment into a learning, work, and entertainment space as a novelty, as shown in Figure 3. This storage is designed to facilitate management and storage for a paper that does not exceed 60 sheets of similar 80gsm paper. File folders usually have the same function with various shapes and visual designs but they can innovate with the combination of Augmented Reality and QR Code. Augmented Reality and QR code on the file folder aim to facilitate the delivery of information and academic promotion in the printing technology course about the scope of the program. This file folder is used as an educational strategy to help improve the admission of new students who are doing the academic mission. The attraction of prospective students or students of the Printing Technology course through this innovation file folder will be more effective, and students will be able to understand and receive information about the course more quickly.



Figure 1: Innovation File Folder Technical Drawing

File Folder innovation using The Implementation of Augmented Reality Technology and Qr Code started by using 270gsm paper art cards for printed products that can be used as document storage, especially in education. This file folder innovation can be seen as a set of structured materials for now. Folder file design in printing technology course education can support the purpose of the course in academic mission and use in learning time. prospective SPM and STPM students can also easily read from the file folder. Alternatively, outsiders can find out more clearly the content and background of this program on the e-book provided in the form of QR codes and also Augmented Reality technology. Augmented Reality (AR) uses videos related to learning in printing technology courses to simulate how the printing press process works in a nutshell. In addition, the use of QR codes on file folder elements can make it easier for you to open an e-book about the Printing Technology program without typing on the website by simply scanning it with a smartphone camera. Printing Technology course folder files are almost all used by students and outsiders during academic missions. A total of 30 students of the Printing Technology course filled out a questionnaire and evaluated the use of augmented reality elements and QR codes on file folders which use of these elements was more effective and innovative. The innovation in this file folder makes it important for students to build and increase their motivation. When Augmented Reality and QR codes become a part of human life, education can change with more advanced and technological, so the main goal is to attract the interest of teenagers and promote SPM and STPM teenagers to register for this course. The innovation is focused on the collection and integration of Augmented Reality and QR codes on file folders necessary for education, especially academic missions.

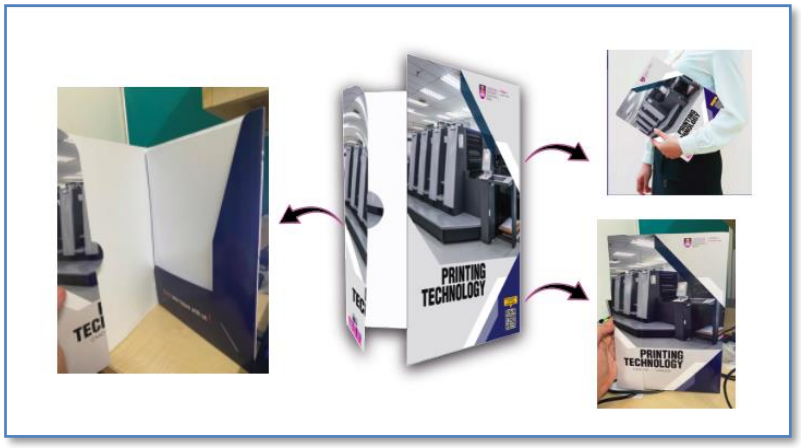


Figure 2: File Folder innovation

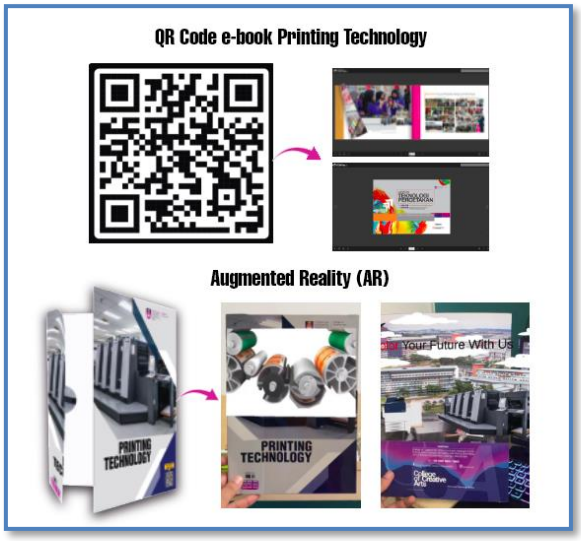


Figure 3: File Folder Innovation with Augmented Reality and QR code

COMMERCIAL POTENTIAL

The commercialization potential of this file folder is quite limited in its use in education due to the use of online learning platforms and educational technology. Nevertheless, the commercialization potential in education is also important, because education is a huge market with many opportunities for companies to provide innovative products and services such as new file folder designs with a combination of Augmented reality (AR) and QR codes in addition to its functionality to organize and store paper-based documents as showing at figure 4. This innovation can develop and market a file folder specifically designed for use among students or lecturers by scanning using a smartphone. The use of file folders will continue to be used when a total of 30 Printing Technology course students give feedback in answering a questionnaire about the use of Augmented Reality (AR) elements and QR codes on file folders as one of the innovative ways to move towards technology. At the same time, it can improve education to encourage more SPM and STPM graduates to follow the Printing Technology Course Program. This folder is not only for storing documents but can also help convey information easily and quickly. Identifying the market to market this file folder, is done when the number of students in the Printing Technology course at MARA University of Technology 220 all the students in this course and all students will use it while learning here.



Figure 4: Innovation Product mock up and prototype

CONCLUSION

In conclusion, the use of this file folder is very helpful for use because it functions as a storage for many paper documents and is able to protect against damage and loss. The production of this folder file can also provide convenience to the field of printing technology in using data storage and easy to manage and organize for more than one paper document not only that this field of Printing Technology file folder has been innovated by incorporating Augmented Reality and QR code so that students or others can find out more information in the Printing Technology course. When all the files in this folder are used, it means that it achieves the necessary objectives to meet the needs of lecturers and students.

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REFERENCES

[1] Pozi, F. N. S. M., & Khalid, F. (2017, April). Kesan teknologi augmented reality dalam pendidikan terhadap peningkatan motivasi pelajar. In International Conference on Global Education V "Global Education, Common Wealth, and Cultural Diversity (Vol. 2, No. 29, pp. 1200-1209).
[2] Ong, S. W., & Kutty, F. M. (2022). Potensi Penggunaan Augmented Reality dalam Meningkatkan Motivasi dan Penglibatan Murid Pemulihan dalam Aktiviti Penulisan. Malaysian Journal of Social Sciences and Humanities (MJSSH), 7(3), e001366-e001366.
[3] Srinounpan, B., Srinounpan, C., Sumethokul, P., & Patwary, A. K. (2020). The application of qr code technology to create the value-added products for the baan klong peek neur beehive community enterprise group at tambon suankhan, nakhon si thammarat province. Systematic Reviews in Pharmacy, 11(7), 519-528.
[4] Yang, X., & Yang, M. (2021). Application of visual elements in product paper packaging design: An example of the "squirrel" pattern. Journal of Intelligent Systems, 31(1), 266-280. https://doi.org/10.1515/jisys-2021-0195
[5] Widiyanto, A., & Rifa'i, A. (2014). User manual with augmented reality to support packaging products.
[6] Billinghurst, M. (2002). Augmented reality in education. New horizons for learning, 12(5), 1-5.
[7] Berryman, D. R. (2012). Augmented reality: a review. Medical reference services quarterly, 31(2), 212-218.
[8] Murugesan. (2023, January 9). Folder Design | Presentation Folder Design | Folder Design Ideas. All Time Design. https://alltimedesign.com/folder-design/
[9] Ramsden, A. (2008). The use of QR codes in Education: A getting started guide for academics. Accesible desde< http://zabdulkhaaliqcapstone. yolasite. com/resources/getting_started_with_QR_Codes. pdf, 28(10), 2014.

Design and Development of Handle Packaging for Croffle with QR Code and Augmented Reality Technology

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ABSTRACT

The packaging of food products plays an important role in attracting customer interest. There are many quality products that have been produced by Small and Medium Enterprises (SME) entrepreneurs, but fail to enter the foreign market. In era of Industrial Revolution 4.0, most packaging printing technology is more focused on the development and improvement of comfort for customers. Because, today most customers do not accept certain packaging, especially food packaging, which is food packaging in plastic containers, food is put in a plastic bag. So, it will easily roll in the plastic bag and can cause the condition of the food to be affected. Packaging comes out with the name handle packaging; it is designed with the objective to produce stable food packaging to maintain food quality and easy for customers to take anywhere. In addition, the material used is from 270 gsm art cards, which is easy to recycle and environmentally friendly. This packaging innovation renewal has been done as an additional feature to give a wide impact on a brand and also includes elements of Augmented Reality and QR codes, this is a current technology that allows customers to easily obtain information by simply scanning.

Keywords: Handle packaging; Augmented Reality (AR); QR code (QR)

INTRODUCTION

Referring to the Dictionary and Library, packaging is defined as a container that has a direct relationship with the product itself, it holds, protects, stores, and identifies the product in addition to facilitating the management process and commercializing the product. There are various types of packaging including handle packaging. Handle packaging, sometimes known as packaging summary is a process to protect and inform, but packaging can be used as an instrument to promote marketing offers as well as to increase sales. This packaging handle is usually made of paper that is not thin or thick according to the product's characteristics. In addition, good packaging helps to identify and differentiate the product from consumers. Packaging is used for easy shipping and safety purposes. In this paper, we examine innovation

in food packaging, to produce stable food packaging to maintain food quality and easy for customers to take anywhere and design packaging with an interesting and innovative concept integrated with Qr code and augmented reality for products food.

Innovation and evolution are essential for individuals, people, and nations to survive and progress. Innovation in food products aims to improve resource efficiency, eliminate waste and reduce environmental impact through better design and the use of alternative materials. In packaging design, innovation renewal is done to greatly impact a brand. Augmented Reality is one of the new and latest technologies more and more popular. Augmented Reality is now more widely used in the field of entertainment and is no exception also in the field of education [1]. Handle packaging that uses augmented reality and QR codes is an innovation that can increase creativity and improve branding. AR technology on packaging handles is an added value to apply fun elements and attract customers to approach new markets [1]. AR is a state between reality and the virtual world [7]. In addition, a quick response (QR) code is a two-dimensional barcode (see opposite) that can be read on a device such as a mobile device (camera phone) or laptop which, once accessed, will allow you to complete an action [6]. Therefore, the use of Augmented reality and QR codes in the field of entertainment or food can increase the innovation of customer attraction in developing a company more technologically. This study aims to design packaging with an interesting and innovative concept that is integrated with QR codes and Reality as the delivery of information and reading material can have a positive and effective effect on users, especially regular customers from KaffelBait.

INNOVATION DEVELOPMENT

KaffelBait has no packaging for its products. In addition, products purchased by customers to take home only use plastic food containers and will be placed in plastic bags only. This causes the food to easily roll in the plastic bag. The development of innovation by creating a handle packaging design aims to protect the product from any damage or easily roll up, especially when you want to handle it to take it anywhere.

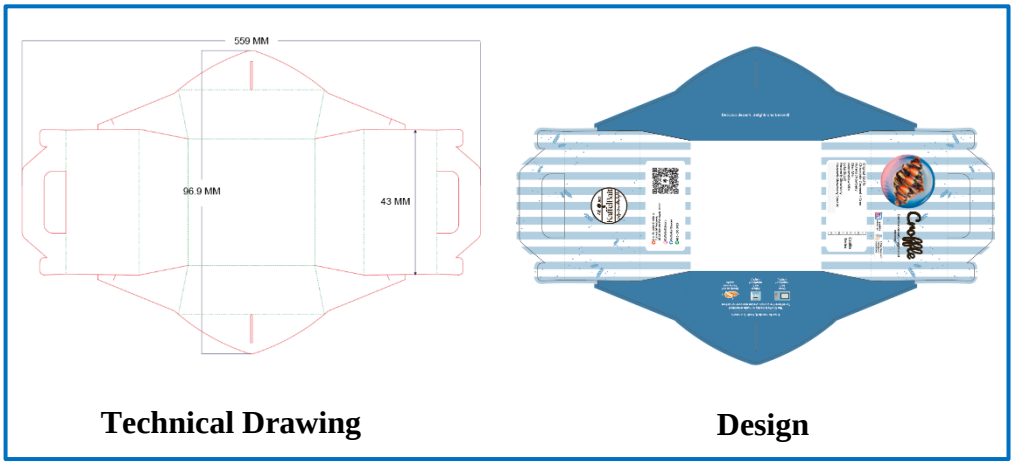


Figure 1: Handle Packaging Technical Drawing

Innovation development in handle packaging also has its Augmented Reality (AR), which enables digital information to be superimposed and integrated into our physical environment. Additional features with a combination of Augmented reality have been widely used using interesting rendering techniques to display 3D objects, animations, audio, and video by simply scanning the smartphone camera toward a specific image that has been

designed. AR is a tool that can help us transform our immediate surroundings into learning, work, and entertainment spaces as its novelty, as shown in figure 4. Figure 4 shows that this packaging contains a QR Code, so that customers can scan the qr code using a smartphone to deliver information quickly. The handle packaging has also used the benefits of social media, such as WhatsApp, Instagram location and so on for advertising, inquiry and commercials. To produce the handle packaging using material suitable for the product on this packaging is an Art card 270 gsm one side coated and the selection of this Art card is suitable because it can withstand durability when the item is inside the box. The result of the combination of Augmented reality and Qr code on the packaging handle is intended to facilitate the delivery of information and can be used as promotional material to further introduce a company. Handle packaging is used for commercial purposes, a marketing strategy to attract customers.



Figure 2: Product Mock up

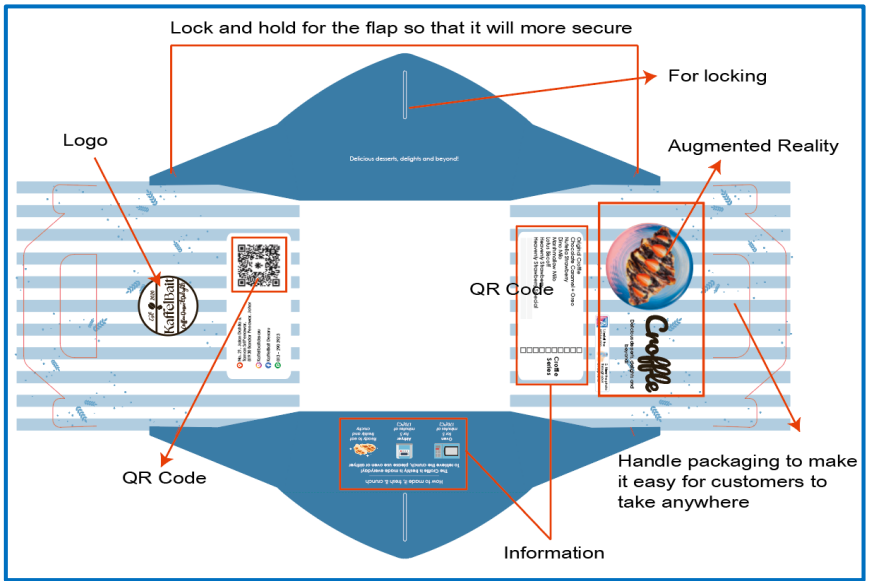


Figure 3: Handle packaging with labelling



Figure 4: Handle Packaging Innovation

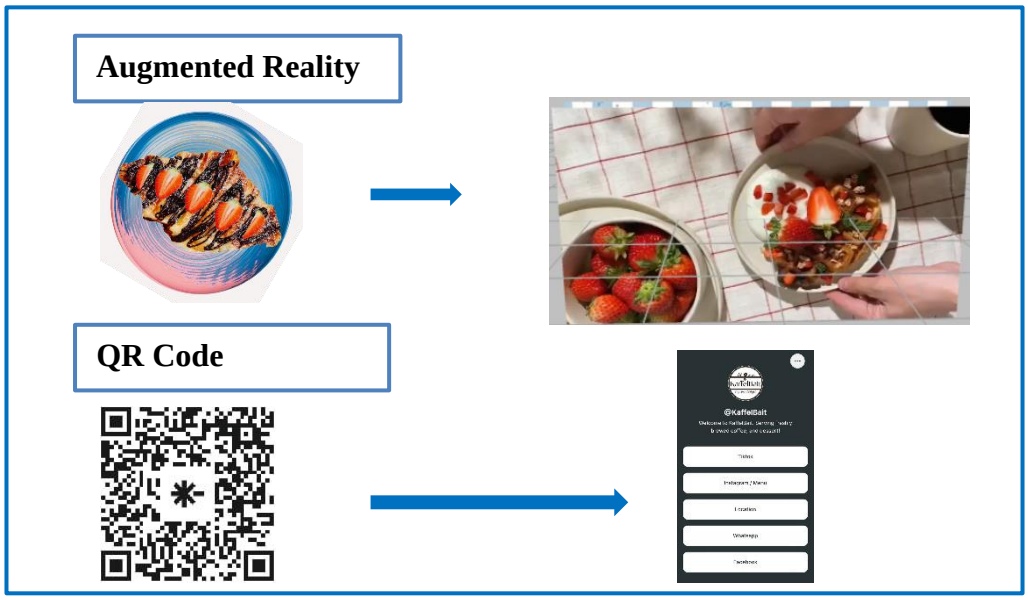


Figure 5: Handle Packaging Innovation with Augmented Reality and QR code

COMMERCIAL POTENTIAL

Commercialization potential is moving an innovative technology or concept from the idea stage to the market. In other words, technology commercialization is usually defined as creating a product suitable for a specific market at a reasonable price that meets market demand. Nevertheless, the commercialization potential in the food field is important because it is a market where there are many opportunities for companies to provide innovative products and services such as designing new packaging handles with the addition of advanced technology such as augmented reality and QR codes. This innovation can develop and market handle packaging specifically designed for use in the community by scanning a smartphone.

CONCLUSION

In conclusion, the use of handle packaging on this food is very important because it serves to preserve food quality and minimize food waste. The right packaging handle will protect the food product from any physical damage or easy rolling when you want to handle it to take it anywhere. The production of handle packaging has also been innovated by combining augmented reality and QR codes so that the public or customers can find out more information

about the KaffelBait company. When this packaging handle is fully used, then this means that the objective has been achieved to meet the needs of KaffelBait.

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REFERENCES

[1] Aziz, S. A., Abd Rahman, K., & Othman, H. (2020). Analisis Rekabentuk Aplikasi "Augmented Reality" bagi pembelajaran Komponen Sistem Unit Komputer. In *Proceeding of 6th International Conference on Information Technology & Society (ICITS)*.

[2] Abas, H., & Badioze Zaman, H. (2011). Visual learning through augmented reality storybook for remedial student. In *Visual Informatics: Sustaining Research and Innovations: Second International Visual Informatics Conference, IVIC 2011, Selangor, Malaysia, November 9-11, 2011, Proceedings, Part II 2* (pp. 157-167). Springer Berlin Heidelberg.

[3] Han, J.H. (2014). A review of food packaging technologies and innovations. Innovations in food packaging, 3-12

[4] Phyu, T. M., Chaoruangrit, A., & Pasuwa, P. (2019). Food safety assessment of food handlers in the canteens of Khon Kaen University. Asia-Pacific Journal Of Science and Technology, 24(2).

[5] Raheem, D. (2013). Application of plastics and paper as food packaging materials-An overview. Emirates Journal of Food and Agriculture, 177-188.

[6] Ramsden, A. (2008). The use of QR codes in Education: A getting started guide for academics. *Accesible desde< http://zabdulkhaaliqcapstone. yolasite. com/resources/ge*

[7] Ramli, R., Nordin, F., Nordin, A., Ahmad Sokri, N. E., & Sokri, A. (2018). TEKNOLOGI REALITI LUASAN: SATU KAJIAN LEPAS Augmented Reality Technology: A Literature Review. *no. May*.

[8] Tiwari, S. (2016, December). An introduction to QR code technology. In 2016 international conference in information technology (ICIT) (pp. 39-44). IEEE

[9] Waheed, S., Khan, M. M., & Ahmad, N. (2018). Products packaging and consumer purchase intentions. Market Forces, 13(2).

The Creation of Innovation Packaging from Plastic to a Handle Box with Implementation of Augmented Reality Technology and QR Code

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ABSTRACT

The creation of technological innovation used on packaging is aimed at increasing creative thinking and innovative approaches in standard of product. Production of Augmented Reality (AR) and QR codes placed on Box Handle Packaging. With the Augmented Reality (AR) technology available, customers can scan the product logo on the packaging to watch the video of how curd is prepared. Through this innovation, it can open people's eyes to see ideas on how to best educate the currently global and techno savvy students. The QR codes are also an innovation that creates commercialization purposes to provide details about the product. The packaging design will be able ease customers bring the product to home after purchase. Besides, the handle box packaging have the look of innovation that creation of transform packaging from plastic to a box with compartment. Adding a handle to the box packaging not only creates an attractive image, it is also keep a product secure and improve the level and standard of the products. Significantly, this creation of handle box innovation packaging can entice customers to buy the product. The creative and eye-catching innovation made the packaging help to attract new and returning customers.

Keywords: Handle box packaging; Augmented Reality (AR); QR code

INTRODUCTION

Box handle packaging have the look of innovation that creation of transform packaging from plastic to a box with compartment. Adding a handle to the box packaging not only creates an attractive image, it is also a step that works to keep a product secure and to improve the level and standard of the products. Not only that, there is a window designed on this packaging to attract customers with a different packaging innovation that provides a complete package containing 2 packets of curd powder (100grams) + cup and flavour that can be seen from outside the box. The most important function of packaging is to keep the product safe and secure from the outside environment, but also vice versea. In addition, the implementation of Augmented Reality (AR) technology is placed on the company logo found on the packaging. So, with this new technology available, customers can directly scan the logo through the downloaded application. On this logo, I included the curd preparation method that customers can watch.

Through the technology innovation, Augmented Reality (AR) for packaging helps relay packaging information through 3D content. Refers to the box handle packaging using the augmented technology app, it can spring in different colors, move, sound and change. As a result, the application quickly realized that customers remember mostly not the thing they see but the emotions it awoke in them. Nowadays, insert augmented technology on the packaging lead their audience into the digital world, which opens more opportunities to engage them. By capturing the physical packaging in their smartphone's camera and using the AR application, the consumers can see the whole message the brand wanted to communicate to them. For example, consumers can scan the product logo on the logo product to watch the video of how curd is prepared. In fact, augmented reality has incredibly useful applications in the packaging industry. This fascinating technology can be used to enhance product packaging, improve brand loyalty, attract new customers, and stand out from competitors. However, one of the great things about Augmented Reality for packaging is the easiness of update. For example, company can launch a special campaign connected to an event or promotion and enhance it with AR content developed specifically for that purpose to all consumer. While, Quick Response (QR) codes are two-dimensional barcodes that, when scanned with tablet or smartphone's camera, give consumer easy access to whatever online information they're linked to. QR codes that align with the products a consumer purchased, and link them to a demo that teaches them how to use your products. QR codes are a simple, seamless solution that makes this much more convenient. With a quick, simple scan, users are instantly taken to your social media pages to follow you. Or, the code can bring up your website for them to leave a review or browse new products.

INNOVATION DEVELOPMENT

The packaging is a presentation or enclosing of material used in protecting products for distribution and storage. The use of material suitable for the product on this handle box packaging is 300gsm Art Card. This packaging is printed on one side printed using one die cut block. Based on the old product packaging, they promote their product with transparent plastic with sticker label which is less than an adequate packaging. Improving the packaging to be better can actually add to give variety and uniqueness to the innovation of packaging. To create innovation, box handle packaging handed out awards to outstanding flexible package solutions that met or exceeded needs through innovation in materials, graphics, structure, new uses, extended shelf-life and sustainability. The innovative packaging that allows the consumer to be able ease customers bring the product to home after purchase. Besides that, the new packaging have the compartment that can secure the product in the packaging and protect the product from damage. Notably, creative and eye-catching innovation made the packaging visually could help to attract new and returning customers. Nowadays, the application of augmented reality technology provides an opportunity for packaging design innovation, provides ideas to enhance the experience of packaging design, and adds interaction between packaging design and users as well, thus making the product more interesting.

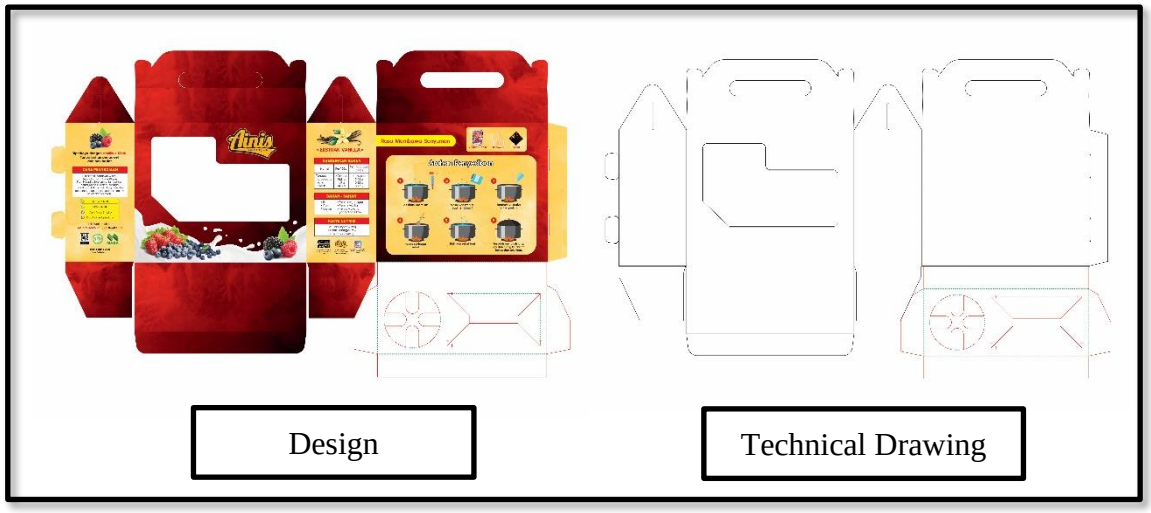


Figure 1: Innovation of Box Handle Packaging Technical Drawing

Box handle packaging usually have the same function with various shapes and visual designs but they can innovate with the combination of Augmented Reality (AR) and QR Code. With the creation of Augmented Reality, an innovative practice of blending real life with virtual life by using applications and images that blend content or products together in the real world. When used in packaging, it takes visual attractiveness beyond eye-catching colours and graphic designs and becomes futuristic. It provides consumers with more than just additional information, but an immersive experience from the moment they interact with the product. For instance, consumers can scan the logo on the product packaging to watch the video and sound of how curd is prepared. Through the downloaded application, any smartphone with a camera and internet capabilities will allow its user to access the world of augmented reality through a downloaded software application. In particular, product packaging is meant to protect products from any damage. A good packaging serves both technical and presentational purpose. Technical changes to the packaging aim to extend the shelf-life of the product by better protecting the product from all the hazards. The packaging created using good and strong material. So the packaging is a presentation or enclosing of material used in protecting products for distribution and storage.



Figure 2: Box Handle Packaging Innovation



Figure 3: Box Handle Packaging Innovation

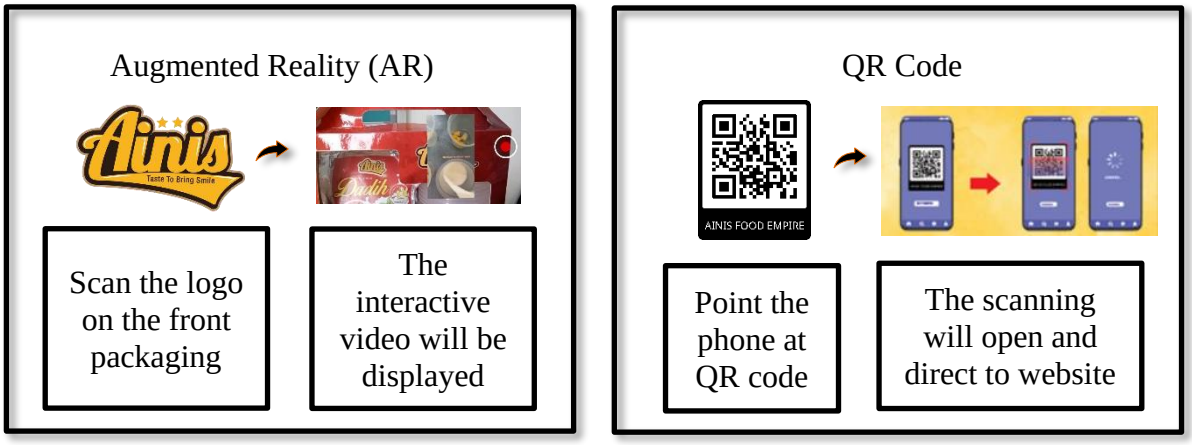


Figure 4: Creation Innovation of Augmented Reality (AR) and QR Code

COMMERCIAL POTENTIAL

The commercialization potential of this box handle packaging can entice customers to buy the product. The packaging could help protect and serve commercialize purposes to provide proper information and details about the product. With the new technology available, customers can scan the packaging box to watch a video of how curd is prepared. Within mind, customers experience will be improved and the brand could gain their trust. The packaging created using good and strong material. So, the packaging is a presentation or enclosing of material used in protecting products for distribution and storage. Thus, the product is suitable for placing on the market in the future and attractive for customers to buy. Furthermore, through the innovation of Augmented Reality (AR) and QR code downloaded application, any smartphone with a camera and internet capabilities will allow its user to access. By capturing the physical packaging in their smartphone's camera and using the AR application, the consumers can see the whole message the brand wanted to communicate to them while through the QR Code, consumer can direct to their website.



Figure 5: Innovation Product Mock Up

CONSLUSION

In conclusion, the use of noble and innovative packaging contributes to extending the shelf life and maintaining the quality of the product. The purpose of packaging is protection, suspicion, information and the convenience of innovative packaging that not only preserves food quality but also contributes meaningfully to business processes. The packaging of this box holder to the product improves the old packaging strategy to the present and renews it with the production of Augmented Reality (AR) and the QR code is placed on Box Holder Packaging. With the advancement in the area of technology, the creation of innovations used on packaging is purposeful improve creative thinking and innovative approaches in the standard product.

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REFERENCES

[1] Vyas, H. (2015). Packaging Design Elements and Users Perception: a context in fashion branding and communication. *Journal of applied packaging research*, *7*(2), 5.
[2] Todorović, V., Milić, N., & Lazarević, M. (2019, July). Augmented Reality in Food production traceability–use case. In *IEEE EUROCON 2019-18th International Conference on Smart Technologies* (pp. 1-5). IEEE.
[3] DuPuis, S., & Silva, J. (2008). *Package design workbook: The art and science of successful packaging*. Rockport Publishers.
[4] Pula, K., Parks, C. D., & Ross, C. F. (2014). Regulatory focus and food choice motives. Prevention orientation associated with mood, convenience, and familiarity. *Appetite*, *78*, 15-22.
[5] Risch, S. J. (2009). Food packaging history and innovations. *Journal of agricultural and food chemistry*, *57*(18), 8089-8092.
[6] García-Arca, J., González-Portela, A. T., & Prado-Prado, J. C. (2014). Packaging as source of efficient and sustainable advantages in supply chain management. An analysis of briks. *International Journal of Production Management and Engineering*, *2*(1), 15-22.
[7] Konopelko, M. (2019). Augmented reality packaging in food & beverages industry.
[8] Widiyanto, A., & Rifa'i, A. (2014). User manual with augmented reality to support packaging products.

Tackling Smart City Traffic Congestion

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ABSTRACT

One of the key issues noticed in traffic light points is that many vehicles queue and wait for a long time to cross the traffic light signal even if there is no pedestrian to cross the zebra cross. This time-consuming ineffective traffic control system, as a result, increases the growth of energy loss and harmful gas loss to the environment. In this study, a smart automated traffic control system later named OptiTraffic was developed to capture real-time data and make judgments automatically in order to efficiently and effectively handle the traffic control system. The basic goal of this technology is to automatically detect pedestrians and enable them to cross the road. As a result, reducing the line of vehicles at the traffic light because the traffic signal would not be halted for oncoming vehicles until there are genuine people waiting to cross the road. The smart system utilized deep learning, Raspberry Pi microcontroller, pressure sensors and cameras to collect real-time data and make choices on the pedestrian traffic light management system. The system has cameras along with pressure sensors to validate the pedestrians waiting at the side of the road to cross the road. In this study, the YOLOV5s deep learning model was trained and integrated with the microcontroller to detect pedestrians using the camera. The timer shall turn on for a short period of time when pedestrians get detected at the side of the road. When the stated time of the timer turns on, the system shall turn on the green light for pedestrians in order to allow the pedestrian to cross the road. The input from both the camera and the pressure sensor would act as a confirmation that the pedestrian is certainly willing to cross the road. The final prototype outcome is a complete success as per the previous expectations from the researchers as the real-time detection accuracy of pedestrians was around 88% and also the system was working smoothly overall. The system would overcome the current issues faced by people at the traffic signal points. Lastly, the report concluded with recommendations for further improvements to the developed system.

Keywords: Internet of things; Computer Vision; Optimised Traffic Control System

INTRODUCTION

Problem Statement:

One of the most pressing concerns confronting modern society is traffic congestion. Traffic flow optimization is critical for Sustainable Cities and Communities in order to reduce energy and economic waste. One of the issues observed at traffic light points is that many vehicles queue and wait for an extended period of time even when there are no more pedestrians to cross the zebra cross. This may appear to be a small concern now, but in the long run, vehicles queuing even when there are no more pedestrians to cross the zebra crossing would be a major concern because it would waste energy owing to the inefficiency of the current traffic signal control system.

Project Objectives:

- To develop a smart automated pedestrian traffic control system using deep learning, microcontrollers, cameras and lastly various sensors.
- To ensure the safety of pedestrians while crossing the road utilizing the automated traffic control system.
- To ensure real-time data collection from the traffic signals and make decisions based on it.
- To ensure the security of the automated pedestrian traffic control system from theft.
- To make the system self-sufficient, sustainable and cost-effective.

Innovation Motivation:

With more people moving to cities, there is a growing need for innovative transportation solutions that can accommodate the increasing volume of pedestrian traffic. The OptiTraffic pedestrian traffic control system can help optimize pedestrian flow and reduce congestion in urban areas, making it easier for people to get around and reducing the environmental impact of transportation.

INNOVATION DEVELOPMENT

OptiTraffic is a smart system that shall use deep learning, microcontrollers, pressure sensor and cameras to control the flow of the traffic light. To activate the system traffic light, the pedestrian must step on the pressure sensor and get detected by the camera. After giving the red signal to the vehicles and giving the green signal to the pedestrians, the pedestrians could cross the road easily. The system is equipped with an internal timer. During the green signal of the pedestrian traffic light, if there are more pedestrians trying to cross the road and they step on the pressure sensor, it will refresh the internal timer. If no pedestrians step on the pressure sensor for a designated time of the internal timer, the system will decide that there are no more pedestrians trying to cross the road and will immediately send the red signal to the pedestrians, giving the green signal back to the vehicle's traffic light. In this way, this mechanism will reduce pointless waiting time for vehicles and tackle traffic congestion.

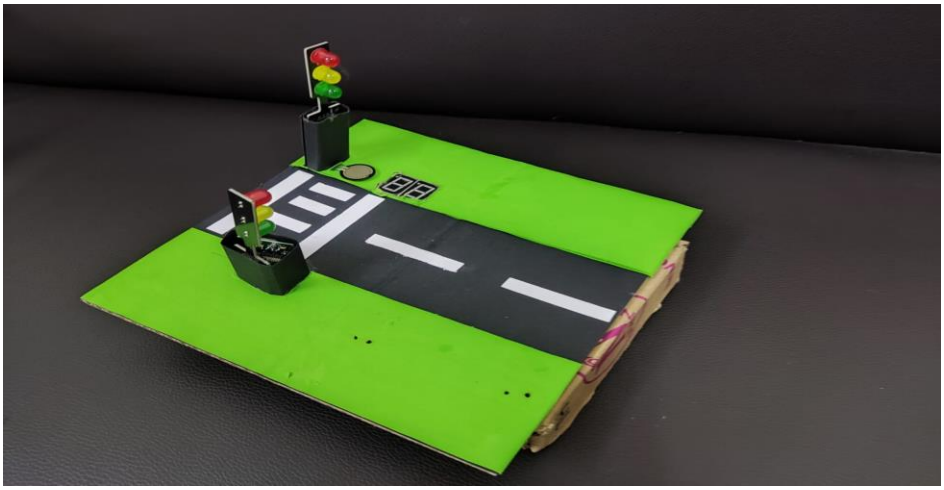


Figure 1: Final Prototype Image

LITERATURE REVIEW

Deep learning has been used by researchers to help manifest smart traffic. Deep learning opens up various methods of detection for researchers. One of the methods of detecting pedestrians and vehicles was to calculate the convex hull of each element and check and compare each pixel with its corresponding pixel. Each element is extracted as separate images. Finally, the Kalman filter is used to track and predict the movement of vehicles and pedestrians [1].

There is also a method where data from vehicles equipped with IoV (Internet of Vehicles) are assembled and analysed by deep learning techniques to predict and control traffic congestion [2]. By deploying the sensors at crucial junctions, the data could be streamed and traffic congestion could be predicted [3]. Another method of detection uses a predefined line to count the number of vehicles passing through each side of the road and control the duration of the traffic light based on the traffic load [4]. By using the YOLO algorithm, the detection system could also help to distinguish between normal vehicles and emergency vehicles such as ambulance cars and police cars [5]. The number of vehicles counted could also be used to predict the flow of the traffic for each intersection using deep learning. The traffic flow of the next period could also be predicted using past predictions as parameters [6].

Deep learning could also be used to detect traffic congestion by inputting parameters such as time, speed, temperature, wind, and weather to the neural network that was trained and predict the point of congestion. When the congestion point is found, the vehicles would then receive a message regarding the congestion point and recommend an alternate route [7].

The presence of pedestrians can be detected using weight measurements from pressure-sensitive curbside pads. They are less affected by the weather and other environmental factors compared to other kinds of sensors. Following the detection of the pedestrian, the presence of the pedestrian signal is a good solution for safety for warning the driver to slow down speed [8].

COMMERCIAL POTENTIAL

The invention of a traffic control system that optimizes pedestrian flow and reduces waiting times for vehicles has great relevance in addressing the problem of traffic congestion. As stated in the problem statement, traffic congestion is one of the most pressing concerns confronting modern society, and it has serious implications for energy consumption and economic waste. A more efficient traffic control system can help reduce congestion and improve the sustainability of cities and communities.

The problem statement also highlights the inefficiencies of the current traffic signal control system, which results in vehicles queuing even when there are no more pedestrians to cross the zebra crossing. This inefficiency can lead to unnecessary energy consumption and economic waste, and it can also contribute to frustration and inconvenience for drivers.

The invention of the OptiTraffic traffic control system optimizes pedestrian flow and reduces waiting times for vehicles can address these issues by improving the efficiency of traffic signal control. By using advanced technologies such as sensors, computer vision, and embedded systems, the system can detect and respond to changes in pedestrian traffic in real-time, allowing for more precise and efficient control of traffic signals. This can help reduce waiting times for vehicles and improve the overall flow of traffic, reducing energy consumption and

economic waste in the process.

The market needs and potential for the OptiTraffic traffic control system that optimizes pedestrian flow and reduces waiting times for vehicles are significant. The pedestrian traffic control system can provide economic benefits by improving mobility and reducing congestion, which can boost productivity and create cost savings for transportation providers and other businesses. It can also help reduce the cost of fuel and energy consumption, leading to economic benefits for the community as a whole. Reducing congestion and improving traffic flow can help reduce the environmental impact of transportation. The pedestrian traffic control system can help reduce greenhouse gas emissions by reducing idle times for vehicles and improving fuel efficiency.

Overall, the market potential for the OptiTraffic traffic control system that optimizes pedestrian flow and reduces waiting times for vehicles is significant. As cities and communities continue to grow and evolve, the demand for more efficient and sustainable transportation solutions will only increase, making this an exciting area for innovation and investment.

The innovation of the OptiTraffic smart pedestrian traffic control system provides an effective solution to the needs of pedestrians by reducing waiting times and increasing the overall efficiency of pedestrian flow. By incorporating advanced technologies such as sensors, computer vision, and embedded systems, the system can detect and respond to changes in pedestrian traffic in real-time, allowing for more precise and efficient control of traffic signals. The system can help reduce waiting times for pedestrians at crosswalks and intersections, making it easier and faster for them to get where they need to go. By optimizing pedestrian flow, the system can help reduce congestion and improve the overall flow of traffic, making it easier for pedestrians to navigate busy areas. By reducing congestion and improving traffic flow, the system can help reduce the environmental impact of transportation and contribute to a more sustainable future.

CONCLUSION

Overall, the developers implemented the smart traffic control system successfully. However, after developing the prototype, the developers realised that there are certain works which can be implemented in the future for better implementation of the prototype in real-life situations. Firstly, the microcontroller controlling the system shall be improvised in order to reduce the lag of data transfer between the system prototype and the data analysis dashboard of the system. Furthermore, in order to protect the camera from weather changes when applied in real-life conditions in the future, the developers decided to equip the camera with a case sealed with waterproof rubbers and fill the internals of the camera with silica gels. For the power supply, it is recommendable to increase the power by adding more batteries, especially using a lot of output devices. Moreover, in order to protect the pressure sensor from damage as it is required for the pressure sensor to be stepped on by potential pedestrians, the developers decided to install pressure snubbers or dampers between the process and the pressure instrument connection with different grades of porosity selection for protection of the pressure sensor.

As smart traffic control systems continue to evolve, there is a need for ongoing research and development. To guide future efforts in this area, the smart traffic control system developers proposed the following recommendations for potential researchers.

Pedestrian safety is an important concern on roads and highways, and there are several safety features in place to help protect pedestrians. One key safety feature is the Pedestrian crossing the road warning sign for the driver. This sign is a highly recognizable and standardized symbol that alerts drivers to the presence of pedestrians and to the possibility of a pedestrian crossing the road ahead. The sign is typically placed at locations where there are designated pedestrian crossings areas, such as crosswalks or intersections. It is designed to be highly visible and easily understood, with a simple graphic of a person walking and an arrow indicating the direction of travel.

The suggestion to add small LED or flashing lights in the ground beside traffic is aimed at improving pedestrian safety, particularly in situations where people may be distracted by their phones and unaware of their surroundings. The idea is to install these lights in strategic locations, such as at crosswalks or intersections, to create a visual cue for pedestrians to be more aware of their surroundings and potential hazards, such as oncoming traffic. The lights could be embedded into the pavement or ground and could be programmed to turn on automatically during certain times of the day or when a pedestrian is detected. The use of these lights could help to reduce the risk of accidents caused by distracted pedestrians who are not paying attention to traffic. By drawing their attention to potential hazards, the lights could encourage pedestrians to be more cautious and aware of their surroundings, reducing the likelihood of accidents or near-misses. Overall, adding small LED or flashing lights in the ground beside traffic is a creative and innovative solution to an increasingly common problem. By leveraging technology in this way, a safer and more secure environment for pedestrians would be created, while also promoting greater awareness and attentiveness on the part of both pedestrians and drivers.

The suggestion to implement automatic barriers at pedestrian crossings is aimed at improving pedestrian safety by preventing drivers, particularly motorcyclists, from running through red lights and endangering pedestrians. At present, some drivers, particularly those riding motorcycles, may ignore traffic lights and continue through red lights, even if pedestrians are present. This poses a serious risk to pedestrians, who may be hit by vehicles as they cross the road. Automatic barriers would work by blocking the road when the pedestrian crossing signal is activated, preventing any vehicles from passing through until the signal changes to allow traffic to proceed. The barriers could be operated automatically, based on sensors or timers that detect when the pedestrian crossing signal is activated. By implementing automatic barriers, a safer environment for pedestrians could be created by preventing drivers from running through red lights and endangering those on foot. This would also help to promote greater respect for traffic laws and regulations and encourage all road users to be more mindful of the safety of others. Overall, automatic barriers at pedestrian crossings represent a promising solution to a serious safety concern. By preventing reckless drivers from endangering pedestrians, a safer and more secure environment for everyone on the road could be created.

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REFERENCES

[1] Serrano, Á., Conde, C., Rodríguez-Aragón, L. J., Montes, R., & Cabello, E. (2005). Computer vision application: real time smart traffic light. In Computer Aided Systems Theory–EUROCAST 2005: 10th International Conference on Computer Aided Systems Theory, Las Palmas de Gran Canaria, Spain, February 7–11, 2005, Revised Selected Papers 10 (pp. 525-530). Springer Berlin Heidelberg.

[2] Saleem, M., Abbas, S., Ghazal, T. M., Khan, M. A., Sahawneh, N., & Ahmad, M. (2022). Smart cities: Fusion-based intelligent traffic congestion control system for vehicular networks using machine learning techniques. Egyptian Informatics Journal, 23(3), 417-426.

[3] Devi, S., & Neetha, T. (2017). Machine Learning based traffic congestion prediction in a IoT based Smart City. Int. Res. J. Eng. Technol, 4(5), 3442-3445.

[4] Sharma, M., Bansal, A., Kashyap, V., Goyal, P., & Sheikh, T. H. (2021). Intelligent traffic light control system based on traffic environment using deep learning. In IOP Conference Series: Materials Science and Engineering (Vol. 1022, No. 1, p. 012122). IOP Publishing.

[5] Faraj, M. A., & Boskany, N. W. (2020). Intelligent Traffic Congestion Control System using Machine Learning and Wireless Network. UHD Journal of Science and Technology, 4(2), 123-131.

[6] Navarro-Espinoza, A., López-Bonilla, O. R., García-Guerrero, E. E., Tlelo-Cuautle, E., López-Mancilla, D., Hernández-Mejía, C., & Inzunza-González, E. (2022). Traffic flow prediction for smart traffic lights using machine learning algorithms. Technologies, 10(1), 5.

[7] Ata, A., Khan, M. A., Abbas, S., Ahmad, G., & Fatima, A. (2019). Modelling smart road traffic congestion control system using machine learning techniques. Neural Network World, 29(2), 99-110.

[8] Czajewski, W., Dąbkowski, P., & Olszewski, P. (2013). Innovative solutions for improving safety at pedestrian crossings. Archives of Transport System Telematics, 6(2), 16-22.

Photosensitisation of Novel Ag_2CO_3/Nb_2O_5 Photocatalyst for EDCs Removal in Wastewater

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ABSTRACT

Ag-based semiconductor materials are currently catching the interest and research efforts of numerous material researchers due to their wide range of applications. This study aimed to examine the effect of incorporation of niobium pentoxide (Nb_2O_5) to the structural and morphological properties of silver carbonate (Ag_2CO_3), as well as the photocatalytic performance of the materials on EDCs, such as Bisphenol A (BPA). The preparation and evaluation on Ag_2CO_3, Nb_2O_5, and Ag_2CO_3/Nb_2O_5 composite were discussed in detailed. Ag_2CO_3, Nb_2O_5, and Ag_2CO_3/Nb_2O_5 composite were synthesized by facile precipitation method at room temperature and were characterised by Fourier Transform Infra-Red (FTIR) spectroscopy, and Field Emission Electron Microscopy (FESEM) for its structural and morphological properties. FTIR analysis revealed the emergence of CO_3^{2-}, C–O and Nb=O groups, as well as the development of bridging Nb–O–Nb in the composite structure. Morphological analysis revealed that Nb_2O_5 were irregular spherical-shaped and were evenly dispersed on the surface of irregular short rod structure of Ag_2CO_3. Moreover, this study provides a profound understanding towards the coupling system of Ag_2CO_3/Nb_2O_5 heterojunction. Lastly, the Ag_2CO_3/Nb_2O_5 composites has the potential to be directly and continuously applicable in a real-life event of industrial wastewater treatment on plastic manufacturing and epoxy resin industry.

Keywords: Silver carbonate; niobium pentoxide; Bisphenol A; visible light; EDCs

INTRODUCTION

A lot of chemical compounds are discharged into the aquatic system and posing a serious threat. Since conventional wastewater treatment are not intended to eliminate residues of hazardous organic pollutants like EDCs, these toxins end up in aquatic life and eventually enter the human food chain [1]. One of the commonly known EDCs is Bisphenol A, a common industrial chemical produced substantially around the world and commonly found in various plastic products [2]. Photocatalysis has gotten a lot of interest as a promising green technology that can degrade these pollutants into organic compounds [3][4]. Therefore, researchers are working on developing nontoxic, eco-friendly, low-cost, and efficient photocatalysts that can conduct reactions with large amounts of desired products under mild conditions [5]. Numerous studies

reported the used of Nb_2O_5 for photodegradation, yet, Nb_2O_5 photocatalysts is among the semiconductor photocatalysts that can only be driven by UV light that accounts for just ~5% of the solar spectrum's energy, whereas visible light accounts for 45% and [6][7]. Therefore, efforts should be undertaken to expand the light response of the photocatalyst from UV to visible light for efficient solar energy consumption and there are different kinds of heterojunctions formation on Ag-based photocatalyst with Nb_2O_5 have been developed for enhancing its photocatalytic capabilities [5]. Therefore, in this study we report to the best of our knowledge, on photosensitization of Ag_2CO_3-based photocatalyst through heterojunction of Ag_2CO_3/Nb_2O_5 composites.

INNOVATION DEVELOPMENT

1. Synthesis of Ag_2CO_3/Nb_2O_5 Photocatalyst

The Ag_2CO_3/Nb_2O_5 composite were prepared by facile chemical precipitation method. In this procedure, Nb_2O_5 (0.01 mol) was dispersed into the $AgNO_3$ (0.02 mol) solution prior to sonication for 30 minutes. Next, Na_2CO_3 (0.01 mol) was added with continuous stirring for 1 hour. The obtained precipitate was collected and washed with deionized water for several times before drying in the oven at 60°C. The pure Ag_2CO_3 was prepared likewise but without Nb_2O_5 and Ag_2CO_3/Nb_2O_5 composite with other molar ratios of Ag_2CO_3 to Nb_2O_5 (1:3,1:5, 3: 1 and 5:1) were synthesised similarly. The pure Nb_2O_5 was ground before being used.

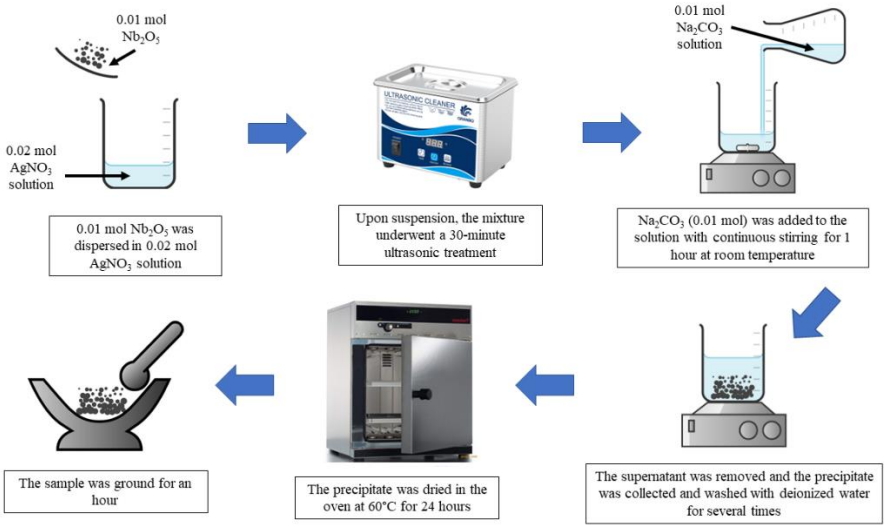


Figure 1: Sample preparation pure Ag_2CO_3, pure Nb_2O_5 and Ag:Nb composites at different molar ratios

2. Photocatalytic Activity Measurement

The photocatalytic performance of the samples was evaluated by measuring the degradation of BPA by UV-vis spectrophotometer in time intervals of 30 minutes. In all measurements, the samples (0.1 g) were put into BPA solution (200 mL, 10 mg/L), and irradiated with visible light, a 23-W fluorescence lamp (Philips). Before the suspensions were irradiated, they were magnetically stirred for 30 minutes in the dark to achieve the adsorption-desorption equilibrium between BPA and the photocatalysts. Before the spectroscopy measurement, these photocatalysts were removed from the photocatalytic reaction systems by filtration. The relative

concentrations of the BPA solutions were determined by the absorbance at 276 nm. The BPA percentage of degradation was calculated using Eq. (1).

$$Percentage\ degradation\ (\%D) = \frac{C_0 - C_t}{C_o}\ x100 \quad (1)$$

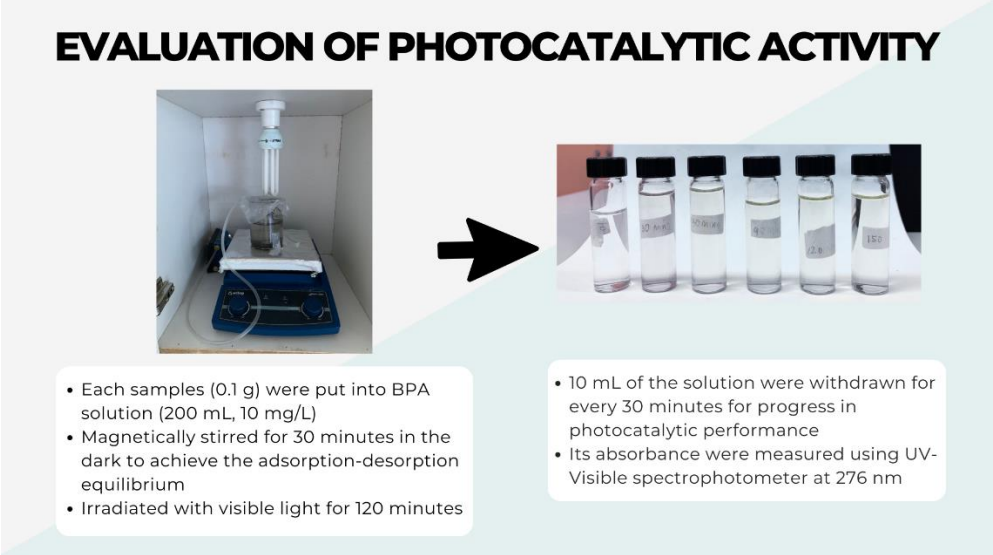
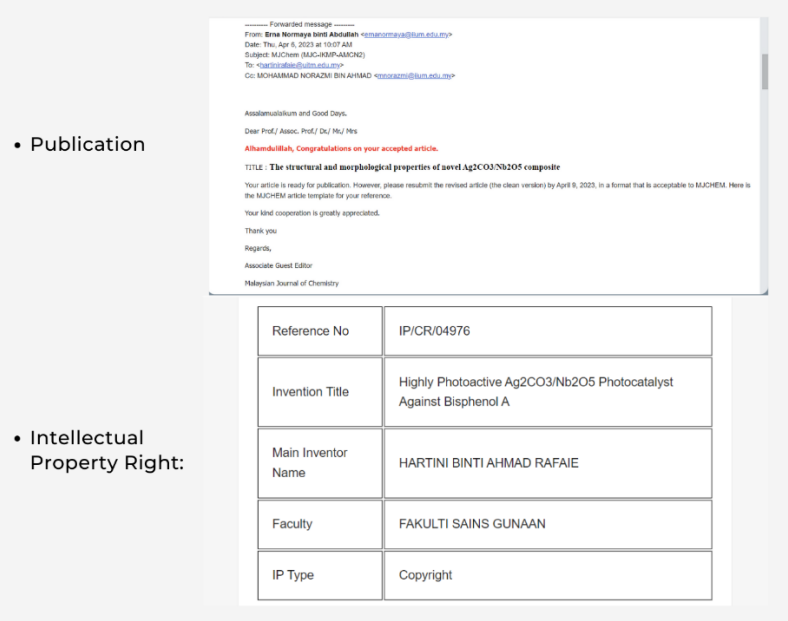


Figure 2: Photocatalytic activity measurement on EDCs by the prepared samples

COMMERCIAL POTENTIAL

The photocatalytic performance of Ag_2CO_3/Nb_2O_5 is hugely beneficial to investigate as it has the potential to be directly and continuously applicable in a real-life event of industrial wastewater treatment of plastic manufacturing and epoxy resin industry, especially towards the removal of toxic organic pollutants of EDCs, such as Bisphenol A. Furthermore, this research is also a significant strategy for a profound understanding towards the highly stable coupling system of Ag_2CO_3/Nb_2O_5 heterojunction. In addition, this research would provide a new semiconductor photocatalyst that will aid in towards cost-efficient wastewater treatment process due to the utilization of visible light irradiation that is more affordable compared to using the UV light irradiation that is costly. Figure 3 depicts the achievements of this project.



• Publication

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Assalamualaikum and Good Days.

Dear Prof./ Assoc. Prof./ Dr./ Mr./ Mrs

Alhamdulillah, Congratulations on your accepted article.

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Figure 3: Proof of the published work and related Intellectual Property Recognition (IPR)

CONCLUSION

To conclude, the Ag_2CO_3/Nb_2O_5 composite were successfully prepared with different molar ratios via a simple chemical precipitation method and exhibit irregular spherical-shaped that randomly dispersed on the surface of irregular short rod structure. The FTIR analysis pointed out the existence of several functional groups assigned to their respective stretching vibrations especially for Ag–O (~500cm^{-1}), C–O (1071 cm^{-1}), CO_3^{2-} (~800 cm^{-1} and 1350-1500 cm^{-1}), Nb–O–Nb (500-650 cm^{-1}) and Nb=O (948 cm^{-1}). Additionally, this study would be a key approach for gaining a thorough grasp of the morphological and structural characteristics on heterojunction coupling system of Ag_2CO_3/Nb_2O_5 composite. Lastly, the Ag_2CO_3/Nb_2O_5 composites has the potential to be directly and continuously applicable in a real-life event of industrial wastewater treatment on plastic manufacturing and epoxy resin industry.

ACKNOWLEDGEMENT

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REFERENCES

[1] D. Balabanič, M. Rupnik, and A. K. Klemenčič, "Negative impact of endocrine-disrupting compounds on human reproductive health," *Reprod. Fertil. Dev.*, vol. 23, no. 3, p. 403, 2011, doi: 10.1071/RD09300.

[2] R. Abo, N. A. Kummer, and B. J. Merkel, "Optimized photodegradation of Bisphenol A in water using ZnO, TiO2 and SnO2 photocatalysts under UV radiation as a decontamination procedure," *Drink. Water Eng. Sci.*, vol. 9, no. 2, pp. 27–35, Sep. 2016, doi: 10.5194/dwes-9-27-2016.

[3] L. Yin, Z. Wang, L. Lu, X. Wan, and H. Shi, "Universal degradation performance of a high-efficiency AgBr/Ag 2 CO 3 photocatalyst under visible light and an insight into the reaction mechanism," *New J. Chem.*, vol. 39, no. 6, pp. 4891–4900, 2015, doi: 10.1039/C5NJ00385G.

[4] M. F. M. A. Zamri, R. Bahru, F. Suja', A. H. Shamsuddin, S. K. Pramanik, and I. M. R. Fattah, "Treatment strategies for enhancing the removal of endocrine-disrupting chemicals in water and wastewater systems," *J. Water Process Eng.*, vol. 41, no. November 2020, p. 102017, 2021, doi: 10.1016/j.jwpe.2021.102017.

[5] K. Su, H. Liu, Z. Gao, P. Fornasiero, and F. Wang, "Nb2O5-Based Photocatalysts," *Adv. Sci.*, vol. 8, no. 8, pp. 1–25, 2021, doi: 10.1002/advs.202003156.

[6] C. L. and P. A. Raffaele Molinari, "Visible-Light Photocatalysts and Their Perspectives Various Liquid Phase Chemical Conversions," *Catalysts*, vol. 10, no. 11, 2020.

[7] H. Sudrajat, S. Babel, J. Phanthuwongpakdee, and T. K. Nguyen, "Local structure of iron oxide sensitizing Nb2O5 photocatalysts," *J. Alloys Compd.*, vol. 806, pp. 543–552, 2019, doi: 10.1016/j.jallcom.2019.07.206.

NanoRelief Gel: An Advanced Celecoxib Nanoemulgel for Effective Pain and Inflammation Relief

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ABSTRACT

Celecoxib (CXB) is a medication for the treatment of relieving pain and reducing inflammation in osteoarthritis and rheumatoid arthritis. It has low bioavailability when administered orally due to its lipophilic nature and low water solubility. Transdermal administration can allow targeted drug delivery without first-pass metabolism. However, it is difficult to get through the outermost layer of the skin due to the nature of the stratum corneum. To solve this issue, nanoemulsion (NE) serves as a vehicle for the delivery of various active pharmaceutical ingredients and has attracted great attention in the drug delivery field. One of our approaches is to modify NE into a new dosage form, which is nanoemulgel (NEG) for improved skin permeability. NanoRelief Gel is a topical gel that contains CXB as the active component. The gel's particle size of 149.07±1.42 nm demonstrates great permeability and therapeutic effects, with a narrow size distribution of 0.21±0.01 and good stability with the zeta potential value of -33.07±2.87 mV. NanoRelief gel provides effective alternative to traditional oral pain relief medications and can be site-specific, further enhancing its effectiveness. It has strong commercial potential value for arthritis patients due to its safety and effectiveness.

Keywords: Celecoxib; Fractionated medium chain triglycerides (FMCTs) oils; Nanoemulsion gel; Transdermal delivery; Pain and inflammation relief

INTRODUCTION

Celecoxib (CXB) is a nonsteroidal anti-inflammatory drug that belongs to Biopharmaceutics Classification System (BCS) Class II and has a low water solubility (4 mg/ml) due to its lipophilic properties. This restricts its oral use because of its inability to enter the gastrointestinal tract, resulting in poor bioavailability and inadequate absorption [1]. Transdermal delivery of CXB through the skin, on the other hand, provides advantages over oral delivery since it avoids hepatic first-pass metabolism and can be managed directly to specific sites of action, reducing the amount of drugs used and potential side effects [2].

The main problem for transdermal delivery is getting through the skin's outermost layer, which is challenging due to the stratum corneum's nature. According to research, nanosized topical formulations known as nanoemulsions (NE) with particle size ranging from 20 to 200 nm can improve drug permeability by disrupting the skin's lipid matrix [3]. However, because of its low viscosity, NE has a shorter contact time with the skin. To overcome this issue, gelling agents are combined with NE to form the NEG system, which has additional transdermal

applications and dual control releases. NEG also enhances colloidal stability and viscosity, resulting in improved treatment and therapeutic outcomes [4].

It has been suggested that NEG as an excellent carrier system for the delivery of lipophilic drugs [5]. Hence, the NanoRelief Gel was formulated as a solution to deliver lipophilic drugs like CXB to treat inflamed skin and pain in osteoarthritis and rheumatoid arthritis. The gel uses oil-in-water (O/W) NE systems and xanthan gum (XG) as a gelling agent, which is known to be a promising delivery system for lipophilic drugs. The components of the NE system, including fractionated medium chain triglycerides (FMCTs) oils namely medium chain triglycerides (MCTs) and palm kernel olein (PKOlein) oils and non-ionic surfactants, can effectively enhance drug permeation safely through the skin [6]. The gel's high viscosity, spreadability, thixotropic behavior, and easy removal make it an excellent transdermal drug delivery option [7].

INNOVATION DEVELOPMENT

NanoRelief Gel was formulated in three steps were involved as shown in Figure 1. First, a mixture of MCTs and PKOlein was used as the oil phase, and 1% of CXB was added to it. Then, mixed surfactants (Smix) of Tween 80 (T80) and Tween 85 (T85) in ratio 1:2 were added to the oil phase at room temperature. Deionized water was slowly added to this mixture in a dropwise manner, and it was homogenized for 30 minutes. Mixed oil phase and Smix of T80 and T85 were selected due to their high solubilizing potential for CXB as reported in our previous work [8]. Second, XG was added to deionized water to make a hydrogel base. Third, the hydrogel and NE system were mixed separately and then combined in a 1:1 ratio to form the final product, NanoRelief Gel, as shown in Figure 2.

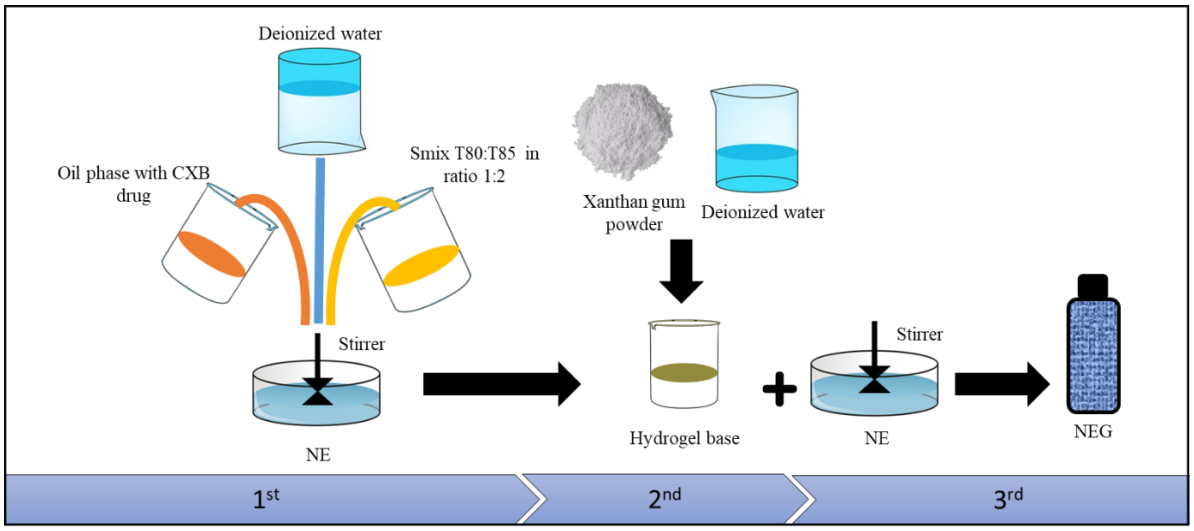


Figure 1: Innovation development of NanoRelief Gel.



Figure 2: Innovation prototype of NanoRelief Gel.

The particle size, polydispersity index (PDI), and zeta potential of both NanoRelief Gel and NE were then analysed (Figure 3). Results showed that both had a particle size of less than 200 nm (149.07±1.42 nm and 154.37±0.12 nm respectively) allows an effective penetration of the active ingredient CXB into the skin [9]. The PDI for both was less than 1.0 (0.21 and 0.22 respectively), indicating consistent and reliable product performance [10]. The zeta potential for both was less than -20 mV (-33.07±2.87 mV and -23.67±1.68 mV respectively), indicating that it is highly stabilized particles and an improved shelf life for the product (Figure 4).

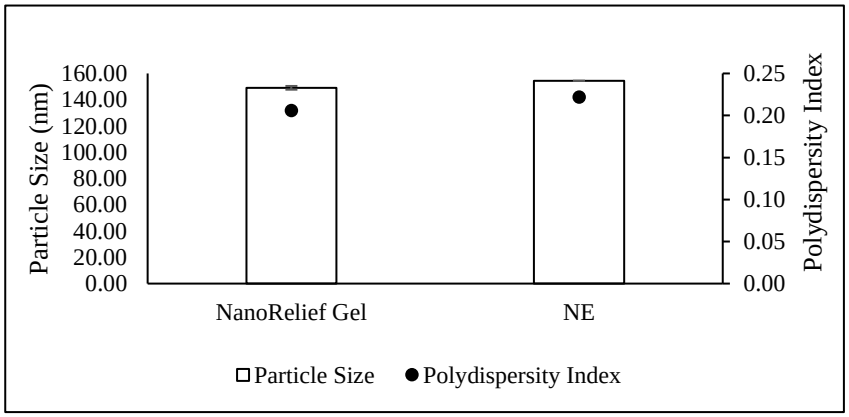


Figure 3: The particle size and polydispersity index (PDI) values between NanoRelief Gel and NE (n=3).

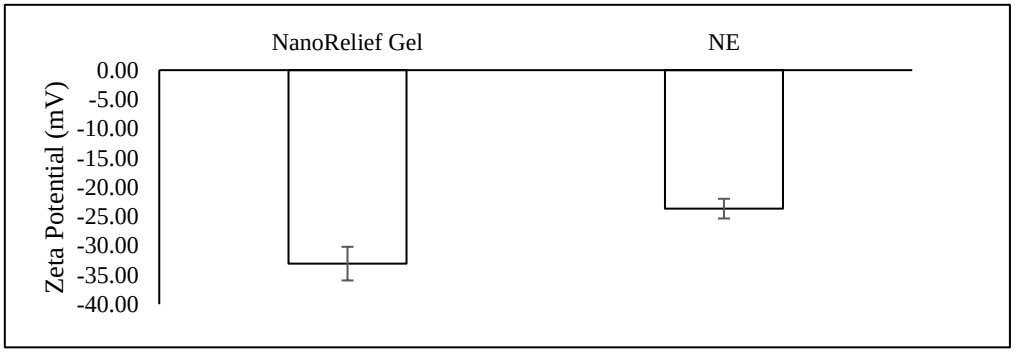


Figure 4: The zeta potential value between NanoRelief Gel and NE (n=3).

COMMERCIAL POTENTIAL

NanoRelief Gel is an innovative product that addresses the issues raised by conventional drug delivery systems. The stratum corneum layer of the skin forms a highly effective barrier, making transdermal drug delivery difficult and limiting the therapeutic potential of many topical formulations on the market. However, NanoRelief Gel can overcome this barrier due to its unique features, such as its small droplet size, which allows for better skin penetration. The gelling agent in the gel controls drug release, lowering the frequency of administration and the risk of overdose. NanoRelief Gel, unlike typical NE, is appropriate for transdermal delivery due to its improved viscosity and stability, allowing it to be retained on the skin surface for extended periods, sustaining drug release and improving drug absorption through the skin.

NanoRelief Gel contributes to new knowledge and technology by introducing an improved drug delivery system that combines the benefits of NE and hydrogel systems to improve drug stability, bioavailability, and therapeutic efficacy of CXB. This technology has revealed new insights into the role of NEG and the skin barrier in drug delivery without the need for chemical penetration enhancers, making it a safe and effective option.

NanoRelief Gel also offers a more environmentally sustainable product such as reducing the need for frequent dosing such as syringes, needles, and other medical waste, making it a viable choice for users seeking effective and safe transdermal drug administration. Also, it provides an alternative to parenteral drug delivery, which can be invasive and uncomfortable for patients. This could improve patient compliance and quality of life.

The O/W NE formulation's nanosized droplets improve therapeutic efficacy and reduce adverse effects by increasing the drug's surface area, which improves penetration and permeation through the skin. Instead of dangerous chemical penetration enhancers, NanoRelief Gel used harmless skin penetration enhancers such as FMCT oils and non-ionic surfactants. This makes NanoRelief Gel safer and more user-friendly solution for patients, particularly those with sensitive skin or chemical allergies. Thus, NanoRelief Gel offers several benefits that make it a promising solution for users in need of effective and safe transdermal drug delivery.

In terms of market needs, the global market for osteoarthritis treatments alone is expected to reach over $8.7 billion by 2027 [11]. This shows there is a growing demand for effective pain relief and anti-inflammatory treatments for osteoarthritis and rheumatoid arthritis patients. Thus, NanoRelief gel is well-positioned to address this market need, providing a safe and effective alternative to traditional oral pain relief medications that can have harmful side effects. As a result, there is a high market potential for this product as there is a growing demand for alternative routes of drug delivery that are safe, effective, and convenient.

CONCLUSION

In conclusion, the development of the NanoRelief Gel for transdermal drug delivery, offers a promising solution to the challenges of delivering drugs through the skin. Further studies could be conducted to evaluate the safety and toxicity of the NanoRelief Gel.

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REFERENCES

[1] Naeem, M., Iqbal, T., Nawaz, Z. & Hussain, S. (2021). Preparation, optimization and evaluation of transdermal therapeutic system of celecoxib to treat inflammation for treatment of rheumatoid arthritis. Anais da Academia Brasileira de Ciências, 93(e20201561). https://doi.org/10.1590/0001-3765202120201561.

[2] N'Da, D. D. (2014). Prodrug strategies for enhancing the percutaneous absorption of drugs. Molecules, 19(12), 20780–207807. https://doi.org/10.3390/molecules191220780.

[3] Iqbal, B., Ali, J. & Baboota, S. (2018). Recent advances and development in epidermal and dermal drug deposition enhancement technology. International Journal of Dermatology, 57(6), 646–660. https://doi.org/ 0.1111/ijd.13902.

[4] Sengupta, P., & Chatterjee, B. (2017). Potential and future scope of nanoemulgel formulation for topical delivery of lipophilic drugs. International Journal Pharmacy, 526(1–2), 353–365. http://dx.doi.org/10.1016/j.ijpharm.2017.04.068

[5] Bhardwaj, S. & Tiwari A. (2021). Nanoemulgel: a Promising Nanolipoidal-Emulsion Based Drug Delivery System in Managing Psoriasis. Dhaka University Journal of Pharmaceutical Sciences, 20(2), 235–246. https://doi.org/10.3329/dujps.v20i2.57174

[6] Som, I., Bhatia, K. & Yasir, M. (2012). Status of surfactants as penetration enhancers in transdermal drug delivery. Journal of Pharmacy and Bioallied Sciences, 4(1), 2–9. https://doi.org/10.4103/0975-7406.92724

[7] Choudhury, H., Gorain, B., Pandey, M., Chatterjee, L. A., Sengupta, P., Das, A., Molugulu, N. & Kesharwani, P. (2017). Recent Update on Nanoemulgel as Topical Drug Delivery System. Journal of Pharmaceutical Sciences, 106(7), 1736–1751. http://dx.doi.org/10.1016/j.xphs.2017.03.042

[8] Hairul, N. M., Ibrahim, S. I., Anuar, N. K., Salim, N. & Zulfakar, M. H. (2022). Celecoxib-Loaded Nanoemulsion: Solubility of Celecoxib in Various Fractionated Medium Chain Triglycerides Oils and Surfactants. In: Virtual 3rd International Research Network Initiative (IRNI) Symposium, Kuala Lumpur. Malaysian Journal of Medicine and Health Sciences, p. 77. Available from: https://isiswauitmedumy.sharepoint.com

[9] Sandri, G., Bonferoni, M. C., Ferrari, F., Rossi, S. & Caramella, C. M. (2014). The Role of Particle Size in Drug Release and Absorption. In: Merkus HG, Meesters GM (Eds.), Particle Technology Series, p. 323–41. https://doi.org/10.1007/978-3-319-00714-4_11

[10] Bashir, M., Ahmad, J., Asif, M., Khan, S. U. D., Irfan, M., Ibrahim, A. Y., Asghar, S., Khan, I., Iqbal, M., Haseeb, A., Khalid, S. & Abourehab, M. A. S. (2021). Nanoemulgel, an innovative carrier for diflunisal topical delivery with profound anti-inflammatory effect: In vitro and in vivo evaluation. International Journal of Nanomedicine, (16), 1457–1472. https://doi.org/10.2147/IJN.S294653

[11] Research and Markets. (2022). Global Osteoarthritis Therapeutics Market Outlook to 2026: A $11.2 Billion Market by 2026. Cision. Dublin. p. 133. Retrieved April 29, 2023. https://www.globenewswire.com/en/newsrelease/2022/02/22/2388970/28124/en/Global-Osteoarthritis-Therapeutics-Market-Report-2022-Knee-Osteoarthritis-Segment-is Forecast-to-Grow-from-5-9-billion-in-2021-to-9-billion-in-2026.html

CATEGORY C
Foundation/Matriculation

PECoF

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ABSTRACT

Our innovation product is focusing more on environmental problems which begin from carbon dioxide that is released by many sources. The rising carbon dioxide concentration in the air has a serious effect on human health as well as the surrounding environment. In addition, we also give full attention regarding the use of non-renewable sources as our country is currently dependent on them to generate power that can cause pollution to the environment and give adverse effects on human health. The objective of this innovation is to extract excessive carbon dioxide in the air and provide an alternative way to generate power by renewable source which is from the wind and sunlight. This innovation has two developments which are extracting carbon dioxide using Direct Air Capture (DAC) and generating power from natural sources. DAC involves a few stages which are sucking the air using the power generated, adsorption and desorption phase. Then, the second development is to generate power from natural sources that involve a turbine that will help to generate power by the wind produced from traffic speeding when vehicles pass by. The solar panel was installed to absorb sunlight and function to generate power. We believe this innovation has the potential to overcome the related problems as it has a unique invention from the combination of two functions (DAC and power generation by natural source) in one product. To conclude, this innovation could be the best way to bring the problems stated under control. Including an environmental monitor could be one of the consideration ideas to improve this innovation.

Keywords: Carbon dioxide; direct air capture; wind; sunlight; power

INTRODUCTION

According to United Nations, renewable energy can be defined as energy that derived from natural sources that are replenished at a higher rate than they are consumed. Natural resources are in limited supply regardless the high demand from around the world especially to power industrial society. Inspired from Devecitech's product of wind turbine, vertical axis wind turbine generates power from the wind produced by the vehicles and traffic speeding through the road.

Greenhouse gases function's is to absorb the sun's heat that radiates from the Earth's surface, trap it in the atmosphere and prevent it from escaping into space. It keeps the Earth warm than it would otherwise be, supporting life on Earth. Most of the greenhouse gases comes naturally in the atmosphere including carbon dioxide, water vapour, methane, and nitrous oxide. Human activities contribute to their accumulation resulting the planet's atmosphere getting altered, a rise in average temperature and more extreme climate events. One of the main greenhouse gases whose concentrations are rising is carbon dioxide. Carbon dioxide relatively nontoxic that appears as a colourless odourless gas in atmospheric temperatures and pressures.

PeCOf is a product that will extract carbon dioxide and extracted carbon dioxide will be reused to produce other relative carbon-product. PeCOf will help in carbon neutral where the carbon are not emitted and go to the cycle of being used and produced using the previous carbon and the cycle continues.

INNOVATION DEVELOPMENT

PeCOf mainly have two significant function which are to generate its own power from natural sources including sunlight and wind and to extract carbon dioxide to be reused and help in achieving carbon neutral.

First main function of PeCOf is extracting carbon dioxide by a process called Direct Air Capture (DAC). DAC is a technology used to remove carbon dioxide that already in our atmosphere. The captured carbon dioxide can be used again for food processing or combined with hydrogen to produce synthetic fuels that will help in carbon neutral and many more. The process will start when the fan generated by power sucks ambient air that consist of 0.04% carbon dioxide. The next stage will be followed by adsorption phase and desorption phase. For this process to be occurred, solid sorbent is chosen which is the amine solid sorbent which is a weak base. Solid sorbent chosen over liquid sorbent because it was at lower production scales, as they need lower regeneration temperatures and avoid evaporative solvent losses making solid sorbent much more convenient than liquid sorbent. The air that sucked by powered fan will go through the adsorbent where there will be adhesion of the carbon dioxide gas molecules to a solid surface of amine sorbent and will produce carbonate salt. Oxygen should be evacuated by vacuum pump before desorption process as oxygen will be exposed to amines with high temperature, which will degenerate and cannot be used in the future cycle. Next, desorption process followed where the absorbent will be heated by the steam with maximum temperature only will be 100 Celsius. Then, desorption phase will be next again to avoid the amine sorbent exposed to oxygen with high temperature. This process happened by cooling down the sorbent. Carbon dioxide extracted and the solid amine sorbent can be used again in the next cycle.

Second significant function of PeCOf is turbine that will help in generating power by traffic speeding produced by vehicles that passed by. Energy from sunlight will be absorbed by PV cells in the panel. The accumulation of electricity produced from both natural resources will be used to generate the system of Direct Air Capture.

COMMERCIAL POTENTIAL

The inventions that are implement in this product could be useful to address problem stated by using CAD system to extract excessive carbon dioxide in the air by undergo few steps which are sucking ambient air followed by adsorption phase and desorption phase for power generation, the solar panel, and the wind turbine installed could generate electricity. Thus, this proves the inventions of this innovation could bring the problems stated under control.

This innovation could give huge contributions to the new knowledge, technology, environment, and society. This innovation helps people to learn a new knowledge that is crucial for their future. Besides, this innovation also helps to give an idea to people in improving technology from this day forth. Environment condition also can be improving with this technology. Lastly, this technology can minimise the health problems on human as the carbon dioxide left is in adequate amount.

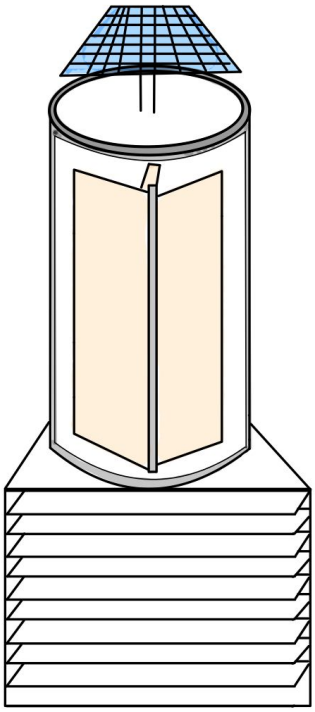


Figure 1: Innovation prototype

Table 1: PECoF price perunit

	Capital Cost (S-DAC)	Operation Cost (S-DAC)	Material Cost
	Adsorbent: RM 4406.97	Adsorption: RM 19.18	Solar Panel: RM 3000
	Blower: RM 61.11	Steam: RM 191.80	PECof body: RM 15000
	Vacuum pump: RM 77.61	Vacuum Pump: RM 1.34	Wind turbine Blade: RM 500
	Condenser: RM 1.78		
	Contactor: RM 37.37		
Total	RM 4584.94	RM 212.32	RM 18500.00
Price per unit	RM 23500.00		

CONCLUSION

Several issues related to this project are this product required large amount of energy and also very expensive. In PecoF, large turbine or fan is used to drive the air to through the part of DAC that contains material to capture carbon dioxide. These large turbines required large amount of energy to fully function. Furthermore, high energy input is necessary to produce material for DAC processes. Besides large amounts of energy, this product also quite expensive. Currently, there are very few markets that willing to use DAC to capture

carbon dioxide as it required a lot of energy not only to operate itself but the part of the DAC is also hard to produced and required full energy to function properly. For example, the sorbent material used to capture the carbon dioxide. However, this might change in the future because we cannot predict how this DAC change in the future. If this DAC concept is used widely in the future, the cost might change.

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REFERENCES

[1] Mihrimah, O., Saswat, P., Anthony, D. & Wenmei, J. Current status and pillars of direct air capture technologies. Department of Electrical and Computer Engineering, University of California Riverside. https://doi.org/10.1016/j.isci.2022.103990
[2] Yang, Q., Lamers, P., Vassilis, D., McQueen, N., Boer, H., Mathijs, H. Wilcox, J., Bardow, A. & Sangwon, S. Environmental trade-offs of direct air capture technologies in climate change mitigation toward 2100, 1-3. https://doi.org/10.1038/s41467-022-31146-1
[3] Klaus, S. & Habib, A. Buying down the cost of direct air capture. Industrial & Engineering Chemistry Research. https://doi.org/10.1021/acs.iecr.0c04839
[4] McDonagh, S. Turning traffic into clean energy: How this startup plans to power the streets of Istanbul. Euronews Green. https://www.euronews.com/green/2021/11/04/turning-traffic-into-clean-energy-how-this-startup-plans-to-power-the-streets-of-istanbul
[5] Ugur, S. Financial payback analysis of small wind turbines for a smart home application in Istanbul Turkey. Renewable Energy Research and Application. https://www.researchgate.net/publication/322634694_Financial_Payback Analysis_of_Small_Wind_Turbines_for_a_Smart_Home_Application in_Istanbul Turkey
[6] Soheil, S., Valentina, B. & Massimo, T. Future prospect of direct air capture technologies: Insight from an expert elicitation survey. European Institute on Economics and the Environment. 10.3389/fclim.2021.630893
[7] Ahmed, S., Yasser, A, Brahim, A., Arash, O., Nashaat, N., Mutfah, E. & Abdulkarem Amhamed. A review on progress made in direct air capture of CO2. Environmental Teavhnology & Innovation. https://doi.org/10.1016/j.eti.2022.102991
[8] Elfvung, J. Bajamundi, C. & Juho, K. Characterization and performance of direct air capture sorbent. Science Direct. https://doi.org/10.1016/j.egypro.2017.03.1746

The Solarluxe Torchlight

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ABSTRACT

The solar torchlight innovation aims to provide sustainable and reliable lighting solutions to communities with limited access to electricity. The innovation employs solar panels to absorb and convert solar energy into electrical energy, which is stored in rechargeable batteries that power light sources. The solar torchlight innovation represents a promising solution to address the challenges of energy poverty and climate change. Moreover, addition with many features like compass and bulb as lighter make it a multi-purpose torchlight. The purpose of this innovation is to implement new ideas to bring about positive change and improve efficiency, effectiveness, and competitiveness to the community since there are many complaints about flashlights nowadays like the lack of feature and reliability of the torchlight. The analysis study also can see their criticisms regarding torchlight nowadays performance by users make up 75% of the reported complaints which are LED failure, water leakage, the batteries no longer keeping the charge as they initially had, and the switch failing. Thus, we explore the concept of innovation torchlight, SOLARLUXE and its vital role in shaping the modern world. By highlighting successful examples of innovation, we demonstrate how the torchlight of innovation can drive organizations towards growth and success. Overall, the innovation torchlight represents a beacon of hope for organizations looking to stay relevant and competitive in a rapidly changing world.

Keywords: Torchlight; solar; multi-purpose

INTRODUCTION

Solar torchlight is a lighting device that uses solar energy to generate power and illuminate its surroundings. It works by charging a rechargeable battery during the day through its solar panel and using that stored energy to provide light at night. Solar torchlight is an eco-friendly and cost-effective alternative to traditional torchlights that require disposable batteries or electricity. Solar torchlight is an ideal for outdoor activities, camping trips, emergencies, climbing activities, and for everyday use in area with limited access to electricity.

The problem statements that lead us to do the innovation for the torchlight are because in increasing number of cases regarding to death or missing, and other ill-fated incidents encountered by climbers in recent years. Next, the most common incident in climbing activities is getting lost while hiking and last but least, some climbers die because of unpreparedness, not bringing the right equipment and inexperience. Hence, this torchlight has been improved with something new to reduce various risks of human activity during the day or night.

INNOVATION DEVELOPMENT

Torchlights are commonly used by people who like extreme activities such as camping. However, the torchlights that are sold in the market have quite limited functions and do not meet the customer's taste in terms of comfort or durability. Regarding these circumstances, we came up with the SOLARLUXE idea, which is a multipurpose torchlight that can make everyone's life easier.

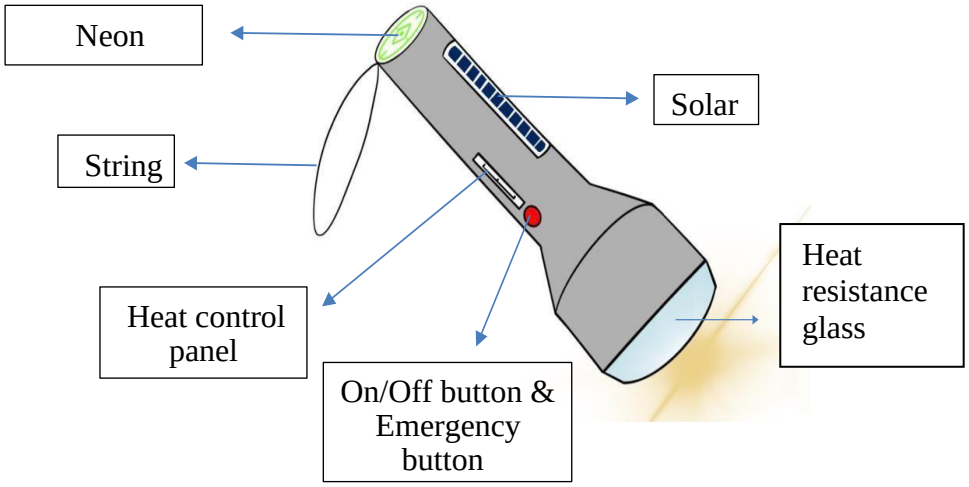


Figure 1

In our innovation, we have collected some information about creating new products. This flashlight has a variety of special features that can compete with the torchlights sold on the market, including the fact that it is charged using solar energy. By using solar energy, we can save non-renewable energy and maintain the sustainability of the environment. Next, it is also equipped with a neon compass that helps climbers determine the exact direction to reach their destination. They do not have to worry about carrying a lot of things when doing mountain climbing expeditions. It has been mentioned that this multi-purpose torchlight has two functions which it can be used as a light source outdoors and also act as a lighter. Therefore, it is equipped with heat-resistant glass that aims to keep users safe from being exposed to hot heat. If they want to light a fire using the lighter, they need to open the heat-resistant glass and bring the torchlight closer to the material to be burned. The users only need to control the light intensity of this torchlight by adjusting the heat control panel. Moreover, it is also equipped with an emergency light that can help users with any problems that occur. They only need to press the "on/off" button twice to turn on the emergency lights. Finally, we also added a string to make it easier for users to carry this lamp.

COMMERCIAL POTENTIAL

A SOLARLUXE torchlight with commercial potential could have innovative features such as long-lasting battery life, brightness control, and a durable design, making it an attractive and reliable option for consumers in various settings such as camping, hiking, or emergency situations.

The precise features and intended application of a torchlight would determine its target market. For instance, if the torchlight is intended for outdoor pursuits like camping or hiking, the target market would be outdoor enthusiasts who place a premium on equipment's dependability, brightness, and longevity. If the torchlight is designed to be used in emergencies, potential customers could include homeowners, emergency personnel, and those who live in locations that frequently have power outages. The target market might also be influenced by additional criteria like price point and brand repute. In order to maximise the torchlight's potential for commercial success, the target market should coincide with its intended purpose and distinctive qualities.

CONCLUSION

In conclusion, we can use our knowledge that we learned to applied in our daily use. We also managed to achieve our objectives which are can evaluate the effectiveness of innovation product that can be used by the public, to foster a culture of innovation and continuous improvement, while also promoting collaboration and teamwork among team members and to develop practical, actionable recommendation that can be implied to drive growth. Some improvement that we can do in the future is we can add cute compass to help hikers find way out. We hope that by using our product, we can reduce many accidents especially for hikers.

ACKNOWLEDGEMENT

First and foremost, we would like to express our gratitude towards The Almighty, Allah SWT for allowing us to successfully finish this project without encountering any major obstacles. Next, we would like to give thanks to Sir Helmy, our lecturer for his unwavering support, direction, and encouragement in this project. All the support and guidance which really help and matter most to achieve completion of this project. May our flying colour results be enough to pay back for all of his guidance. I could not have made this journey without the rich knowledge and experience my defence committee supplied. Moreover, our group members consist of Fatin Khadijah, Ainul Qistina, Fatin Aini, and Batrisyia deserve many thanks as we have pooled in energy into completing this project. Although it was challenging, we managed to finish this during the time given. To conclude, without the assistance of each person who has been described above, we could not have completed this project successfully.

REFERENCES

[1] Wiktionary (n.d.). http://www.peli.com.my/lightingproduct/flashlights/safety-approved-light/stealthlite-2410-led-torchlight-detail
[2] Ashok, S. (n.d.). *Solar energy | Definition, Uses, Advantages, & Facts*. Britannica. Retrieved May 19, 2023, from https://www.britannica.com/science/solar-energy
[3] *Everything You Need To Know About Torches | RS*. (n.d.). RS Components. Retrieved May 19, 2023, from https://uk.rs-online.com/web/content/discovery/ideas-and-advice/torches-guide
[4] *Heat Resistant Glass, Fire Rated Glass*. (n.d.). One Day Glass. Retrieved May 19, 2023, from https://www.onedayglass.com/types-of-glass/heat-resistant-glass/
[5] Sharma, A. (n.d.). *Make Your Own LED Bulb Replacement for Regular Torchlight*. Instructables. Retrieved May 19, 2023, from https://www.instructables.com/Make-your-own-LED-bulbreplacement-for-regular-tor/

[6] *Top 5 Best Handheld Torch & Flashlights - Expert Reviews*. (n.d.). Camping Things. Retrieved May 19, 2023, from https://www.campingthings.com/best-handheld-torch-flashlights/.

[7] *Types of compasses and their features*. (2022, May 1). Get Outside Ordnance Survey. Retrieved May 19, 2023, from https://getoutside.ordnancesurvey.co.uk/guides/beginners-guide-to-thecompass/

[8] Yong, M. (2022, May 12). *9 Best Torch Lights in Malaysia 2023 - LED, rechargeable & more*. Product Nation. Retrieved May 19, 2023, from https://productnation.co/my/19130/best-torchflash-light-malaysia/

Epididymitis: A Silent Male Issue

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ABSTRACT

Epididymitis is an inflammation of the coiled tube, called the epididymis, at the testicals. It functions to store and carry sperm. Epididymitis caused by bacterial infection like sexually transmitted infections (STIs). About 1 in 1000 men develop epididymitis annually, and acute epididymitis accounts for more than 600,000 medical visits per year. However, this disease is underdiagnosed since not all sufferers, even the health practitioner, are well aware of it. The objective of this study is to develop innovative education videos of epididymitis to create awareness among men especially the youngsters. The five minutes video includes informative content such as the causes, symptoms, and complication of epididymitis that we are acting in the video. YouTube was used as a platform to share this video to the public. A google form was used to get the feedback on the awareness of the viewers about epididymitis. 50 respondents were successfully recruited in the study. The outcome reported none of them was familiar with this disease. This shows that it is a critical task and concern to create public awareness of this disease among the young generation. It is thus promising for the early diagnosis of the disease with appropriate treatment management, and reduces its risk among men such as fertility.

Keywords: Epididymitis; epididymis; disease; awareness

INTRODUCTION

Most of the men including children in this world does not aware that they have the tendency to have such a disease to their private part [4]. Majority of the society only know the women's disease such as breast cancer which is well known openly discuss among our people but for male private part disease like epididymitis and varicocele, it rarely mentioned and concern. The things that we all face is that the level of knowledge of society about these diseases are critically bad. Hence, some innovation about how to overcome this problem is necessary to improve knowledge of the public about the diseases.

Firstly, Epididymitis is an inflammation of the coiled tube, called the epididymis, at the testicals. It functions to store and carry sperm. Epididymitis caused by bacterial infection like sexually transmitted infections (STIs) [6]. Its symptoms are swollen, discoloured or warm scrotum, testicle pain and tenderness, and blood in the semen [1]. This condition occurs when urine flows backward into the epididymis, causing chemical irritation [7]. Other than that, epididymitis also has the infection. Fever, hematuria, dysuria, and urine frequency may also occur concurrently, and the discomfort may spread into the lower abdomen [3]. Bacteria from a urinary tract or prostate infection might spread from the infected site to the epididymis and it also may have tuberculosis infection [1].

Next, varicocele is the side effect of epididymitis. A varicocele is an enlargement of the veins within the loose bag of skin that holds the testicles (scrotum) [2]. This varicocele may have a symptom such as infertility. A varicocele may lead to difficulty fathering a child, differently sized testicles, and has a mass in the scrotum [2]. Based on our research the exact cause of a varicocele is unknown [2]. One contributing factor may be the malfunction of valves inside the veins that are intended to keep blood moving in the right direction [2].

INNOVATION DEVELOPMENT

The innovation is the video for society about the diseases. The objective of this study is to develop innovative education video of epididymitis to create awareness among men especially the youngsters. The innovation motivation of this project is we include informative content such as the causes, symptoms, and complication of epididymitis. The details about these diseases will discuss further in our report below.

To spread the awareness among the public, we produced a video that explain about the Epididymitis that include symptoms, causes, infections, and complications of this disease. To create this video, we gained a lot of information about Epididymitis from Google, Lecturers, and medical graduate. Before start making the video, the data obtained is discussed to find out whether it was accurate or not.

Once the video is ready, we upload the video into our YouTube channel for public viewing. Then, we also made a survey by using Google Form platform. We also inserted the YouTube video into this Google form for respondents to watch. Next, some questions are also prepared to test the respondent's level of understanding of epididymitis before and after watching the video that has been prepared. We shared the survey by using the social media platforms such as WhatsApp and Telegram. We share the video to people like our friends and family members. Last but not least, we gathered the information from the responses of the respondents.



Figure 1: Various sharing platform

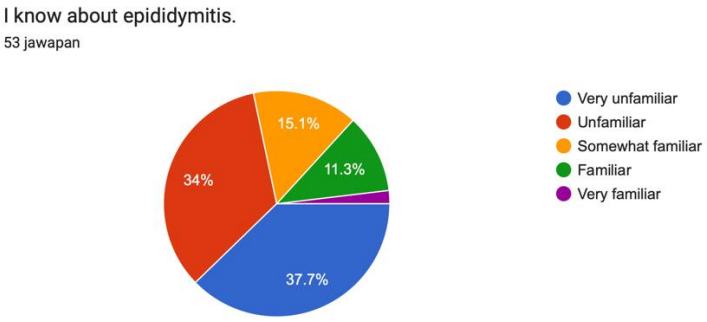


Figure 2: Before informational video

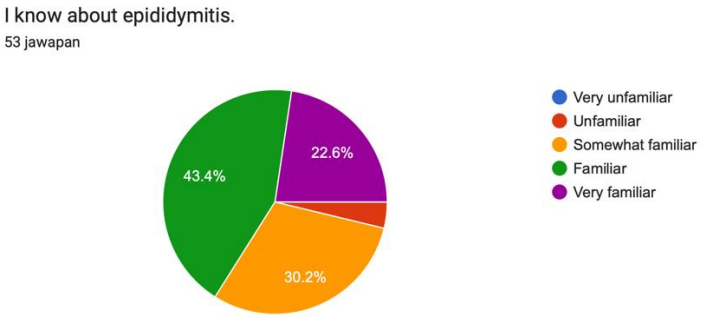


Figure 3: After informational video

COMMERCIAL POTENTIAL

Everyone does not want to hear something that has been not confirmed by professional or a person who has experienced it. Before the video was produced, it is important to get to know about the diseases from the correct sources. We found people who had win against this disease and they voluntarily want to share their life story. We also manage to contact with Puan Nur Hanani Binti Abbas which is a nurse from University Malaya Medical Centre (PPUM) to state the facts about these diseases among society and explains more about these diseases. The online interview has been done using Google Meet platform.

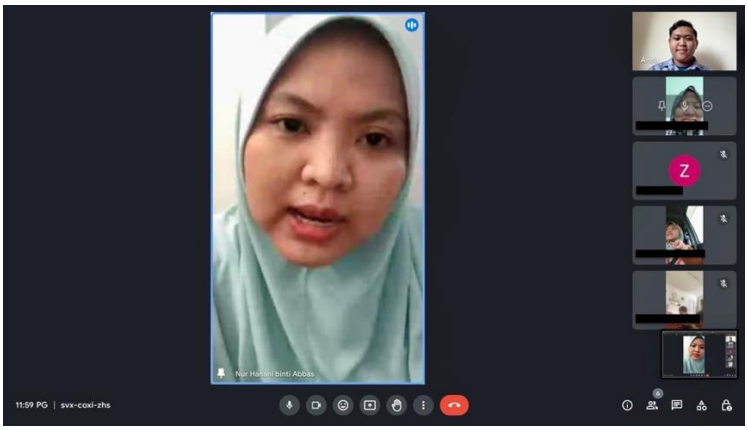


Figure 4: Interview done using google meet.

Lots of information from the interview have been used to make our products which is the video and flyers. We decided to use this method because it is to kill two birds with one stone. Firstly, all the people get the exposure about the existence of these diseases by showing them the video that contain about the prevalence, factors and symptoms of the diseases. This will give people more understanding how their reproductive organs works and they become more aware about their private part health. Secondly, individuals acquire their advised healthy lifestyle from flyers to avoid having this health issue, but the most important aspect is that they are aware that they must constantly keep cleanliness of their private parts in order to prevent cancer from occurring [5].



Figure 5: An individual get explanation about the health problem.

CONCLUSION

To conclude, epididymitis is a disease that affect a lot of men all around the world but the awareness about this disease is still very low among the society. Therefore, this disease was chosen as the topic to spread awareness and share information about epididymitis. Five minutes video of information of epididymitis including symptoms, causes, infections, and complications of this disease was made and shared on YouTube. Next, a survey was made using Google form and was shared to our friends and family members to test their level of understanding of epididymitis before and after watching our video. From the survey, the majority of the respondents' level of understanding of epididymitis increased after watching the video. They are more familiar and aware of the disease.

ACKNOWLEDGMENT

Bismillahirrahmanirrahim, first and foremost praise and thanks to The Almighty God, Allah S.W.T and His messenger, Muhammad S.A.W for His showers of blessings throughout our research process to complete the project successfully.

We would like to acknowledge and give our warmest thanks to our lecturer, Mdm. Tengku Norbaya Binti Tengku Azhar who gave us the golden opportunity to do this wonderful project. Her advice and guidance truly helped us to complete this project without any flaws, not to mention her patience, motivation and immense knowledge guided us in all the time of research.

Last but not least, our special thanks to the higher ups of Universiti Teknologi Mara, Kampus Dengkil for giving us chances to enroll in this university as well as leading towards this meaningful project.

After doing many discussions together, we have decided to spread awareness about male private part diseases that many did not know about it. This is due to lack of early exposure of their private part during their childhood phase. Children need to have a good early education so that they have knowledge about their own private part.

REFERENCES

[1] Mayo Clinic. (2019). *Epididymitis - Symptoms and causes*. Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/epididymitis/symptoms-causes/syc-20363853

[2] Mayo Clinic. (2022, March 3). *Varicocele - Symptoms and causes*. Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/varicocele/symptoms-causes/syc-20378771#:~:text=A%20varicocele%20(VAR%2Dih%2D

[3] McCONAGHY, J. R., & Panchal, B. (2016). Epididymitis: An Overview. American Family Physician, 94(9), 723–726. https://www.aafp.org/pubs/afp/issues/2016/1101/p723.html

[4] Tracy, C. R., Steers, W. D., & Costabile, R. (2008). Diagnosis and Management of Epididymitis. Urologic Clinics of North America, 35(1), 101–108. https://doi.org/10.1016/j.ucl.2007.09.013

[5] Tracy, C. R., Steers, W. D., & Costabile, R. (2008). Diagnosis and Management of Epididymitis. Urologic Clinics of North America, 35(1), 101–108. https://doi.org/10.1016/j.ucl.2007.09.013

[6] Louette, A., Krahn, J., Caine, V., Ha, S., Lau, T. T. Y., & Singh, A. E. (2018). Treatment of Acute Epididymitis. Sexually Transmitted Diseases, 45(12), e104–e108. https://doi.org/10.1097/olq.0000000000000901

[7] Michel, V., Pilatz, A., Hedger, M. P., & Meinhardt, A. (2015). Epididymitis: revelations at the convergence of clinical and basic sciences. Asian Journal of Andrology, 17(5), 756–763. https://doi.org/10.4103/1008-682X.155770

Communication Campaigns on Cardiovascular Disease Awareness: A Case Study among Youngsters in Malaysia

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ABSTRACT

Cardiovascular disease (CVD) is a major public health concern in Malaysia, with increasing prevalence and mortality rates in recent years. While CVD has traditionally been viewed as a disease of older adults, recent studies have shown that youth in Malaysia are also at risk. Additionally, a study on coronary artery disease (CAD) among Malaysian youth found that almost 70 per cent of participants aged 15 to 24 have at least one cardiovascular risk factor. Besides, in the 2018 survey, the prevalence of self-reported CVD was 5.8%, which increased to 6.7% in the 2020 survey. This represents a significant increase in just three years. This campaign aims to provide a comprehensive overview of the current state of knowledge regarding CVD among youth in Malaysia. On the other hand, spreading awareness to the youth by using posters are popular and effective method for health campaigns due to their ability to convey information in a visually appealing and accessible manner. In fact, three posters that comprise current news, symptoms, factor risk, treatment, labelled heart structure and a family tree of genetic inheritance disease will be used throughout this campaign. On top of that, flashcards will be used as they provide a quick and effective way to communicate important health messages to audiences. Overall, the use of posters and flashcards in the health campaign was successful in promoting healthy eating habits and physical activity among school-aged children in the rural community. The campaign demonstrated that simple and visually appealing tools can be effective in raising awareness about health issues and promoting positive behaviour change among youth.

Keywords: Youngsters; awareness; posters; flashcards; healthy

INTRODUCTION

Cardiovascular diseases (CVD) are a type of disease that affects the heart or blood vessels. According to the Department of Statistics Malaysia, Ischemic heart disease continued to be the leading cause of mortality, accounting for 17.0% of the 109,155 deaths that were medically verified in 2020 [Statistics, 2021].

The problem arises when most of Malaysian youngsters are living in unhealthy lifestyle and were unaware of their cardiac condition. The living environment in urban areas is worse compared to rural areas are the massive contributor on this issue. This is due to the living costs, dietary habits, and higher stress level [Amiri M., Majid, H.A] In fact, the deficiencies in CVD knowledge among youngsters is also one of the factors for this issue.

Health awareness campaign regarding heart health is designed to educate the public, especially youngsters, about cardiac diseases. Three posters that explain about the insight of heart disease including factors, symptoms, treatments for cardiovascular diseases and current news related to cardiovascular disease.

INNOVATION DEVELOPMENT

The effectiveness of awareness programmes is significantly influenced by the general public's degree of illness knowledge of heart disease in Malaysia. In order to educate the public about the heart disease, one of the best methods is by doing a campaign to spread awareness among teenagers in Malaysia. Next, the data was obtained by distributing the google form among the youngsters in Malaysia. By doing this, the number of respondents among youngsters who are well informed about this disease can be determined.

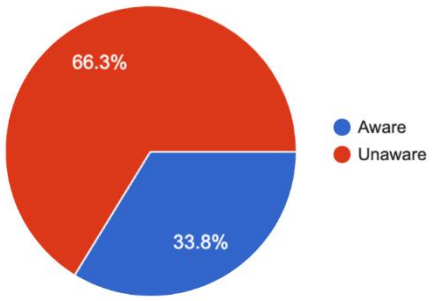


Figure 1

Based on the pie chart, it is proven that most of youngsters in Malaysia has zero knowledge about cardiovascular diseases. This is because 66.3 % vote for no in each question about cardiovascular disease meanwhile only 33.8 % vote for yes in each question in the google form. Thus, this campaign can spread awareness so that many youngsters can take early prevention about it as saying goes “Prevention is better than cure.”



Figure 2

Based on Figure 2, this campaign has detailed all the information about heart disease that occur in youngsters including factors, consequences, treatments for cardiovascular diseases, heart structure and current news related to cardiovascular diseases. By doing this, teenagers in Malaysia will be well informed about cardiovascular disease.

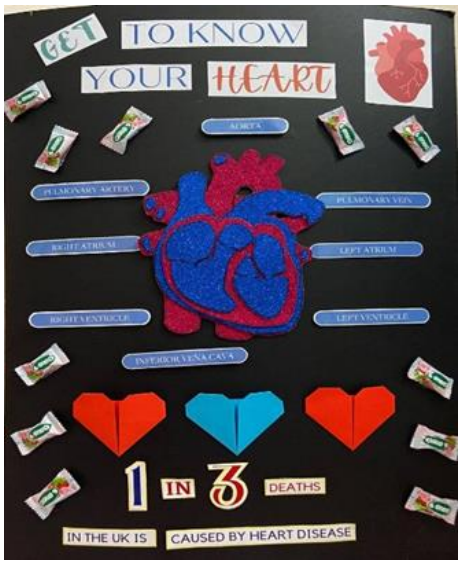


Figure 3

Based on figure 3, a diagram of heart's structure with three blank parts is prepared for the audience to fill it during the campaign. In the meantime, audience will be briefed on how our heart is functioning daily. The objective of this activity is to make sure that the audience are aware of the vital organ in their body.



Figure 4

Based on Figure 4, it shows the genetic family tree cardiovascular disease diagram. By projecting this diagram, the audience will be able to identify their family member that has diagnosed with cardiovascular diseases. Audience also can take an early prevention if one of their family members has been diagnosed with these diseases.



Figure 5

Based on figure 5, this campaign has come up with bunch of flashcards about prevention of CVD as one of the tools for this campaign. Therefore, the audience can reinforce their understanding towards the importance of the prevention on cardiovascular disease in their life. By using flashcard, the audience can be more engaged and enjoyable to learn about the cardiovascular disease as the flashcard making it easier for the brain to interpret it. Flashcards is the best tools for this campaign because it is colourful and can attract the audience attention to stay focus during this campaign.

COMMERCIAL POTENTIAL

The number of youngsters who was diagnosed in cardiovascular disease increase rapidly every year in Malaysia and the youngsters in Malaysia are unaware of their heart condition due to several factors. From this health awareness campaign, it will contribute $ increasing awareness of CVD in society. By improving the awareness among the youngsters about cardiovascular disease, it will give the new knowledge to them as it may lead early recognition of CVD symptoms and their risk factors of this disease. The youngsters will also be aware of the importance on regular checks even if they are healthy and will start to take care of their heart by practising healthy lifestyle. Other than that, we have prepared a few examples of treatments for cardiovascular disease, one of the treatments is echocardiogram. Due to the advanced technology in this era, this disease can be cured more efficiently than usual. This health awareness campaign also will make the society wants to participate more in public education campaign that focuses on awareness of heart diseases in Malaysia as they realized it is important for them to take care of their heart condition. Our main goal that we hope that we can achieve on this campaign is to increase the awareness of cardiovascular disease especially among the teenagers in Malaysia due to the rising number of young people that has been diagnosed with the bad condition of heart in each year.

CONCLUSION

From this awareness campaign, the prevalence of cardiovascular diseases can be reduced. Along with education level, targeted educational interventions among young people in the population can help spread information about cardiovascular emergency treatment and have a substantial impact on the survival of persons with these disorders. Early intervention through awareness and educational programmers may be an alternative for addressing these issues at their root cause.

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We would like to express my sincere gratitude and appreciation to all those who have contributed to the success of this project. Special thanks to my supervisor/mentor for their guidance, expertise, and support throughout this journey. I am also grateful to my colleagues and team members for their valuable insights and assistance. Finally, I would like to acknowledge the funding/support received from [insert funding/support organization], which made this project possible. Thank you all for your unwavering support and encouragement.

REFERENCES

[1] CodeBlue. (2022) Age Is Just A Number: Malaysian Millennials And Gen Z At Risk of Heart Disease, 2022. https://codeblue.galencentre.org/2022/08/19/age-is-just-a-number-malaysian-millennials-and-gen-z-at-risk-of-heart-disease/

[2] Azmi (2014). Research Gate, Public Knowledge and Awareness of Cardiovascular Diseases and the Expected Role of Community Pharmacists in the Prevention and Management of Cardiovascular Diseases in Penang, Malaysia. http://dx.doi.org/10.12982/CMUJNS.2014.0041

[3] Hazreen (2015). BMC Public Health, Prevalence and determinants of cardiovascular disease risk factors among the residents of urban community housing projects in Malaysia, https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-14-S3-S3

[4] CVS (2022). CVS Public Health, Heart Disease in Malaysia. https://www.cvskl.com/heart-disease-in-malaysia/

[5] World Health Organization (2021). CVD. https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

[6] Olvera (2022). National Library of Medicine CV.D. https://www.ncbi.nlm.nih.gov/books/NBK535419/

Development of Epilepsy Action Plan: An Innovation of Disease Management

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ABSTRACT

Epilepsy is a chronic non-communicable disease which interferes with the brain cell that affects people of all ages. It causes frequent seizures and starts at any age but usually in childhood and people over 60. It is often lifelong, but sometimes gets better over time. Epilepsy sufferers experience hurdles with their quality of life (QOL) and sometimes face problems due to unexpected seizure episodes in public. People with epilepsy often do not receive appropriate care from their surroundings, which often results in their illness remaining untreated, affecting both their physical and psychological health. The objective of this study is to design a campaign to raise awareness of epilepsy on how it can be well managed as it is highly treatable. Besides, it can increase the public's knowledge, especially the caretaker of this neurological condition which affects nearly 50 million people worldwide. This epilepsy campaign was designed using an informative and attractive video that has information about the emergency treatment and post action care to overcome seizure. In this video, the first aid training demonstration to prepare everyone when they are facing emergency situations that involve epilepsy was presented. The feedback gained from 50 viewers of the video reported that about half of the respondents are aware of epilepsy but are not aware of how to handle it. All in all, this campaign has successfully made the community understand and realize the importance of treating and helping epilepsy patients when needed does increase the interest of the public to know more about these diseases.

Keywords: Epilepsy; disease; management; campaign

INTRODUCTION

Epilepsy is a common neurological disorder that affects the brain and causes recurring seizures. Seizures are bursts of electrical activity in the brain that temporarily affect how it works. People over 65 years of age have the highest incidence of epilepsy of any age, accounting for almost a quarter of cases of new onset epilepsy. Many people with epilepsy have more than one type of seizure and may have other symptoms of neurological problems as well. Having seizures and epilepsy can affect your safety, relationships, work, driving, and so much more [1]. Public misunderstanding and treatment of people with epilepsy are often bigger problems than actual seizures [2].

Thus, in this workpaper, we are focusing on methods and precautions that can eventually be done in order to manage epilepsy from prolonged duration and to reduce the chances of developing epilepsy. This includes physical and emotional support from close friends or family members, where they will comfort and give advice to the epilepsy sufferer. For example,

something soft should be put behind them for better comfort and prevent others from crowding near the sufferer [3]. This is crucial for them to feel better and prevent them from unnecessary stress that might worsen the epilepsy [4]. This is because prolonged epilepsy may lead to death [5, 6]. So, an innovation developement of epilepsy management is made to raise awareness to public about this serious health issues.

INNOVATION DEVELOPMENT

In order to raise awareness of epilepsy among the community, we decided to create an informative and attractive video. The purpose of this video is to give information about emergency treatment and post action care to overcome seizure. In this video, we explained the overview of epilepsy as people might not be familiar with this disease. We also explained about symptoms and causes for this disease so that people will be aware of this condition. However, the aim of this video is to give knowledge to the community about emergency treatment when they face this situation. We make a first aid training demonstration in this video to help people to know how to handle this emergency situation as most of us usually rely on the expert to treat them when actually we can do it by ourselves.

After the video is ready, we upload it into our Youtube channel under the name of our leader, Amirah Rushdi. We also made a survey using Google form and distributed the form to society through social media such as Whatsapp. In this google form, we also put our video link to enable the respondent to access and watch the video easily. Some questions were asked in this google form to test the understanding of respondent towards epilepsy.Lastly, we gathered the information and data obtained from the respondents.

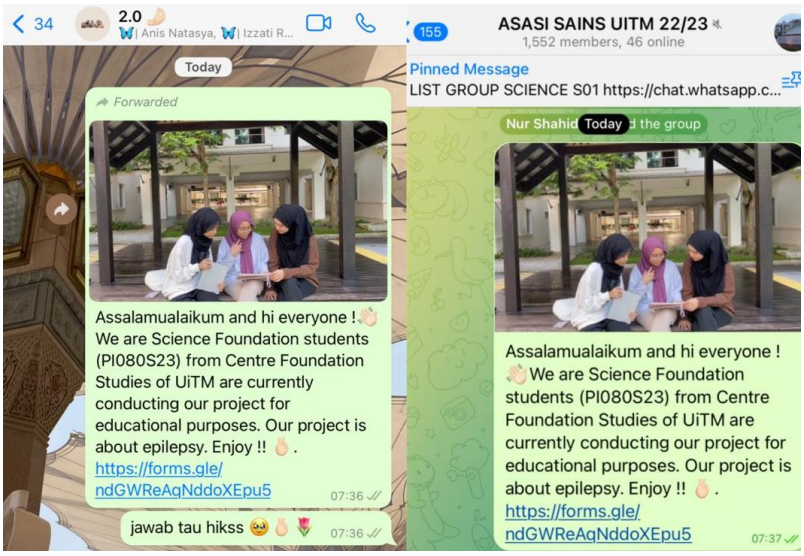


Figure 1: Sharing platform.

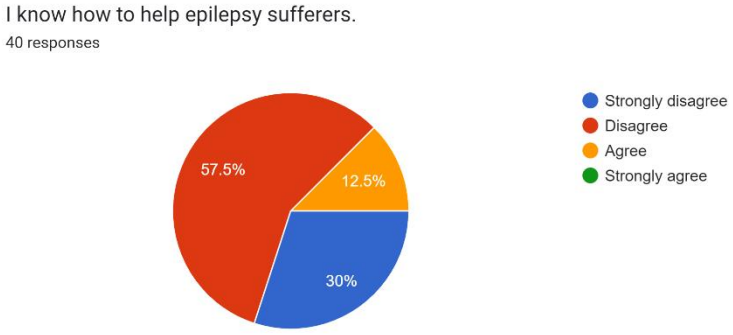


Figure 2: Before watching the video.

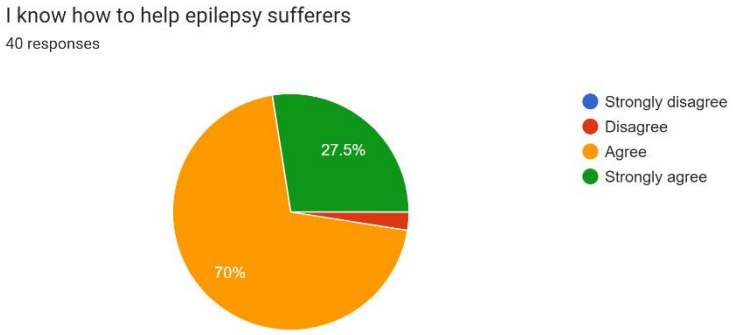


Figure 3: After watching the video

COMMERCIAL POTENTIAL

Epilepsy is a chronic noncommunicable disease of the brain that affects people of all ages. In our society, some of us may be aware of this disease and some may not. To make sure that what we are going to share with the public is correct, we interviewed Muhammad Nazirul bin Ahmad Husni, a final year student at USMKLE in India. From the interview, Dr. Nazirul mentioned that the cause of this disease is checked by blood investigation, complete blood count (CBC), glucose level, serum electrolyte, MRI, and CT scan. If all are normal, then the doctors will proceed to do Electroencephalogram (EEG). Because epilepsy varies, the diagnosis requires tests, history, and clinical examination. This way, we can see that accurate diagnosis of seizure type and where seizures begin are crucial for finding an effective treatment. In our project, we are focusing on the treatment of the disease and giving first aid to those who have an epilepsy attack. In short, our video can help to raise awareness in the community. This is because we believe that not many people know how to give first aid to a person with epilepsy attack [7].

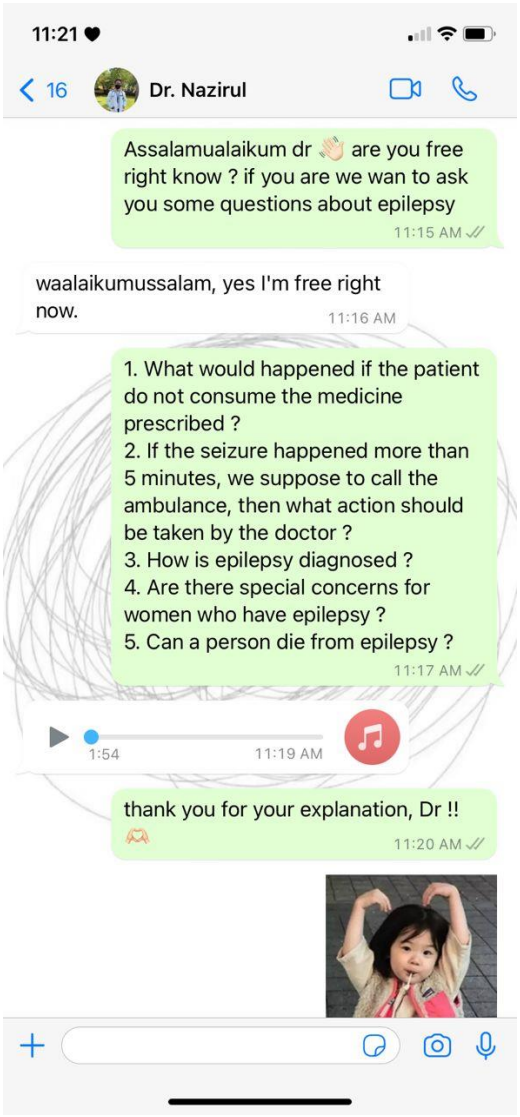


Figure 4: Interview with Dr. Nazirul via WhatsApp.

From our video, the public can understand more clearly about epilepsy treatment and first aid. This way, those who have an epilepsy attack can be rescued. It is very important to do a correct first aid because epileptic patients can be threatened to death when someone gives a wrong first aid and treatment to them. Nowadays, there are already some technologies that are being created for epileptic patients. For instance, Embrace2 is FDA-cleared wrist-worn wearable for epilepsy [8]. Since there is no cure for this disease, future generations can do more research and make more technological inventions and innovations for people with epilepsy to use. We believe that this may be one of the positive feedback from our video.



Figure 5: An epileptic patient wearing Embrace2.

CONCLUSION

To sum up, this awareness campaign on epilepsy has been successful in spreading essential facts on epilepsy to the society. This five-minutes video that has been uploaded on Youtube have been able to educate people on the strategies and techniques to minimize seizure duration, its causes, symptoms and misconceptions on epilepsy to create more accepting society for people with epilepsy. This video also highlighted some treatment done by the health educators if seizures happen for more than five minutes and additional knowledge on the nature of epilepsy in our video. A survey also was made to test the understanding of respondent towards epilepsy. There are many other methods on raising awareness on epilepsy and it is very important continue to improve the strategies to ensure it reaches the public from time-to-time over generations. In the future, steps that could be done to raise awareness is by collaboration with healthcare professionals and organizations that are in charge in achieving this goal. In addition, people that are diagnosed with epilepsy themselves can be invited to talk about their experiences and provide more knowledge and advice to the individuals who have recently been diagnosed. All in all, by working together with continued efforts to educate people on epilepsy, it can create more supportive environment with people who suffered and encourage early diagnosis and treatment.

ACKNOWLEDGEMENT

Bismillahirrahmanirrahim, first and foremost praise and thanks to The Almighty God, Allah S.W.T and His messenger, Muhammad S.A.W for His showers of blessings throughout our research process to complete the project successfully.

We would like to express special appreciation and thanks to our mentor, Dr. Tengku Norbaya binti Tengku Azhar from University Teknologi Mara, Dengkil, she has been a tremendous mentor for us. Her advice on both videos and research on our project have been invaluable and truly helped us to complete this project without any flaws, not to mention her patience, motivation and immense dedication guided us in all time of our research. Her dynamism, vision and sincerity have deeply inspired us. She taught us the methodology to carry out the project as clear as possible. It was a great privilege and honour to work under her guidance.

Last but not least, our special thanks to the higher ups of Universiti Teknologi Mara, Kampus Dengkil for giving us chances to enrol in this university as well as leading towards this meaningful project.

After doing many discussions together, we have decided to spread awareness on how epilepsy can be well managed as it is highly treatable. Besides, it can increase public's knowledge especially the caretaker of this neurological condition which affecting nearly 50 million people worldwide.

REFERENCES

[1] Weixi Kang, Antonio (2023). Personality functioning in current epilepsy patients and people recovered from epilepsy. https:10.3390/reports6020021
[2] Herm J Lamberink et al. (2020). Seizure outcome and use of antiepileptic drugs after epilepsy surgery according to histopathological diagnosis. https://www.researchgate.net/publication/344994071_Seizure_outcome_and_use_of_antiepileptic_drugs_after_epilepsy_surgery_according_to_histopathological_diagnosis_a_retrospective_multicentre_cohort_study
[3] Matthew Hoffman, MD. (2023). What to do when someone has a seizure. https://www.webmd.com/epilepsy/epilepsy-seizure-what-to-do-in-an-emergency
[4] Weifeng Peng, Jing D., Shaokang Z. & Xin Wang (2021). A survey on doctors' cognition of depression in patient with epilepsy. https://10.1002/brb3.2232
[5] Ali Asadi, Razieh Shafaei, Maryam Abdolrezaee, & S Mohammad Ali (2023). Opinions about epilepsy surgery in adults with epilepsy. https://10.1016/j.yebeh.2023.109176
[6] Matthew Hoffman, MD. (2023). What to do when someone has a seizure. https://www.webmd.com/epilepsy/epilepsy-seizure-what-to-do-in-an-emergency
[7] Abbasi Kangevari, M., Kolahi, A. A., Farsar, A. R., & Kermaniranjbar, S. (2019). Public Awareness, Attitudes, and First-Aid Measures on Epilepsy in Tehran. Iranian journal of child neurology, 13(1), 91–106.
[8] Empatica. (2023). Embrace2. https://www.empatica.com/embrace2/

SMATBOX-9000

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ABSTRACT

Nowadays, carrying keys and storing items with a conventional lock has been a cliché method and there has been a problem with people intruding with their lock pick skills. Ergo, the safety of items in a safe box would be reduced to nil. Plus, the budget for buying a safety box made out of steel to ensure durability and lost-lasting would be pricey for some users. The involvement of RFID technology is the main component that is used as a security measurement. A specific card or tagging with an Identification embedded with the RFID scanner would be the key to unlocking the locker. The body of a lock box as a storage space would be made of different kinds of wood with different prices as it is custom-made. With a custom setting where the user can pick different sizes of boxes and types of wood used it would be much easier for them to set a budget from low to high price. The targeted audience would be school authorities for keeping documents and the general public. To conclude, the combination of RFID technology and craftsmanship could help add the conveniences for customers to buy an ideal safety box to store their belongings.

Keywords: Safety, budget, RFID, custom-made, conveniences

INTRODUCTION

The functionality of RFID card consists of a variety of use throughout the use of human technology. A simple and obvious technology would be the toll station using RFID technology such as touch N Go and Smart Tag. The main function for the RFID tech concept that has been used in our project is to command the movement of servo motor to unlock the locker attached to a wooden box and there will be a delay time of 10 second for it to restart back to the initial position of the locker. An RFID system uses radio waves. The tag's proximity to the reader triggers the system compared to magnetic stripe card, an RFID smart cards don't need to make physical contact with reader, which adds convenience when you are carrying an armload of boxes and want access to a locked room. The data on a RFID card is only readable when you have special equipment, this feature keeps the data recorded on the chip secure. The objective basically to build a lock system that use RFID tech that can only access to a specific RFID tag to unlock the locker connected to the wooden box.

INNOVATION DEVELOPMENT

SMATBOX 9000 main innovation components are RFID module connected to Arduino Nano and RFID tag to build a strong security mechanism. The RFID scanner is connected via jumper wire with Arduino Nano and later connected to the PC to save instruction from the programming language.

CODING

```
#include <Servo.h>
#include <SPI.h>
#include <RFID.h>

RFID rfid(10, 9);

byte kart[5] = {70,127,198,250,5};
Servo myservo;
boolean card;

Void setup()
{

Serial.begin(9600);
SPI.begin();
rfid.init();
myservo.attach(3);
myservo.write(100);

}
```

```
Void loo()
{

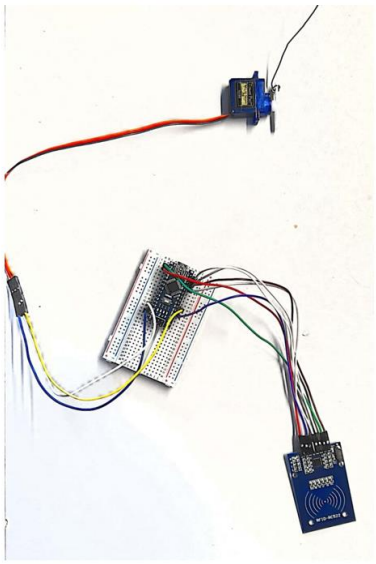
 if (rfid.isCard())
 {

  if(rfid.readCarddSerial())
  {
   Serial.print("Found ID: ");
   Serial.print(rfid.serNum[0]);
   Serial.print(",");
   Serial.print(rfid.serNum[1]);
   Serial.print(",");
   Serial.print(rfid.serNum[2]);
   Serial.print(",");
   Serial.print(rfid.serNum[3]);
   Serial.print(",");
   Serial.println(rfid.serNum[4]);
  }
  for (int l = 1; l < 5; i++)
  {
     if (rfid.serNum[0] == kart[0] && rfid.serNum[1] == kart[1] && rfid.serNum[2] == kart[2] && rfid.serNum[3] == kart[3] &&
rfid.serNum[4] == kart[4])
      {
       card = true;
      }
       else{
         card = false;
      }
    }
    if (card == true)
    {
     Serial.println("Correct Card");
     myservo.write(20);
     delay(500);
     myservo.write(100);
    }
    else
    {
     Serial.println("Wrong Card");

    }
    rfid.halt();
  }
}
```

Figure 1: Coding based on Arduino.IDE

Assamble circuit (Picture)



Wiring connection

D3>servo motor
5V>servo motor
Gnd>servo motor
3.3Vnano >3.3vRfid
RstRfid > D9Gnd
rfid > gndnano
Misorfid > D12
Mosirfid > D11
SCKrfid > D13
Sdarifd > D10

Figure 2: Assembly circuit

COMMERCIAL POTENTIAL

RFID technology has been contributing to this modern society, mainly from tolls and scanner to gain access to public transport. Hence, the technology used can be implemented with a safe box as the security is solid and strong where it can only detect a specific card or tagging that has an ID that already encoded in the system of a lock.

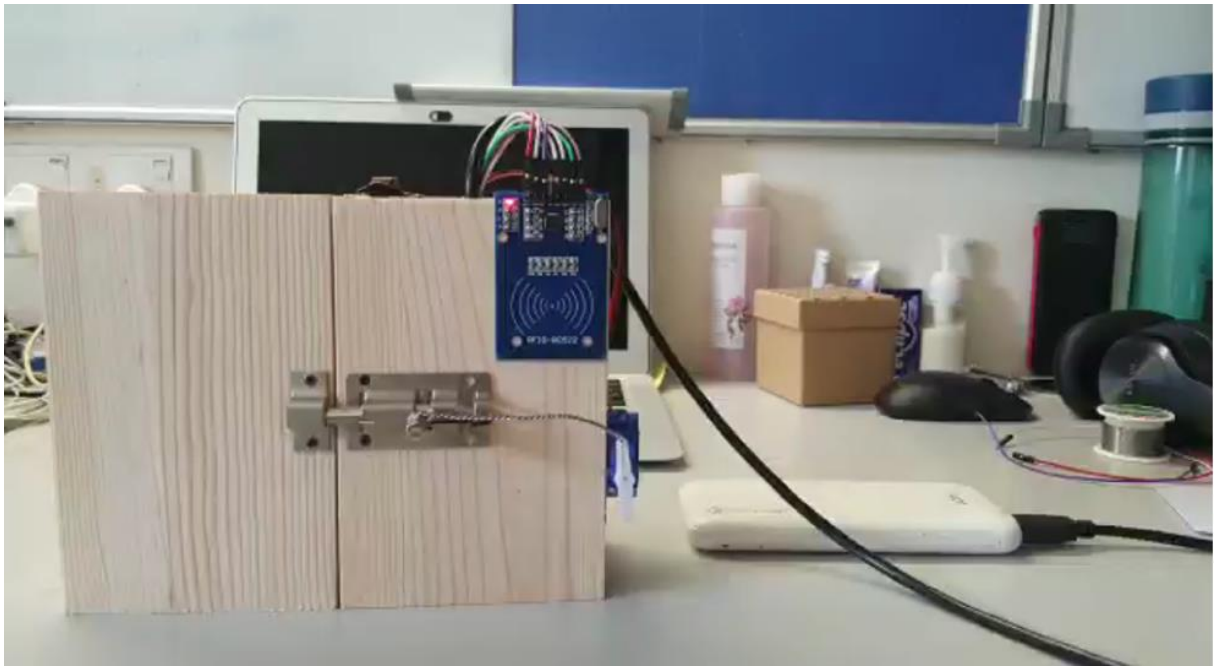


Figure 3: Innovation prototype SMATBOX 9000

Table 1: Product Cost

Item	Quantity	Price (Rm)
Arduino uno	1	48.00
Breadboard	1	2.00
Servo motor	1	6.00
RFID Module	1	12.00
Wire jumpers	10	2.00
Wooden Box	1	10.00
	TOTAL	80.00

Selling price = (Total cost x 40%) + Total cost
= 40+80
= RM120

CONCLUSION

SMATBOX 9000 is one product that useful for keeping our belongings safe. This product automatically lock and unlock by using RFID tag compare with normal save box. Normal save box is time consuming to lock and unlock it so by this product it save users time. Other than that, this product also will avoid problem of forgetting password or code by using normal save box because of this product just using an id to detect for unlock it. Finally, SMATBOX 9000 are also automatically lock after several seconds to make sure that save box in the safe condition.

ACKNOWLEDGEMENT

The teams behind the creation of SMATBOX 9000 would like to thank our lecturer Miss Wan Adibah Hanis for assisting us on our project and Madam Najwa Rawaida for sharing us on the events to compete with other innovation teams.

A special thanks to UiTM Kampus Dengkil for providing a conducive environment for the team to build a fully functioning SMATBOX 9000 within one month.

REFERENCES

[1] YouTube. (2020, September 11). *How to make a RFID door lock using Arduino Nano*. YouTube. Retrieved April 30, 2023, from https://www.youtube.com/watch?v=hHwWNP2Is6o

[2] Amsler, S., & Shea, S. (2021). RFID (radio frequency identification). *IoT Agenda*. https://www.techtarget.com/iotagenda/definition/RFID-radio-frequency-identification

[3] Kemény, Z., & Ilie-Zudor, E. (2016b). Alphanumerical and Optical Coding Systems for Food Traceability. In *Elsevier eBooks* (pp. 49–65). Elsevier BV. https://doi.org/10.1016/b978-0-08-100310-7.00004-1

[4] *What is an Arduino? - SparkFun Learn*. (n.d.). https://learn.sparkfun.com/tutorials/what-is-an-arduino/all

[5] Agarwal, T. (2019b, June 24). *Arduino Nano Board: Features, Pinout, Differences and Its Applications*. ElProCus - Electronic Projects for Engineering Students. https://www.elprocus.com/an-overview-of-arduino-nano-board/

[6] *The Purpose of Servo Motors | Fuji Electric Product Column | Fuji Electric Global*. (n.d.). https://www.fujielectric.com/products/column/servo/servo_01.html

[7] Agarwal, T. (2019, June 24). *Arduino Nano Board: Features, pinout, differences and its applications*. ElProCus. Retrieved May 7, 2023, from https://www.elprocus.com/an-overview-of-arduino-nano-board/

[8] Wirz, M. (2022, March 22). *Types of Arduino boards – quick comparison on specification and features*. Different Types of Arduino Boards - Quick Comparison on Specification & Features. Retrieved May 7, 2023, from https://circuitdigest.com/article/different-types-of-arduino-boards#:~:text=Arduino%20Nano%20is%20a%20small,the%20USB%2DTTL%20converter%20chip.

Power Exercycle

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ABSTRACT

Most people usually do indoor fitness activities while using a smartphone. When their smartphone battery is running out, they have to find a charger and a plug that may be far from their exercise equipment and they can no longer use the smartphone in order to charge the smartphone battery. As such, we designed exercise equipment, a stationary exercise bicycle named Power Exercycle with its own uniqueness. This product's specialty is that it can generate electricity to recharge smartphone batteries by converting mechanical energy from pedalling into electrical energy. Hence, people can save electricity and use their smartphones while exercising despite a low smartphone battery. The special features of this product are it has a phone holder and a cable to recharge the smartphone beside a digital display screen. This product can have a high commercial potential as people, especially adults that are busy exercising will enjoy and get benefit from this 2 in 1 product. Therefore, the Power Exercycle can provide a lot of benefits for the users in order to maintain body fitness and at the same time save electricity.

Keywords: Power exercycle; smartphone battery; converting energy; generate electricity; save electricity

INTRODUCTION

In the modern era, people spend most of their time using electronic devices such as computers, television, and smartphones which may increase the usage of electricity. The use of electronic devices has many benefits but at the same time, it also causes many problems such as humans becoming increasingly lazy to do healthy activities such as exercise which is necessary for good health and healthy life [1]. In addition, some people choose to exercise while using electronic devices such as jogging while listening to music. However, long-term use of electronic devices will cause the device to run out of battery. This will affect the exercise activity of the individuals as it is likely that they will stop exercising to find a place to connect their electronic device to charge it which they cannot use the electronic device while exercising.

As for that, we designed a product named Power Exercycle that enables people to engage more in exercise activity indoors whilst charging their smartphone battery. The word Exercycle stands for stationary exercise bicycle which is one of the famous devices used for indoor workout. The main function of this bicycle is can generate electricity by pedalling the bicycle which uses the concept of converting kinetic energy into electrical energy. Thus, the electricity generated from this bicycle can be used to recharge the batteries of electronic devices used during exercise. Furthermore, the Power Exercycle can also give pleasure to those who want to exercise since they can just pedal the bicycle indoors rather than find a suitable place outdoors that can waste their time and energy. Then, their exercise activities will be more

consistent because they can exercise at any time. Moreover, this product is also able to save electricity consumption because of its function which generates electricity through cycling that triggers kinetic energy to be converted into electricity [3].

This bicycle is packed with great features which include a digital display screen that can provide information about time, distance, speed, and calories. Besides, the screen is accompanied by a phone placement and a cable to charge the smartphone. These features are made to make it easy for people to use the smartphone while exercising and at the same time raise the smartphone battery. It is designed with a sturdy steel frame that provides extra stability and can withstand high resistance and a maximum body weight of 180 kg. This bicycle can also generate about 150 W per hour when we ride it which can be different depending on how fast we cycle, but probably not much more [4]. Therefore, this Power Exercycle can save electricity at home and reduce electricity bills.

The product is beneficial for the users as it can keep the smartphone battery rise, at the same time, improve health and physical fitness. In addition, this product can help those who are lazy to exercise outside because they only have to pedal the bike indoors. Thus, a person's exercise activities will be more consistent because they can exercise according to the schedule regardless of the weather conditions or the status of the air pollution outside the house such as haze. To sum up, Power Exercycle is used to encourage people to exercise regularly to maintain their bodies' health. It also can advise people to exercise more using this product because it is made 2 in 1 which can recharge smartphone battery while exercising to improve physical fitness.

INNOVATION DEVELOPMENT

An exercise bicycle or stationary bicycle has been introduced to the world since the 90s as indoor fitness equipment. In the hectic lifestyle of the modern era, the time for leisure activities is extremely limited as everyone was busy with their jobs and got less time to go outside, even going to the gym. Therefore, having this exercise bicycle at home might be the best solution for those who want to stay fit during a busy schedule. On the other hand, cycling on an exercise bicycle alone might be boring after some time and users tend to search for their smartphone to listen to music or watch videos when cycling. Moreover, over the year, this bicycle has already gained popularity among consumers and various technologies have been invested in this product for their advantage. This technology development includes a special exercise bicycle that we innovated, "Power Exercycle" which we modified to ease people to charge their smartphone while exercising. The objectives of our product are to maintain the user's smartphone battery during exercise, motivate users to work out regularly and reduce the current usage at home.

"Power Exercycle" has been modified from a normal exercise bicycle to a smart exercise bicycle that can generate electricity to charge a smartphone. This bicycle was packed with various features that were beneficial for users such as the electrical generator at the body below. This generator is able to generate electricity by converting the kinetic energy generated from pedalling the bike into electrical energy. When pedalling a bicycle, a person may produce about 150 W of power which is able to power a variety of electrical devices [4]. However, the amount of power that a person can generate while pedalling depends on their strength and how long they bike [4]. In our "Power Exercycle," we simply use the alternator that will create an alternating current to charge the smartphone's battery. The alternator has been chosen as it is commonly used in bicycles, produces more power and can be used to power the majority of

electronic devices including smartphones [6]. Thus, the amount of electricity used in homes can be minimised. Other than that, our product includes a digital display screen that will provide the users with information about time, distance, speed, and calories burned during cycling. This digital screen also uses the electrical energy generated from the alternator when pedalling the bike and it can be controlled just by touching the screen for all the information to be displayed.

Furthermore, there is an adjustable smartphone holder, cable port and smartphone cables below the display screen for the user to charge their smartphone conveniently. Due to the wide variety of smartphones available nowadays, various types of smartphone cables have been provided in our product such as type C cable, Micro-USB cable and lightning cable. In addition, the "Power Exercycle" body has been designed with a sturdy steel frame that can provide extra stability, withstand high resistance and can support a maximum body weight of 180 kg. Therefore, the user that has overweight problems or obesity can try this exercise bicycle for fitness.

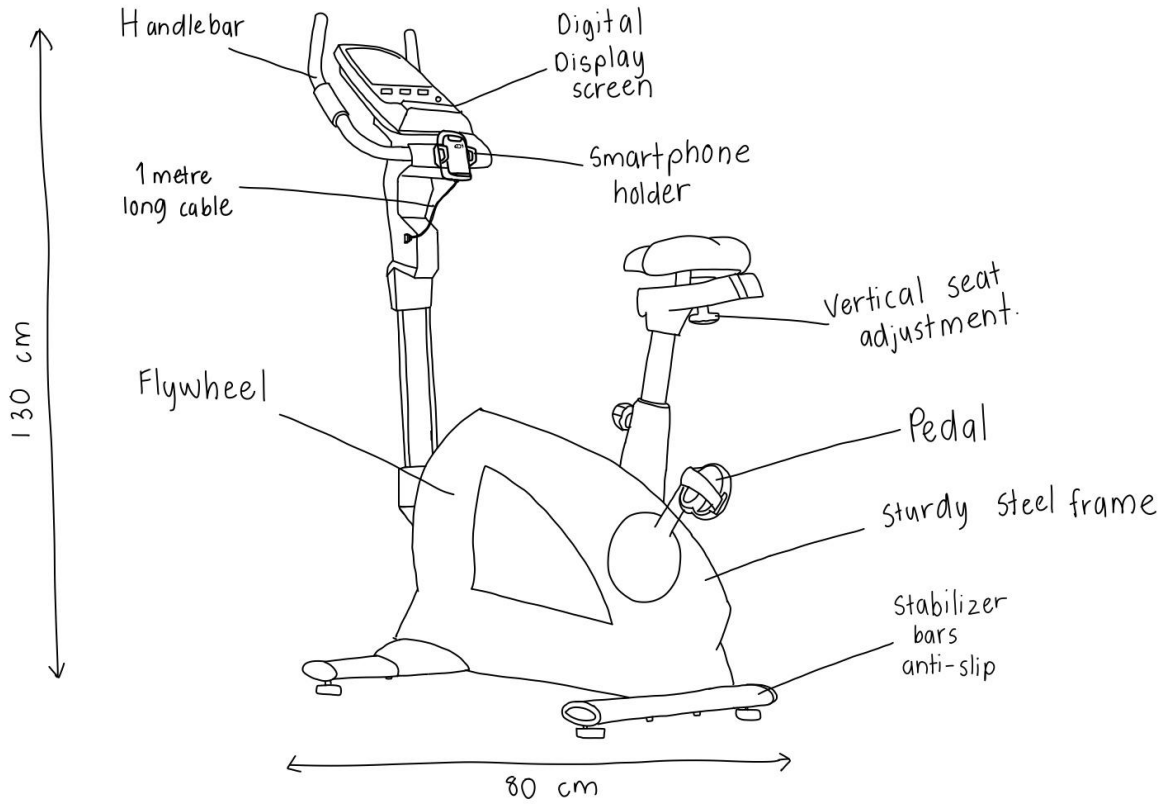


Figure 1: Side view of "Power Exercycle"

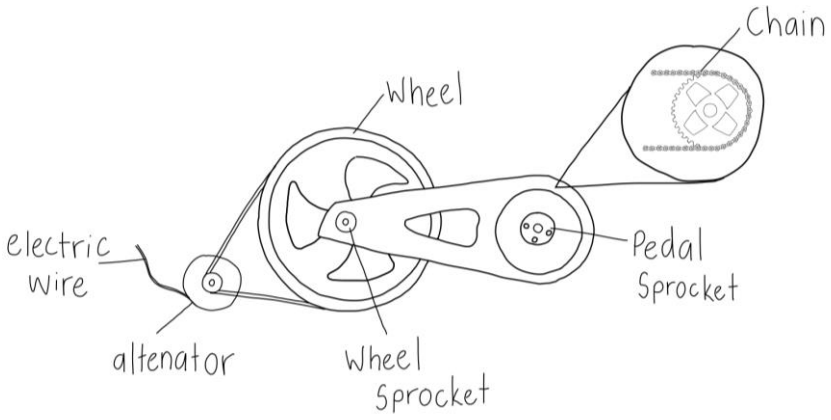


Figure 2: Flywheel of exercycle

COMMERCIAL POTENTIAL

Power Exercycle is a product to help those who love enjoying music or even scrolling social media while exercising. By introducing this product, we hope to achieve the primary goal of enhancing people's desire to exercise even while they are occupied with their regular routines at home. This product is also symbolizing the perfect combination of physical principles and fitness equipment to maximize the usage of a product whilst still considering the effect on the environment and other aspects.

This newly advanced invention is intended to solve the problems of almost every fitness enthusiast out there by charging their smartphone while exercising without putting them aside. Most of the time, people will need to find a plug or power source to charge their smartphone if it is running out of battery, hence, by introducing this technology we are optimistic that the problem will come to an end. The idea of this stationary bicycle will benefit society in terms of a new applicable concept of physics in gymnasium equipment. Furthermore, this product will also bring a positive impact on the environment. The Principle of Energy Conservation applied in this product will not require power sources to operate the charging mechanism and will reduce the usage of electricity that will lead to environmental degradation resulting from the emission of carbon dioxide produced from the heat [2]. This product will also help the users to reduce their household bills as it will definitely save electricity consumption by converting kinetic energy (pedalling) to electric energy (output) that will be used to charge the smartphone.

Power Exercycle has a lot of market entry prospects and can compete with existing gym equipment, particularly stationary bicycles. People who want to use their smartphone during exercise will be attracted to buy this product, especially fitness enthusiasts that do not want to waste their time while cycling. In addition, we believe that the product will be able to target persons who have socialising issues or social anxiety, requiring them to spend more time alone than in public only to ride a stationary bicycle in the gym. Furthermore, individuals who are still new to exercising will find this product to be a problem solution because they will not have to travel too far to acquire access to gym equipment because they can do it indoors in their own neighbourhood. However, we still believe that Power Exercycle will be able to attract more consumers, including adults and proprietors of gyms.

Cycling was also found to be a more efficient type of exercising rather than running [5]. This fact will surely raise consumer interest in purchasing this product because it is more convenient because customers can access it whenever they want by owning it, as well as the ability of Power Exercycle to recharge smartphones in an environmentally friendly manner.

The features offered by Power Exercycle will also set them apart from other stationary bikes now on the market as they will provide consumers with intriguing mechanisms.

All in all, Power Exercycle is the kind of product to be considered to maximize its usage whilst still minimizing the negative effects on the surroundings. This product also has high market potential due to its pedal-powered charging mechanism and other features that will allow them to compete with current stationary bicycles in the market. Power Exercycle will undoubtedly make indoor exercise more enjoyable and engaging.

CONCLUSION

People in the modern era rely heavily on electronic devices, which has many benefits but also results in laziness and decreased exercise. Even exercising while using electronics, such as jogging with music, is hindered by the need to charge a device, leading to fewer opportunities for exercise. The Power Exercycle is an indoor stationary exercise bicycle that is designed to enable people to engage more in exercise activities while charging their smartphone battery. It is able to save electricity consumption by converting kinetic energy into electrical energy.

Power Exercycle is a product designed to solve the problem of charging a smartphone while exercising. It combines physical principles with fitness equipment and does not use external power sources to operate the charging mechanism. This helps to reduce electricity consumption and benefits the environment. The product is targeted at fitness enthusiasts and those with socialising issues who need to stay in their own neighbourhood. It has good market prospects and can compete with existing gym equipment. Power Exercycle offers an efficient, convenient, and eco-friendly way to exercise and recharge smartphones. It also provides convenience for users by providing a digital display screen, phone placement and cable to charge the smartphone. It is set apart from other stationary bikes with its intriguing mechanisms and features, making indoor exercise more enjoyable and engaging. This product has high market potential and is the perfect way to maximize usage while minimizing environmental effects.

IMPROVISATION PLANNING

For future improvisation, we are planning to make three main changes which are as below:

1. Provide a charging platform that will charge other smart gadgets at once.

   Gadgets nowadays are significantly important among these generations. They have evolved into personal devices that signify social identity and status and provide multiple gratifications in the form of entertainment, information retrieval, time management, coping mechanisms, and social identity preservation [7,8]. By adding this new feature, it would satisfy people's need to utilise their gadgets while exercising, whether for entertainment purposes such as viewing movies or completing unfinished tasks or projects. It will indirectly improve one's efficiency because one will be able to multitask while exercising.

2. The faster the pedalling movement, the faster the charging mechanism.

   Currently, the power generated by the bicycles is capped at 150 W. To acquire the capability of charging other smart gadgets especially when they are charged at the same

time, more power will be required. Thus, we are planning on using a mini-transformer to increase the power based on the formula of Power = Voltage x Current (P = IV). The power produced by the generator will be increased as the transformer acts as a voltage stepped-up component. The generated electricity is then stored in the capacitor and utilised when the bicycle is turned on. Electricity will also be used to power the display panel and nearly all of the mechanisms that require electricity, making this device environmentally friendly.

3. Bluetooth connection with smartphones.

   We are also planning on adding Bluetooth features that will connect the smartphone to the bicycle. Users can easily track their blood pressure condition, pulse rate and others by just on the tip of their fingers. This record can be easily tracked by the users by accessing the apps that will be introduced in the future called “Exercycle " when the Bluetooth are connected. Other than that, the apps will help the users to track their cycling kilometres as the apps will do the calculation of pedalling average speed and do the estimations of the kilometres. Here, users can keep their health and other records when cycling and keep up with their health progress. Furthermore, the display panel will be able to play music and movies when both smartphones and Power Exercycle are connected. This will surely increase the market potential of this product and will attract more people to own it in the future.

Overall, Power Exercycle is projected to meet market expectations and compete with existing stationary bicycles on the market. The improvisations are also to be considered to ensure that this product will bring the users with the best experience when they are exercising with Power Exercycle.

ACKNOWLEDGEMENT

We would like to acknowledge and give our warmest thanks to our supervisor Madam A’bir Wardati who made this work possible. Her guidance and advice carried us through all the stages of writing our project. Each of the members of this project has provided extensive experience and professional guidance in completing this project. We would also like to express our sincere gratitude to UiTM Kampus Dengkil for letting us join this great event.

REFERENCES

[1] Strzelecki R., Jarnut M., Benysek G., Exercise bike powered electric generator for fitness club appliances (2007). pp. 1-8, DOI: 10.1109/EPE.2007.4417471
[2] Rehman, M. U., & Rashid, M. (2017). Energy consumption to environmental degradation, the growth appetite in SAARC Nations. Renewable Energy, 111, 284–294. https://doi.org/10.1016/j.renene.2017.03.100
[3] Arhun, S., Hnatov, A., Dziubenko, O., & Ponikarovska, S. (2019, January). *A device for converting kinetic energy of press into electric ... - KSPE*. A Device for Converting Kinetic Energy of Press Into Electric Power as a Means of Energy Saving. Retrieved April 15, 2023, from http://jkspe.kspe.or.kr/xml/22122/22122.pdf
[4] Suhalka, R., Chand Khandelwal, M., Kant Sharma, K., & Sanghi, A. (2014, June 2). *Generation of electrical power using bicycle pedal - IJRRR*. Generation of Electrical Power using Bicycle Pedal. Retrieved April 15, 2023, from http://www.ijrrr.com/papers7-2/10-Generation%20of%20Electrical%20Power%20using%20Bicycle%20Pedal.pdf

[5] de Azevedo Franke, R., Rodrigues, R., Geremia, J. M., Teixeira, B. C., Boeno, F., Rabello, R., Baroni, B. M., & Lima, C. S. (2021). Moderate intensity cycling is better than running on recovery of eccentric exercise-induced muscle damage. Physical Therapy in Sport, 50, 65–73. https://doi.org/10.1016/j.ptsp.2021.04.004

[6] Rajesh Kannan Megalingam, Pranav Sreedharan Veliyara, Raghavendra Murali Prabhu, Rocky Katoch Amrita Vishwa Vidyapeetham (n. d.) *Pedal Power Generation.* 1-5 Retrievedfrom https://www.researchgate.net/profile/Rajesh-Kannan-Megalingam/publication/259980152_Pedal_Power_Generation/links/5a2bb51baca2728e05dea52f/Pedal-Power-Generation.pdf

[7] Sarla, G.S. Excessive use of electronic gadgets: health effects. *Egypt J Intern Med* 31, 408–411 (2019). https://doi.org/10.4103/ejim.ejim_56_19

[8] Bian, M., & Leung, L. (2014). Linking loneliness, shyness, smartphone addiction symptoms, and patterns of smartphone use to social capital. *Social Science Computer Review*, *33*(1), 61–79. https://doi.org/10.1177/0894439314528779

Multiple Sclerosis: An Autoimmune Disorder

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ABSTRACT

Multiple sclerosis (MS) is an idiopathic inflammatory demyelinating disorder, a rare disease that affects 1 out of 1000 individuals. Advancement of technology in MS diagnosis through neuroimaging accessibility, and new biomarkers substantially benefited the MS patients. The objective of this study is to create an awareness program of MS towards Malaysians. TikTok Video of MS has been developed to provide the public a more holistic understanding of MS and to promote the MS Society Malaysia. A MS TikTok account has been developed which highlights the variety of MS information such as its symptoms, causes diagnosis and treatment management option. The platform used to not just reach the engagement of Malaysians but also people around the world. The outcome from a survey of 20 viewers and 115 viewers from TikTok using google form showed that more than half respondents are not aware especially of the symptom and the factor of the disease. This is the shortcoming of high-risk MS patients who should be diagnosed and get an appropriate treatment strategy immediately. This innovative social strategy further contributes to increasing the awareness of MS among society. In conclusion, the social media campaign of Multiple sclerosis successfully creates awareness among Malaysians.

Keywords: Multiple sclerosis; diagnosis; awareness

INTRODUCTION

Because multiple sclerosis is not a common topic of conversation, it is believed that many of us are unaware of it. We only have knowledge about diseases that affect people around us on a fairly regular basis, such malaria, tuberculosis, strokes, and especially heart disease. But do we ever mention that although multiple sclerosis and stroke are two completely different illnesses, they can sometimes feel and look the same? That's because both of these are bad for your brain. Even doctors sometimes struggle to differentiate between the signs of multiple sclerosis and strokes. The symptoms they induce, such as feeling lightheaded and dizzy, having speech issues like slurring, and finding it difficult to walk, are what connect MS and strokes. As a result, we have come up with some creative solutions to this issue in order to increase citizens' understanding of the condition by creating a video summary of its symptoms, prevention, and other aspects. We also set up a TikTok account and a Google form. Our study's goal is to develop an MS awareness programme for Malaysians.

The central nervous system (CNS) is impacted by the autoimmune disease known as multiple sclerosis (MS). The immune system attacks healthy tissue when a person has an autoimmune illness, just as it could fight a virus or bacterium. In MS, inflammation results from the immune system attacking the myelin sheath, which covers and shields the nerve

fibres. The nerves' capability to conduct electrical signals quickly and efficiently is enabled by myelin. There are 4 types of Multiple Sclerosis Clinically isolated syndrome (CIS), Relapse-remitting MS (RRMS), Primary progressive MS (PPMS) and Secondary progressive MS (SPMS). On the other hand, the early sign of Multiple Sclerosis is numbness and tingling, muscle weakness, bladder problems and others. Lastly, the risk factors for MS are smoking, age and Vitamin D deficiency. There is no cure for MS, but treatment is available that can slow the progression of the disease, reduce the number and severity of relapses, and relieve symptoms.

INNOVATION DEVELOPMENT

The innovation we made is our own video that will acknowledge the society about how important Multiple Sclerosis diseases. Giving the information clearly to the society about this disease will be the main reason why this study is done and this includes symptoms, treatments, causes, precautions and basic information about Multiple Sclerosis disease. A lot of knowledge and information gained by us based on research on internet, hearing explanation from experts such as professor and lecturer. In order to clarify whether our data is accurate and truth or not, all the data were referred to lecturer.
Other than video, we also conducted a survey via Google Docs platform to investigate society level of understanding about this disease and the survey link is spread using social media such as Telegram and WhatsApp. All respondents will rate their scale of understanding before and after watching our video as the link of our video is inserted on the survey page. All the responses will be the data and information for us to complete this study.

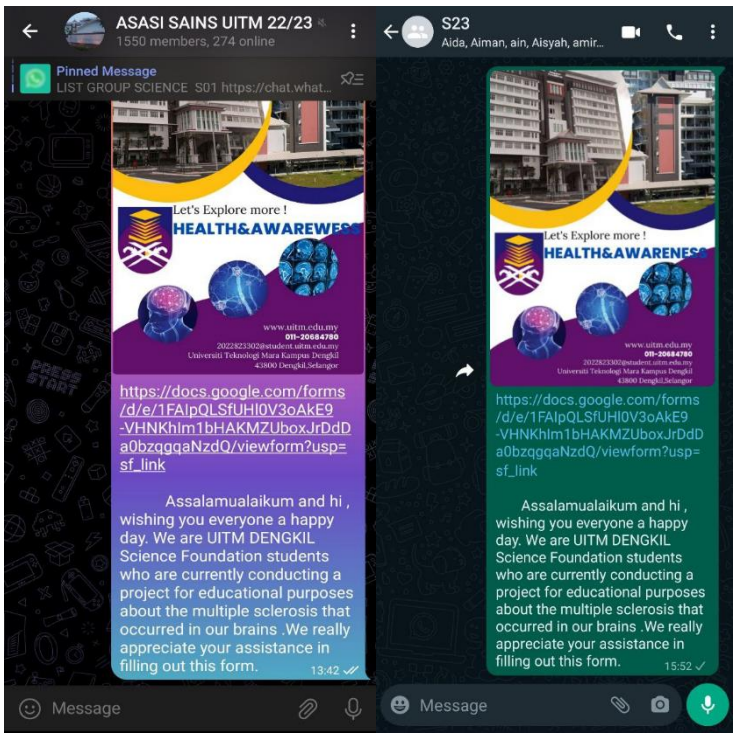


Figure 1: Sharing a google form.

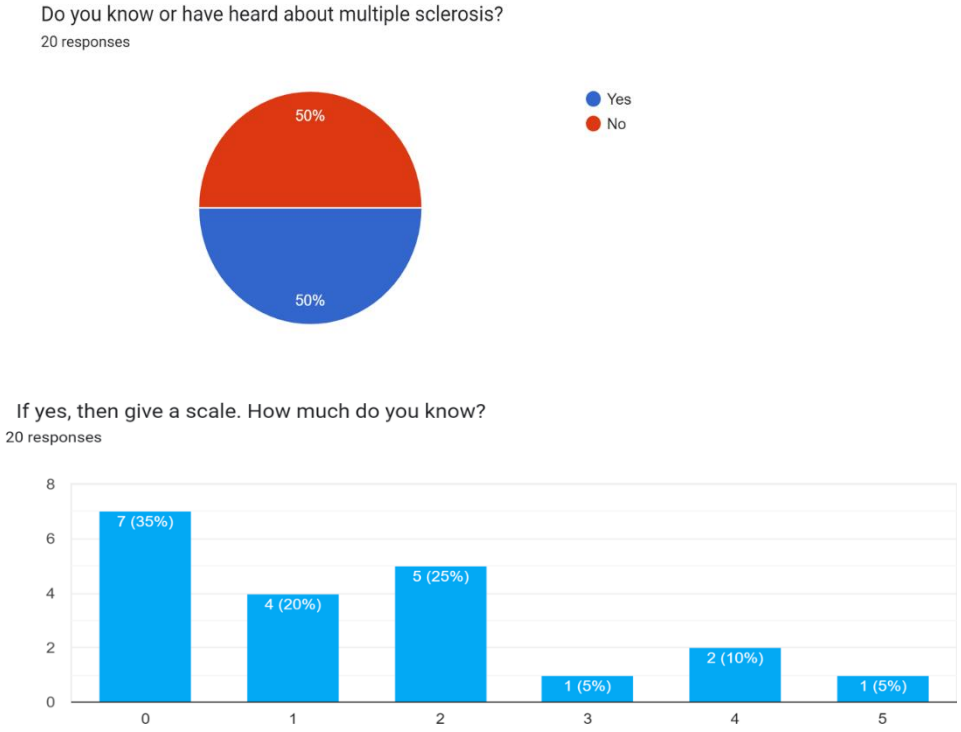


Chart and bar chart 1: Before informational video

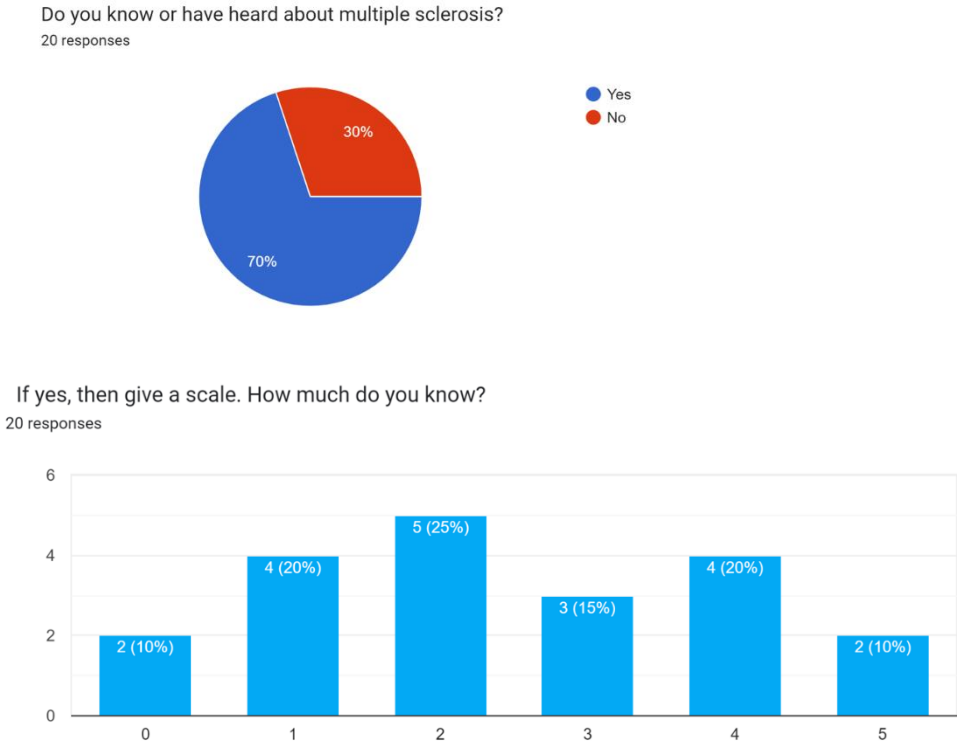


Chart and bar chart 2: After informational video

COMMERCIAL POTENTIAL

This effort is about to spread awareness to people about multiple sclerosis. We gathered information on people's knowledge about multiple sclerosis by asking them a series of scale questions to gauge their own level of understanding. The data collected according to the respondents' knowledge the multiple sclerosis show the same percentage.
According to the results, most of the respondents scored on a low scale of their understanding of the disease. Therefore, it reveals that the multiple sclerosis is not well known among people. In the next part, there was a link that given for the respondents to watch about the multiple sclerosis. Then, we gave them same questions for them to respond as their feedback for us about the input they gain from the video. Based on the data, it shows positive outcome.
We also study the article about Multiple Sclerosis. "People with MS can now be identified more quickly in the course of their illness because to advancements in diagnostic techniques and standards. Along with this, the availability, effectiveness, and risks of MS treatments have all grown tremendously. There is now a chance that 'pre-symptomatic MS' will be identified; as a result, potential preventive measures could be researched." (Dobson and Giovannoni)
In addition, we'll post our film on other social media sites like Instagram to expand our audience and spread the word about Multiple Sclerosis. Because less than 1% of the population has Multiple Sclerosis, we think that this video may be the first step in making people aware of a rare and novel disease. This is what motivates us to create a film production on Multiple Sclerosis, which demonstrates the need for them to be aware of more illnesses than just the common ones.



Figure 2: Posting the video on Instagram

CONCLUSION

To conclude, Multiple Sclerosis (MS) is a disease but the awareness about this disease is still very low among the society. Therefore, this disease was chosen as the topic to spread awareness and information. Five minutes video of information of Multiple Sclerosis including symptoms,

causes, prevention, and treatment of this disease was made and shared on TikTok and YouTube. Next, a survey was made using Google form and was shared to our friends and family members to test their level of understanding of Multiple Sclerosis before and after watching our video. From the survey, the majority of the respondents' level of understanding of Multiple Sclerosis increased after watching the video. They are more familiar and aware of the disease. For future development, we plan to create account to share information regarding multiple sclerosis in variety social media platform such as Facebook, Instagram, YouTube, twitter and many more. Improvisation we can do is by creating videos that visually appeals to everyone such as deliver the information from cartoon, animation, song and many more, so that our aim can be successfully delivered.

ACKNOWLEDGEMENT

This work would not have been possible without the support from of our lecturer, Mdm. Tengku Norbaya Binti Tengku Azhar who have been supportive of our project and who worked actively to provide us with additional information we needed. We are grateful to all of those with whom we have had the pleasure to work during this and other related projects. Thanks to Centre of Foundation Studies, UiTM Dengkil to support the advocative work of this project. Each of the members of the group has provided me extensive personal and professional guidance and taught me a great deal about both scientific research and life in general. Our group member, Sarah Faghira binti Azlan, Nur Irdina Safiyya binti Roslan, Muhammad Hadif Ammar in Razali, Megat Danish Hazim bin Megat Mohammad Kasim, Shahrul Ikhwan bin Saharul Farzul, who gives their best to complete this project together. Without everyone's support and motivation, this project will not be as successful as we think it will be. The completion of this project could not have been accomplished without the support of this group member despite our busy schedules and tons of work during our free time. Nobody has been more important to us in the pursuit of this project than the members of our family. We would like to thank our parents, whose love and guidance are with us in whatever we pursue. They are the ultimate role models.

REFERENCES

[1] Tobin, Oliver. "Multiple Sclerosis - Symptoms and Causes." Mayo Clinic, 24 Dec. 2022, www.mayoclinic.org/diseases-conditions/multiple-sclerosis/symptoms-causes/syc-20350269#:~:text=The%20cause%20of%20multiple%20sclerosis.

[2] Cleveland Clinic. "Multiple Sclerosis." Cleveland Clinic, 10 Feb. 2021, my.clevelandclinic.org/health/diseases/17248-multiple-sclerosis.

[3] Dobson, R., and G. Giovannoni. "Multiple Sclerosis - a Review." European Journal of Neurology, vol. 26, no. 1, 18 Nov. 2018, pp. 27–40, onlinelibrary.wiley.com/doi/full/10.1111/ene.13819, https://doi.org/10.1111/ene.13819.

[4] *Multiple sclerosis* (no date) *National Institute of Neurological Disorders and Stroke*. Available at: https://www.ninds.nih.gov/health-information/disorders/multiple-sclerosis (Accessed: 11 May 2023).

[5] *Multiple sclerosis (MS): Symptoms, causes, diagnosis & treatments* (2021) *Cleveland Clinic*. Available at: https://my.clevelandclinic.org/health/diseases/17248-multiple-sclerosis (Accessed: 11 May 2023).

[6] https://www.webmd.com/multiple-sclerosis/what-is-multiple-sclerosis

Eureka Ball

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ABSTRACT

Energy generating soccer ball is a product that is used to generate electric energy from kinetic energy. Generally, this product is mainly focusing on those who live in the area that have a problem that is related to electricity. However, we have found some problems with the existing product and that was the starting point of our product, eureka ball. We have made an upgrade to the product by adding gyroscopic motion on it as it can keep the motor spinning to generate electricity when force exerted on it. Also, we have changed the brushes motor to the brushless motor. This is because a brushless motor can reduce the heat production from the ball and it can prevent the ball from overheating when we use it.

Keywords: Generating soccer ball; generate electric; eureka ball; gyroscopic motion; brushes motor

INTRODUCTION

In today's world, we are all aware of the need to utilise eco-friendly and sustainable sources of energy to preserve the environment for future generations. One of the latest innovations in this area is the development of a ball that can generate electricity. However, we have come up with an idea to add other features in order to enhance the qualities of the ball by adding gyroscopic motion and a brushless motor. Hence, the name of our product is "Eureka Ball". This ball operates by making use of kinetic energy generated from its spinning motion to produce electricity. This technological advancement has the potential to revolutionise energy and provide a promising solution to the ever-growing energy crisis. Moreover, there are several problem statements that arise within the original product that the efficiency of the original product on producing electricity are low. This is due to a big amount of electricity produced may loss in form of heat because originally, the ball uses brush motor that include inadequate heat dissipation caused by the rotor limitations, high rotor inertia, low speed range due to limitations imposed by the brushes, and electromagnetic interference (EMI) generated by brush arcing. The second problem statement is that the product needs a large amount of force and needs to be continuously kicked in order to create a fair amount of energy to produce the electricity.

OBJECTIVES

1. Promoting renewable energy: The creation of a ball that generates electricity through kinetic energy can promote the use of renewable energy sources, reducing dependence on non-renewable sources of energy.

2. Encouraging physical activity: A ball that generates electricity through kicking can encourage physical activity and sports participation, promoting a healthier lifestyle.

3. Providing access to electricity in remote areas: In areas without reliable access to electricity, a ball that generates electricity can provide a source of power for charging devices or lighting.

4. Promoting sustainability: it can promote sustainability by reducing the carbon footprint associated with traditional energy sources.

5. Educational purposes: it can be used as an educational tool to teach principles of energy generation, conservation, and sustainability.

INNOVATION DEVELOPMENT

The main aim of the "energy generating soccer ball" is to produce electrical energy when it is subjected to force. This is particularly beneficial for people residing in rural areas where electricity is scarce. Jessica O. Matthew has invented the Soccket ball, an energy-generating soccer ball during her trip to Nigeria. This idea was generated when she saw a need for sustainable power in the small villages she visited and kids playing soccer. However, research has confirmed there are several lackness in this product. With that being said, we have come out with an idea of an innovation to the existing product by introducing our own product, Eureka Ball.

Originally, the ball used brush motors that include inadequate heat dissipation caused by the rotor limitations, high rotor inertia, low speed range due to limitations imposed by the brushes, and electromagnetic interference (EMI) generated by brush arcing. Therefore, we changed the brush motor to a brushless motor. This is more effective as it can reduce the heat production from the product. Also, it can prevent the ball from overheating when we use it. Furthermore, we have modified the existing energy generator socket ball by adding the gyroscopic motion as it is more efficient as the motor will keep spinning when force exerted on it.

COMMERCIAL POTENTIAL

Eureka ball is the product that we have modified from the existing product, “Energy generating soccer ball”. The purpose of this ball is mainly focusing on generating electrical energy when force is exerted on it. This can facilitate those who live in rural areas especially in the area that have a problem related to electricity. This product is also symbolising the perfect combination of physical while still considering the effect towards environment and other aspects.

This newly advanced invention is intended to solve many citizens' problems regarding electricity. This is because this product was created to be able to supply electricity without needing to be charged. The kinetic energy produced by the movement will be converted into chemical energy and stored in this product and can be used anytime needed so you can use it as an off-grid power source. Not to mention, the ball itself is the main equipment in football which is a popular sport among children and teenagers. This is because most people love being part of a football team as it can help develop positive social skills and teaches respect for others. Also, people find it fun, challenging, and exciting compared to other sports.

We believe that our product is able to compete with existing products on the market because it has a special design and benefits that can facilitate daily basis. Our main focus is on customers residing in regions facing electricity-related issues, as our products offer a unique solution by supplying electricity without requiring any charging. Additionally, we aim to cater to football enthusiasts, as our ball-shaped product is highly portable and efficient in converting kinetic

energy to electrical energy, thereby eliminating the need for charging.

Our product is an upgrade from the existing product, we expect the selling price may be a little expensive. Therefore, we plan to use cheaper equipment with high quality so that our products can be purchased by everyone in addition to providing benefits.

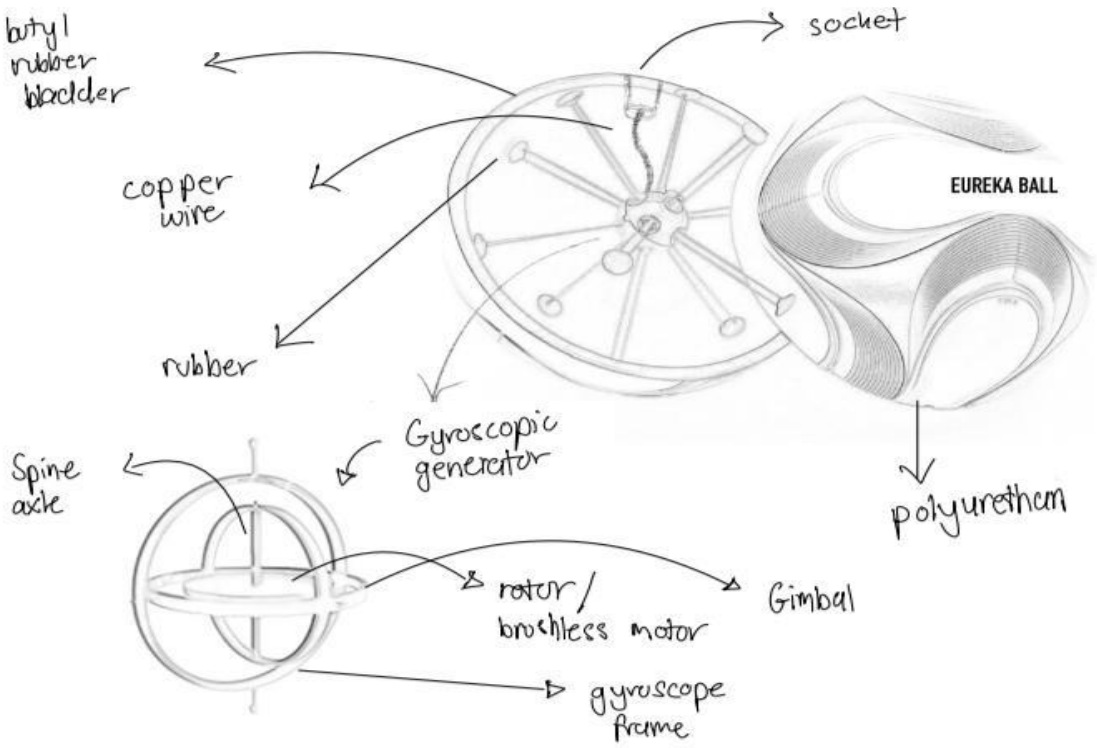


Figure 1: EUREKA BALL prototype

CONCLUSION

In a nutshell, our product has achieved the objectives stated earlier which by applying basic concepts of physics to improve the quality of life of the people who live in rural areas with shortage of electricity. This product will gradually increase the access for the user in the rural areas to use their gadget and prevent misinformation. Besides, our product can encourage the user to exercise while playing the ball at the same time while charging the ball. This product can promote sustainability by reducing the carbon footprint associated with traditional energy sources. This is especially relevant given the growing concerns around climate change and the need to reduce greenhouse gas emissions. The ball can contribute to a more sustainable future by harnessing clean and renewable energy sources and reducing our reliance on fossil fuels. This product also can help to raise awareness about the importance of renewable energy sources and the role that individuals can play in promoting sustainability and reducing their environmental impact. The ball can be used in schools, universities, and other educational settings to inspire and educate the next generation of innovators.

ACKNOWLEDGEMENT

First of all, we would like to thank Allah the Great Almighty for his constant blessing on us during every step of this journey to finish this project of Creations de UiTM. We successfully managed to come up with a new innovation and improvisation product that we believe will be

useful for citizens. Besides, we sincerely like to thank Sir Mohd Helmy bin Yusof for his guidance in this project. We are truly grateful for our respectable mentor because without his wise leadership and knowledge, we would have not been able to complete this project successfully.Also, we would like to express our sincere gratitude to UiTM campus Dengkil for letting us join this great event. Lastly, this project cannot be completed without the great effort from our group members, Asnor Amirul Bukhari bin Asnor Muizan, Amar Sofyan bin Zainal, Nurin Imanina Alysha binti Azli, Nurina Damia binti Rifdi Tahkim, and Syafiqah Wahidah binti Mohd Yasin.

REFERENCES

[1] Michelle Starr, (2014), Power-generating soccer ball fails dismally https://www.cnet.com/culture/power-generating-soccer-ball-fails-dismally/
[2] Tim Madigan & Tim Delaney (2009), Sports: Why People Love Them! from https://books.google.com.my/books?hl=en&lr=&id=_leJMTGB3OoC&oi=fnd&pg=PR5&dq=why+people+love+sports&ots=IS3vm7Gk9O&sig=6Btki94rFXjak7nBzsVtAYVz4do&redir_esc=y#v=onepage&q=why%20people%20love%20sports&f=false
[3] Padmaraja Yedamale Microchip Technology Inc (2003),Brushless DC (BLDC) Motor Fundamentals http://electrathonoftampabay.org/www/Documents/Motors/Brushless%20DC%20(BLDC)%20Motor%20Fundamentals.pdf
[4] Ward Brown Microchip Technology Inc (2003), Brushless DC Motor Control Made Easy http://ww1.microchip.com/downloads/cn/AppNotes/cn012037.pdf
[5] Hiroshi Hosaka & Yuki Tajima (2020), Analytical and Experimental Study on Gyroscopic Power Generator with Power Feedback https://utgg.jp/en/wp-content/uploads/2020/09/SAM2020_2846.pdf
[6] Hiroshi Hosaka & Yoshinori Oonishi (2019), High-power Vibration Generator Using Gyroscopic Effect https://utgg.jp/en/wp-content/uploads/2020/09/SAM2019_2296.pdf
[7] Jihoon Chung & Sangmin Lee (2018), Hand-Driven Gyroscopic Hybrid Nanogenerator for Recharging Portable Devices https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6247056/
[8] Reinhard N.Lahde (1972), BRUSHLESS D.C.MOTORDREVEN GYROSCOPE https://patentimages.storage.googleapis.com/18/ac/19/4b74226a625b0c/US3664199.pdf

Sparkle Aplenty

***Nurul Huda Mohd Noor, Muhammad Saiful Hedayat Tullah, Mohamad Afif Hilmi Mohd Najmi, Mohd Harris Muhammad Rehman, Muhammad Nurazhim Mohd Azman, Muhammad Fathurrahman Ayub**

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ABSTRACT

One of the most crucial jobs is cleaning the toilet so that the area where we clean ourselves is constantly free of any pollutants. However, it is really challenging because it takes a lot of effort and time. Due to a lack of time and exhaustion from a demanding class schedule, many students do not clean their toilets. So, we decided to develop a toilet cleaning equipment innovation that would benefit the market. Our product uses an extremely rough and abrasive brush where it will support the entire weight of the body while standing if it is positioned beneath the slippers. Consequently, the body's weight can be utilized to wash the toilet floor with little effort. These sandals' bottom surface can be taken off since Velcro strap holds the brush to the bottom of the footwear. Therefore, a different surface type, such as microfiber, can be used to wipe the floor, allowing it to dry more quickly. Our products use high quality microfiber cloth that can swiftly absorb significant amounts of water. All these ideas were also applied to gloves. Thus, the issue of exhaustion and a lack of time when cleaning the toilet may be solved with Sparkle Aplenty.

Keywords: Exhaustion; microfibre; footwear

INTRODUCTION

Cleaning the toilet is one of the most important tasks to ensure that the area where we clean ourselves is always free of any pollutants. It is quite difficult, though, because it requires a lot of time and work. Many college students who live on campus don't clean their toilets because they lack the time and are worn out from a hard educational schedule. Many kids use filthy restrooms every day, which is undesirable because it might cause an increase in infections. We have heard reports of numerous guys chastising pupils for using the filthy restrooms. As a result, a lot of students could rebel and feel stressed. Our group has made the decision to create a market-friendly breakthrough in toilet cleaning equipment. We chose to modify already-existing toilet brushes. To make washing the floor even simpler, we placed a brush underneath the sandals. For scrubbing, the glove's surface may be converted to a brush, and for wiping, it can be utilized as a microfiber surface. Another feature we include in our products is a place to put the soap so that it is easy to add soap during the washing process. The issue of exhaustion and a lack of time when cleaning the toilet may be solved with Sparkle Aplenty. In this project, all relevant details on the advantages, cost analysis, target market, and product specs will be provided. Before deciding on our project, we raised several issues in our conversations. We have gathered some information from a small group of students to identify the issues and limitations of typical cleaning supplies. According to our research, standard cleaning brushes take a long time to remove dirt and are difficult to use on floors with dirty stains. So, it will take more force and energy to clean the dirt [1]. Additionally, using a standard brush requires bending over, which negatively affects our posture. Other than that, typical toilet brushes are

made of low-quality materials, which readily crack and fall off after numerous uses. The cost of repeatedly purchasing toilet brushes will be high. The next problem is the sluggish drying of many surfaces after cleaning. For instance, a mirror in a steamy, wet bathroom makes it challenging to see the face since it is not clear. Thus, after considering all the problems regarding the current toilet cleaning tools, our group decided to improvise and add some special features to the toilet brush and gloves. By using physics concepts, we have learnt, we hope our Sparkle Aplenty can bring more benefits not only to students but to all cleaners and households.

INNOVATION DEVELOPMENT

Sparkle Aplenty is a toilet cleaning equipment innovation that would benefit a lot its user.We implement several physic theories on our product to improve the efficiency in our product [2]

- The main material used to make the sandal were Acetal (Polyoxymethylene, POM) which is known for high resistance to heat, abrasion, water, and chemical compounds. This will make our sandal durable and long lasting.
- The main material of our gloves was made of combination of Polyester and Nitrile Butadiene Rubber. This material is waterproof so it will make the user more comfortable wearing them because no water will be absorbed.
- The brushes were made of Brown Coir Fibers which is the same material to make coir brushes. This material has high friction coefficient; hence the scrubbing process will be much easier.
- The fabric we use is high-quality microfiber fabric. The fibres in microfiber fabric are so tiny and dense that they create more surface area from dirt and dust which will make cleaning dust and dirt more efficient.
- On the outsole of our sandal and gloves, we insert a Velcro Strap. This will able the user to convert between brushes or Microfibre fabric.
- To make the cleaning much more efficient, detergent capsules were placed inside the brush and microfibre fabric. This can help the stain detached easily because detergent can reduce the surface tension between floor surface and stain.
- Sparkle Aplenty sandals sizes start with 5 UK to 12 UK and the gloves size is small, medium, large and extra-large. This will enable everyone to use them.

We apply force concept in our product as shown in Figure 1 and Figure 2. The forces that we applied on our product is force and friction force. Friction force is used to remove the dirt and stain on the surface [1]. The brush we use are very rough which lead to higher friction force. The higher the friction force, the easier the dirt and stain removed.



Figure 1: All the forces involved in Sparkle Aplenty

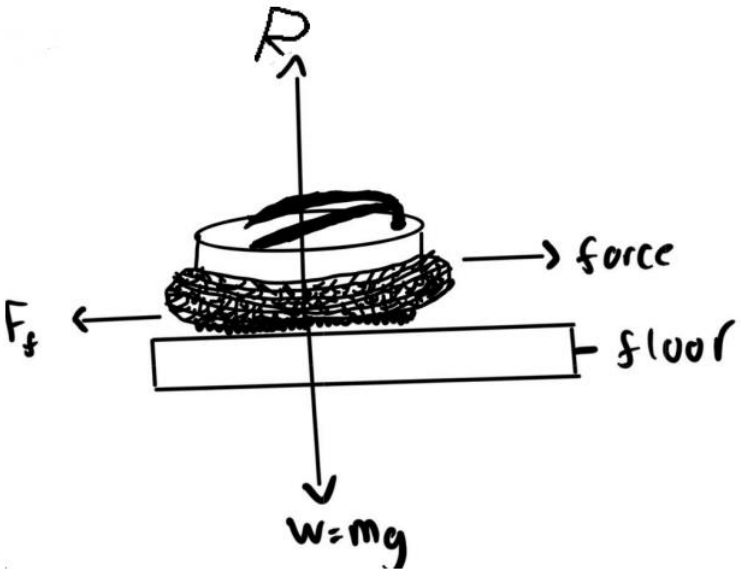


Figure 2: Application of forces in our product.

COMMERCIAL POTENTIAL

Our main target market is students. This is because everyone needs to clean their toilet occasionally. However, time is very limited due to a packed schedule. That's why we created a set of brush gloves and sandals that can be used for showering activities while simultaneously cleaning the toilet. Students need to save their time as they have lots of assignments and tutorials waiting to be done. These products not only serve as cleaning tools that could save a tremendous amount of students' time but also look aesthetically simple. Therefore, the brush gloves and sandals set which is also known as Sparkle Aplenty is very suitable for those who are very concerned about their time management. In addition, this Sparkle Aplenty product should be purchased by students because it is very easy to use to clean the toilet in a short time. This is

because the product comes with detergent pills which are very effective for cleaning the floors, walls and sanitary fixtures. The detergent pills can be used by either stepping on it is using the sandals or crushing it by hand while wearing the glove which can be quite satisfying.

We have made an analysis based on past research on the internet and our own past experiences and we have found that the affordable selling price of the invention is around RM75.70 considering a profit margin of 10%. The list of raw materials and prices are shown in Table 1[3,4].

Table 1: List of prices of raw materials

Materials	Quantity	Price /each
Gloves	1	8.90
Sandal	1	19.90
Coir brush	4	2.00
Detergent capsule	4	0.50
Microfibre fabric	4	1.00
Velcro strape 15mm*150mm	1	23.90
Magic sponge 60mm*50mm	4	1.50
Shoe insole	2	5.00
UHU Contact liquid	1	6.90
	Total	RM 75.70

Our product has a great potential to be marketed. To make an example out of this, firstly we can advertise our product through competition on social media. This way we can attract a way larger marketing audience. Secondly, we can share an interesting poster on our product through email. Email is one of the fastest ways to share information. Lastly, we can also advertise our product via sharing our customers' reviews. With great reviews we surely will buy ourselves a good reputation which will lessen our future customers' doubt and make it easier to buy our product.



Figure 3: Sparkle Aplenty

CONCLUSION

Sparkle Aplenty will continue to develop by adding more features in the future. One of the prominent features that will be added to Sparkle Aplenty is by adding other type of surface to be replace the brushes and microfibre fabric such as rubber surface. This is suitable to be used by elders to prevent them from slip off the floor. Secondly, we will add more variety of colour to our product. This will make our product more interesting and will attract kids to wear them. We also will wider our market such as on online platform and reseller so that our product is easy to get.

ACKNOWLEDGEMENT

First, we would like to thank God for letting us finish our innovation. We also have put all our effort in order to complete this group project. Without our group members' cooperation, we cannot manage to complete this project within the given time. So, we would like to express our gratitude to all our group members for all their hard work. We would also like to say thank you to our teacher, Mrs Nurul Huda Binti Mohd Noor who helped us a lot to finish this group work. Lastly, we also like to give our special thanks to our parents for supporting us throughout our hard time during this project.

REFERENCES

[1] https://byjus.com/physics/frictional-force/
[2] https://offer.alibaba.com/cps/e1f5f93f?bm=cps&src=saf&tp1=5c675efbcb5bc
[3] https://www.refinery29.com/en-us/amazon-mop-slippers-review
[4] https://en.wikipedia.org/wiki/Force

Rechauffer

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ABSTRACT

Rechauffer is an established innovation with an excellent heat insulator that applies the physics concepts such as Specific Heat Capacity and thermal contact. As we know, most of the food containers in the market are not great heat insulators. This causes the food that we put into the food container is not warm and it can't really maintain the temperature of the food for a long period. So, people lose interest in bringing the homemade food because of that issue and prefer to buy the food at the restaurant. We create the Rechauffer tiered. Thus, it can provide a lot of space for the users to bring a variety of food. Other features that were applied include, the materials and the weight of the Rechauffer. Rechauffer has a high potential to encourage people to bring the food from their home. Rechauffer comes with specifications that focus on helping the customer pack their food in the proper way possible and keep the temperature of the food whether it is cold or hot. Rechauffer has some integral improvements that can make our lives better as we can enjoy the food while at its desired temperature and have the best high-quality meal.

Keywords: Insulator; temperature; homemade food; thermal contact

INTRODUCTION

As we know that we are advised to bring our own meals from home to maintain food hygiene and safety. There are a lot of benefits of bringing our own meals from home. For instance, we can prevent ourselves from facing food poisoning and we can choose the quality of food to eat. According to Dr Eileen Candy, Head of Department Nutrition and Dietitian said "Freshly cooked and consumed food has multiple health benefits" [1]. This statement proves that homemade meals are healthier than food that we buy at the restaurants. We created this Rechauffer to encourage people to bring their own meals from home. With this Rechauffer, all the people can bring their meals easily. Our group comes up with a market-beneficial-innovation for someone to keep their homemade food. Our Rechauffer is established with an excellent heat insulator that applies the physics of Specific Heat Capacity that can be defined as the quantity of heat (J) absorbed per unit mass (kg) of the material when its temperature increases 1 K (or 1 °C), and its units are J/(kg K) or J/(kg °C) [2]. Home-cooked food is said to be better for our health if we choose the right ingredients since we are in control of what we are adding to the food. When we bring our lunch, we're able to limit the temptations of add-ons that are loaded with fat, salt, and sugar. With Rechauffer, people can enjoy their homemade food while it's still hot since our product has a vacuum flask feature located in the internal surface of the box that puts a stop to heat transfer. For that reason, we can savour the original taste of our food items and be able to enjoy them when we get a moment.

There are a few problems that we considered before we decided to start our project. We have collected some data and done the research about why people didn't bring the homemade food from home. Based on the information that we got from them, most of the food containers in the market are not great heat insulators. For example, some workers bring homemade food to their workplace in the morning and eat the food for lunch. However, the food does not taste so good because it is not warm anymore. This will make people lose their appetite. Another example is the food will easily stale if we do not put the food in the food container that can maintain the temperature and have a good heat insulator. It will cause food wastage. Furthermore, due to Covid-19 pandemic people prefer to bring their food from home because it is more secure, but they can't choose the best food container to put their food. Thus, after considering all the problems regarding the current food container that we have in our country, our group decided to improvise and add some special features to the food container. By using the physics concept that we have learnt, we hope our Réchauffé can bring a lot of benefits to all users, and they will be happy and satisfied with our product.

INNOVATION DEVELOPMENT

Rechauffer is a unique and innovative product that is inspired by thermos. This favors people who love to bring their own meal from home to keep warm for a long time and still taste good when we consume it. There are few physics theories that apply to this product as shown in Figure 1.

- The most important part of Rechauffer is the stainless steel as the box for food storage. The inner part of the food container is exposed to water and air. This greatly encourages the rusting process to occur in food containers. As we all know, rust is a very dangerous substance that can harm human health and contaminate food quality. Stainless steel is used because of its rust-resistant properties. Thus, the quality of food is protected. In addition, the shiny surface of stainless steel can prevent heat leaving or entering by reflecting the heat to food and can reduce heat loss. This can keep the food hot.
- Next, in Rechauffer there is a vacuum between the two layers of stainless steel and cork to prevent conduction [3,4]. Since a vacuum is a medium free of materials, it provides effective insulation. The phenomenon of heat transmission from food to stainless steel and cork is constrained by this.
- Another main part of Rechauffer is cork. Cork is a very good thermal insulator as it will reduce heat transfer [3]. In Rechauffer, cork layer and stainless-steel layer is used to create a vacuum condition between them. Cork also used to support food storage to prevent the surface of the food container from coming into direct contact with the PVC layer.
- The PVC plastic is the outermost part of Rechauffer. It is used as the lid, handle, outer part of the food container and lock of Rechauffer. It has low thermal conductivity which makes it a good insulator [5]. PVC is a very strong and long-lasting material. To add on, PVC is a lightweight material. This makes our product, Rechauffer durable and easy to carry as it is light.
- Silicone is used at the lid of Rechauffer to prevent food leakage because of its water resistance property and act as a sealant. Silicone is also used at the handle of Rechauffer. It has a rubbery texture that exhibits anti-slip and tends to be very grippy. It is more comfortable for the user to hold it and bring it anywhere.
- Rechauffer has 3 levels of compartments that are easy to install and remove. Each level is held together using a lock made of PVC. Consumers are free to use all levels or just one, depending on their individual needs. Other than that, it also has a handle that is made of PVC and silicone on the upper part of Rechauffer makes it portable. This is proven that

Rechauffer is a user-friendly product.

- Rechauffer is square in shape with measurement $17cm \times 17cm \times 10cm$. The measurement of stainless-steel box is $15cm \times 15cm \times 8cm$. Due to its large volume, this product can store food in a large capacity. Approximately, up to 1.3 kg of cooked rice can be stored in one compartment of Rechauffer. It is estimated that 1.5 liters of soup can be filled in one compartment of Rechauffer. Describe the innovation development in sufficient detail with evidence to support the originality and novelty of the product. Illustrate a complete prototype/system/sample with images/figures complete with labels. Highlight the inventive features of the product.

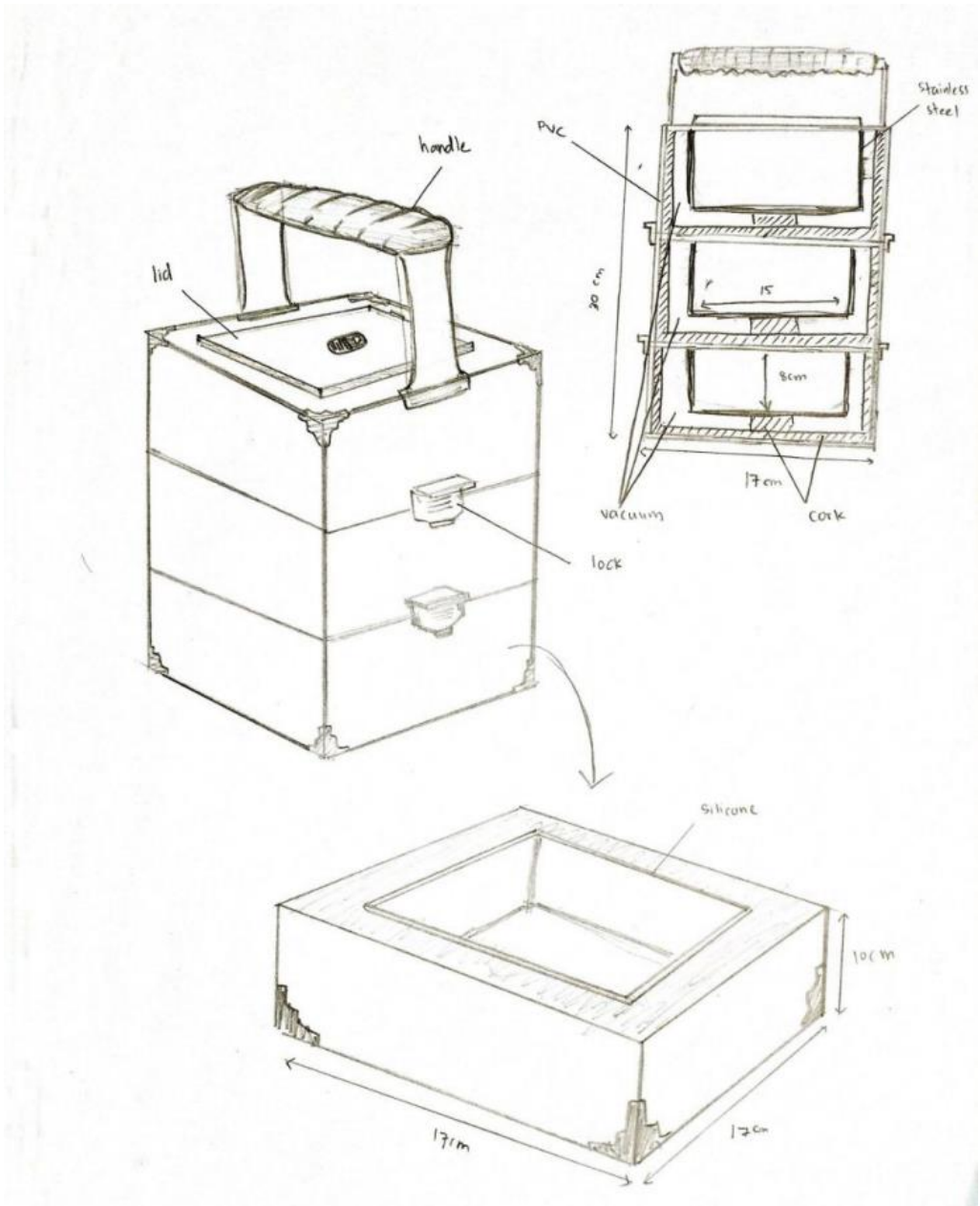


Figure 1

COMMERCIAL POTENTIAL

We have made an analysis based on past research on the internet and our own past experiences and we have found that the affordable selling price of the invention is around RM105.00 taking into account a margin of 25%. The list of raw materials and prices are shown in Table 1.

Table 1: List of prices of raw materials

Materials	Quantity	Price /each
Wood board A3	4	6.90
Kertas pasir	1	1.50
Hot melt glue	1	3.80
Wallpaper	2	2.10
Needle and thread set	1	2.90
Linen tablecloth 150*180cm	1	23.90
Aluminum foil	2	5.00
Indoor mounting tape	1	13.50
Cork sheet	2	5.00
Double sided tape	2	2.50
Velcrotape	1	7.50
Loyang	3	10.00
	Total	RM 139.90

Our product has a great potential to be marketed. To make an example out of this, firstly we can advertise our product through competition on social media. This way we can attract a way larger marketing audience. Secondly, we can share an interesting poster on our product through email. Email is actually one of the fastest ways to share information, research also said that 82% of potential customers checked their email from time to time. Lastly, we can also advertise our product via sharing our customers' reviews. With great reviews we surely will buy ourselves a good reputation which will lessen our future customers' doubt and make it easier to buy our product.



Figure 2: Rechauffer

CONCLUSION

Our product Rechauffer comes with specifications that focus on helping the customer pack their food in the proper way possible and keep the temperature of the food whether it is cold or hot. Rechauffer has some integral improvements that can make our lives better as we can enjoy the food while at its desired temperature for the next few hours and have the best high-quality meal. Rechauffer will continue to innovate by adding more features in the future.One of the prominent features that will be added to Rechauffer is its lid.Currently, Rechauffer has a lids made of silicone,in the future, Rechauffer would increase its security by adding a locking clamp to prevent accidental opening and secure our food.

ACKNOWLEDGEMENT

First, we would like to thank God for letting us finish our innovation. We also have put all of our effort in order to complete this group project. Without our group members' cooperation, we cannot manage to complete this project within the given time. So, we would like to express our gratitude to all our group members for all of their hard work. We would also like to say thank you to our teacher, Mrs Nurul Huda Binti Mohd Noor who helped us a lot to finish this group work. Lastly, we also like to give our special thanks to our parents for supporting us throughout our hard time during this project.

REFERENCES

[1] WHO, “A guide to Worl Food Safety Day 2022,” *Sustain. Dev. Goals*, vol. 7, no. 6, pp. 1–8, 2022, [Online]. Available: https://www.who.int/campaigns/world-food-safety-day/2022%0D.
[2] Helmenstine, Anne Marie, Ph.D. (2023, April 5). Specific Heat Capacity in Chemistry. Retrieved from https://www.thoughtco.com/definition-of-specific-heat-capacity-605672
[3] Cork insulation: Applications, Properties, Advantages & Cost, 2018
[4] How does a vacuum flask reduce heat loss,2018.
[5] Learn How Thermoses Work! A Moment of Science - Indiana Public Media. Orem, W., 2015

i-DRY

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ABSTRACT

The Smart Dry Hanger is suitable for various types of clothing, allowing users to utilize it with a variety of garments. It also includes a tubular hanger for drying all types of shoes, including boots. These features provide various advantages to consumers in their daily lives. This product is environmentally friendly because it reduces the unnecessary use of external energy. The need for dry hangers has increased because of the difficulties that every student and worker face while doing laundry. According to our survey, students spend money on dryer machines at least twice a week when doing laundry, or they hang their clothes out to dry on a clothesline to save a little money and need to stand in a long queue due to the lack of dryer machines. Each of these methods has one ultimate problem which is energy and time-consuming for drying machines and hanging clothes respectively. When using a drying machine, the user must be punctual and not be late to avoid creases on the clothes if they are taken out of the dryer later than the required time. Thus, providing an excellent dry hanger stand would extend our consumer base and increase revenue in our economy.

Keywords: Hanger; dry; drying machines; garments

INTRODUCTION

There are a few problems taken into consideration before deciding on our project. We have collected data from students at UiTM Dengkil to acknowledge the problems and weaknesses of their current method of drying laundry. According to our results, many students spend money on dryer machines at least twice a week when doing laundry, or they hang their clothes out to dry on a clothesline to save a little money. The weather is also a major contributor to this problem. Those who hang their clothes on the clothesline might have a problem when it rains. They will not be able to dry their clothes in time, or they may have to rewash their clothes because of the rain and will be unable to pick up their clothes on time. Some students claim that using the drying machine too frequently causes budgetary concerns. Using a drying machine is not inexpensive, and while it is affordable, if used frequently, one may run out of money before the end of the month. In this instance, unless they have enough money for the rest of the week, fewer students would use the drying machine frequently. As a result, after considering all the issues with the current laundry drying process, our group decided to upgrade and enhance the current hanger.

The main purpose of our project is to reduce wait time and to make matters easier if an unexpected situation occurs such as rain, or urgent matters. Our product also enables users to reduce costs and expenses with a good investment, and conserve energy by using less time to complete laundry activities. The Smart Dry Hanger (i-DRY) will allow clothes to dry faster. Users can use this product without risk due to our special features and anti-overheating

technology by using cooling fan and portable heater. In addition to drying clothes, users can also utilize the tubular hanger that is provided to dry their shoes or boots on the same hanger. We have also installed a rechargeable power source that can last for a great amount of time to make it easily accessible for travellers.

INNOVATION DEVELOPMENT

The Smart Dry Hanger (i-DRY) is made of heat-resistant material. Flame retardant ABS is an ideal material in the base for impact resistance, strength, and stiffness. Polycarbonate (PC) offers good heat resistance and is thermally stable up to 135 C and can be improved for further heat resistance by adding flame retardant. This hanger is made from a material that allows clothes to dry instantly and has high heat resistance. The portability and lightweight of this hanger make it convenient and made for on-the-go users to take it with them virtually anywhere and suitable for traveling. Apart from that, the load bearing of this hanger is a maximum of up to 5 kg which means that it can hold heavy items of clothing as they dry. The power source of this product is rechargeable and can last up to 6 hours by default working with 150W of power. This product's ability to recharge makes it more convenient for people to use it when they are traveling. i-DRY has an effective anti-overheating technology that turns off the heating after an hour. This helps prevent the kind of overheating that can ruin clothes. It is also safe for users to use even if they fail to turn off the power, as this will have no effect on the product or garments. It is not only capable of drying our clothes, but also of making them clean and pleasant. The time taken to complete one drying session ranges from 30 minutes to 1 hour depending on the number of clothes and the weather. The air cover is formed inside the clothes so that the hot air can gather and circulate in the clothes to dry quickly.

COMMERCIAL POTENTIAL

Our main target refers to people who have less acquired time to do the laundry, specifically college students and busy workers. Since our product is time efficient, it is ideal for students. Our product is important for students to acquire because it is inexpensive and can be considered a wise investment. Seeing as many students spend money on drying machines, the Smart Dry Hanger will help them save money. Busy workers may not have time to undertake duties such as laundry. They can reduce workload by utilizing our product because it results in wrinkle-free clothes and can be worn immediately after drying. Hence, it will not need to be folded before wearing. In some ways, we would like to reach out to people who wish to lower their electric bills and save the environment from rising electrical energy costs, as our product is energy efficient and decreases one's carbon footprint.

We have made an analysis based on past research on the internet and our own past experiences and we have found that the affordable selling price of the invention is around RM91.90 considering 25% of profit. The list of raw materials and prices are shown in Table 1.

Table 1: List of prices of raw materials

Materials	Quantity	Price /each
Hanger	1	4.90
Fan	1	16.90
Hose (15cm*2)	15	13.80
Spray paint	1	18.30
Portable heater	1	24.00
Paper lunch box	1	23.90
Cable tie	1	7.90
Cloth wardrobe	1	20.00
	Total	RM 91.90

Selling price: 125% x RM91.90 = RM114.90

Our product has a great potential to be marketed. To make an example out of this, firstly we can advertise our product through competition on social media. This way we can attract a way larger marketing audience. Secondly, we can share an interesting poster on our product through email. Lastly, we can also advertise our product via sharing our customers' reviews.With great reviews we surely will buy ourselves a good reputation which will lessen our future customers' doubt and make it easier to buy our product.



Figure 1: i-DRY

CONCLUSION

The Smart Dry Hanger (i-DRY) is really useful in our daily lives but it still needs improvisation. The Smart Dry Hanger can only hang a piece of cloth at a certain time. So, we came out with an idea to make it a rack in the future. It may allow users to hang more clothes at the same time. These may help us save time better, so it becomes more efficient.

ACKNOWLEDGEMENT

Firstly, we would like to thank Allah the Greatest for easing our journey and allowing us to complete this project. Apart from that, we would like to express our heartfelt gratitude to thank Madam Nurul Huda Mohd Noor, our advisor's advice and support in assisting us to complete this innovation project. In addition, this assignment also cannot be completed without the efforts of our group members, Nur Athirah Azman Junaidee, Nurul Azreena Mohamad Fazil, and Nurina Najwa Shamsudin. This project has taken a lot of time and work on our part. We feel that our invention will be useful currently, where consumers place a high value on "i-DRY" for convenience. Finally, we would like to express our heartfelt gratitude to our friends for supporting us and giving us feedback. Hence, thanks a bunch to them.

REFERENCES

[1] 5 Ways to Dry Your Clothes Better with a Dryer | Bosch Home Appliances. (n.d.). Bosch home appliances. Retrieved November 11, 2022.
[2] Flame Retardant ABS - ABS FR Flame Retardant. (n.d.). Emco Industrial Plastics. Retrieved November 11, 2022.
[3] Guide, s. (2021, July 12). 6 Benefits of a Dryer That Can Change Your Life. Electrolux.vn. Retrieved November 11, 2022.

Dietary Intake Program for Anaemia Patients: A Social Innovation Project

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ABSTRACT

A common disease, called anaemia, has always been neglected by society. Most people are not aware of how bad this situation can be, especially about the suitable food for anaemic patients. In fact, there are roughly a million deaths per year of anaemia patients worldwide. Lack of awareness regarding this issue among people nowadays should cease to bring more attention to anaemia patients. Thus, it has led to the implementation of the video project titled "Dietary Intake for Anaemic Patients". The objective of this program is to create a campaign to increase awareness among people in having a wise management of diet for anaemia patients. A production of an informative video was used for this project. This video discusses the objective of this program, the potential of this video, causes of anaemia, symptoms, and the healthy diet that is good for anaemic patients. Five students of Centre of Foundation Studies, UiTM, have been interviewed to ask them regarding the effectiveness of the video. Also, the main target audiences are children, pregnant women and people who suffer from chronic diseases as they are most likely to get anaemia. In conclusion, suffering from anaemia is not an issue that can be taken lightly by everyone in this world, instead, people should be concerned about this matter.

Keywords: Management of diet; iron-deficiency anaemia; iron-rich food

INTRODUCTION

Anaemia which is a common blood related disease that can occur to those with deficiency of healthy red blood cells. This unhealthy condition of red blood cells results in carrying inefficient amounts of oxygen to the human's organs. There are many types of anaemia, but the most common type is iron-deficiency anaemia [1]. Iron deficiency anaemia is characterised by microcytic and hypochromic red cells on the peripheral smear. The patient frequently complains of generalised symptoms including weariness and dyspnea with effort. It has been discovered that patients with iron deficient anaemia experience more adverse events and a longer hospital stay [2]. In Malaysia, National Health and Morbidity Survey 2019 reported the frequency of cases among Malaysians is as much as 21.3% [3].

Blood loss is frequently to blame for being the cause of anaemia. Low blood iron levels brought on by blood loss might result in anaemia. In order to keep the blood vessels full as the body loses blood, the body takes water from tissues outside of the bloodstream. The blood becomes more water-diluted as a result, which lowers the red blood cells count [4]. An individual is described as being anaemic when they exhibit anemia-related symptoms. Anaemia has diverse effects on different people. For example, in children, anaemia may cause delayed motor skill development and learning difficulties [5].

Foods high in heme and non-heme iron, such as meat, poultry, seafood, beans, and green, leafy vegetables, should be included in an iron deficiency anaemia diet plan. Additionally, it will outline meals that facilitate iron absorption and warn against those that can obstruct it [6]. Heme iron can be absorbed up to 30% in the human body, however non-heme iron absorption varies from 1% to 10% depending on other nutrients and is substantially less bioavailable [7]. The majority of anaemic individuals are instructed to take 150–200 milligrams of iron daily [8].

Anaemia has negative consequences on a person's quality of life and productivity at work in addition to their physical health [9]. Therefore, we would like to provide the information regarding ways to reduce and prevent the occurrence of anaemia cases. To be more specific, we are focusing on the healthy diets that must be taken which consist of iron-rich food. We provide a campaign on taking food that majorly consists of iron. Unfortunately, only a few of people know the types of food that is iron-rich. Our project conveys the scenario that portrays the situation of an individual that is diagnosed with this specific type of anaemia; iron-deficiency anaemia. We also mention the types of food from leafy greens to nuts and seeds. Some of the food types are uncommon as the fact that meat is well known as one of the biggest sources of iron. Hence, from this project, we are hoping that people's knowledge can be increased as they will learn some more types of food that supply iron for human's body.

INNOVATION DEVELOPMENT

The innovation chosen by our team is a campaign through video production on anaemia. The video specifies a dietary intake programme for anaemia patients. It is produced to spread awareness about the fundamental foods that should be included in an anaemic patient's diet. In the video, we gave a thorough yet simple explanation of the dietary intake of an anaemic patient to ensure that it is easy to receive by a wide range of ages. We provide information regarding the regarding anaemia, symptoms of anaemia, food dietary intake for anaemic patients. The information used in the video is taken from reliable sources to avoid making false statements that could be misleading. The recording session included all five members, and each member acted according to their part. The recorded video was then proceeded to editing by using "vllo".



Figure 1: Objective of this program

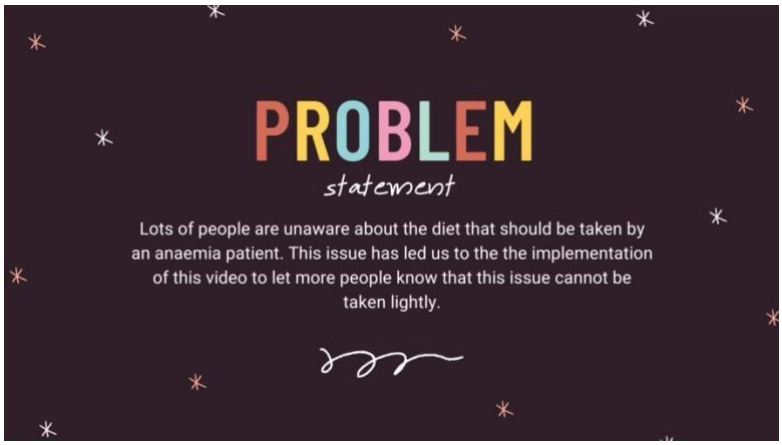


Figure 2: Problem statement



Figure 3: Commercialization potential of this video



Figure 4: Introduction of anaemia



Figure 5: Symptoms of anaemia



Figure 6: The dietary intake for anaemic patients



Figure 7: Other ways to maintain health to reduce risk of getting anaemia

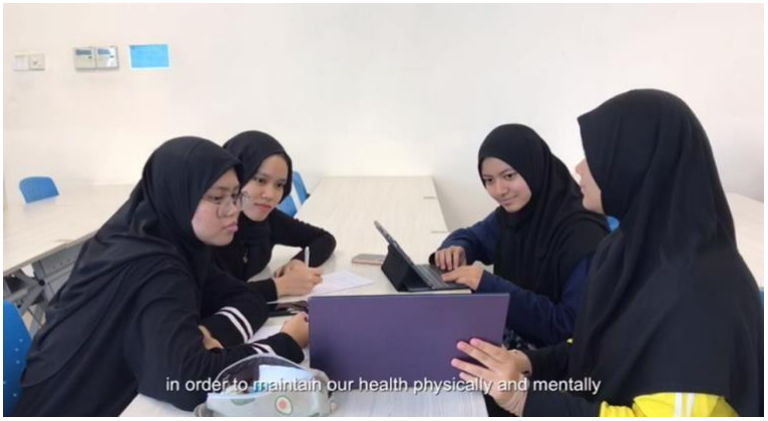


Figure 8: Conclusion part

COMMERCIAL POTENTIAL

We propose to put our video on YouTube under health channel to assess the commercial potential of this video. This way of advertising our video will attract many viewers including international viewers to watch the video published. Besides that, we will also put our video on other social media platforms like Instagram, TikTok and Facebook to reach more viewers and let them know about anaemia. We believe that this video can be the solutions to anaemia patients because there is evidence that many conditions can be treated without using medication. This is what brings us to make a video production on anaemia that shows the dietary intervention to cure anaemia. This video is focusing on anaemia patients to control their dietary intake by taking in iron-rich foods that was provided in this video.

DISCUSSION

A qualitative survey has been conducted among 5 students of Centre of Foundation Studies, UiTM. This survey was carried out to help with future planning by providing opinions from the anaemic patient and others. Two of them are anaemic patients while three of them are not an anaemic patient. From the survey, we got positive feedback from the respondents. Fatihah, a student of Foundation of Law KPTM, stated that, “As a patient of iron-deficiency anaemia, I find that it is nice and informative content since it provides new knowledge in a crystal clear and interesting way. The presentation is fun and creative too with an entertaining background sound, which made me interested in watching the video till the end. Overall, it is a useful and most importantly enjoyable one.” Besides, an anaemic patient, Adilah, a student of TESL said, “This video is interesting and very well made. Indeed, I have experienced all the symptoms that are stated in the video. I can confirm that the diet stated in the video is accurate.” The other three of the respondents said that the video is simple, yet informative and fun to watch. This positive feedback about the video will have a potential to attract more viewers from all ages to learn more about anaemic patients’ diet.

CONCLUSION

In conclusion, we manage to produce a short, informative and engaging video that specifies a dietary intake programme for anaemic patients based on our own creativity as a method on

spreading health awareness. By doing this, it could draw in more people as we convey our information in an entertaining way. As a suggestion, we think that organizing an event that sponsored walking, cycling and jogging can encourage communities to practice a healthy lifestyle by doing some physical activities. Besides, social media is quite significant today as people including adults and teenagers has been use it every day. News spread quickly, and a post going viral can happen in just a few minutes. It is an effective strategy for encouraging more people to raise health awareness. Therefore, we hope that we can help them realize on how important to practice a healthy diet and how it might motivate them to take good care of their health.

ACKNOWLEDGEMENT

This campaign would not have been possible without the thorough guidance and insights of Dr. Tengku Norbaya on the project. As our teacher, she never fails to give us new opportunities to learn new knowledge and experiences. We would also like to thank our parents for being our core support system during our hardships. Their involvement gives us strength to continue pursuing and striving for success. We are grateful to all parties who have contributed to our project with their extensive knowledge, criticism, and new outlook. It has broadened our perspective and assisted in the completion of our project. health.

REFERENCES

[1] National Heart, Lung, and Blood Institute (March 24, 2022). *Iron-Deficiency Anemia.* nhlbi.nih.gov/health-topics/iron-deficiency-anemia
[2] Matthew J. Warner & Muhammad T. Kamran (2022). *Iron Deficiency Anemia.* https://www.ncbi.nlm.nih.gov/books/NBK448065/
[3] National Health and Morbidity Survey 2019, Non-communicable diseases, healthcare demand, and health literacy, 2019. https://www.ukm.my/mycohort/ms/news/anemia-kenali-faktor-risiko/
[4] Peter Lam (January 3, 2023). *What to know about anemia.* https://www.medicalnewstoday.com/articles/158800#causes
[5] Cleveland Clinic (2022). *Anemia.* https://my.clevelandclinic.org/health/diseases/3929-anemia
[6] Bethany Cadman (January 10, 2023). *Foods and meal plans for iron deficiency.* https://www.medicalnewstoday.com/articles/322336#:~:text=A%20diet%20plan%20for%20ir on,may%20interfere%20with%20this%20process.
[7] Dominika Skolmowska et.al (2022). *Effectiveness of Dietary Interventions to Treat Iron- Deficiency Anemia in Women: A Systematic Review of Randomized Controlled Trials.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9268692/
[8] Dr. Nikita Toshi (April 25, 2023). 8 Types of Food That Can Help You Fight Anaemia! https://pharmeasy.in/blog/foods-good-for-anemia/

Tourette Syndrome: Perception and Adaptation within Society

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ABSTRACT

Tourette syndrome, TS is a neurological disorder that causes people to have sudden involuntary and unwanted movements or rapid vocal sounds which are known as tics [1]. TS exact cause is still yet to be known however scientists state that maybe genetic and environmental factors could be the cause. The disorders could occur to all people but men are more likely to have them than females [1]. The objective of this study is to conduct a campaign that helps to create awareness of tourette syndrome in our society by introducing them with what is tourette syndrome. This is because most people are not aware of this disease and some people with tourette syndrome do not receive appropriate care in the society. Thus, it could increase the public's knowledge about this disorder. This campaign was designed using a five minutes informative video which contains tourette syndrome information; causes of Tourette syndrome, symptoms, treatment and how to prevent it from getting worse. As a platform to share this video to the society, Youtube platform was used. Besides, a google form also was attached together in Youtube to see the viewers responses about TS. From the survey, out of 19 people from 25 are aware about Tourette syndrome even before watching the video, however most of them do not know what the causes, symptoms, treatment and way to prevent it. To conclude, the Tourette syndrome information has successfully been proposed to the society via this campaign therefore people will be more aware and concerned about this disease in the future.

Keywords: TS; neurological disorder; awareness

INTRODUCTION

The majority of individuals in the world are unconcerned about Tourette syndrome. The issue that we're all dealing with is how little people in society actually know about these illnesses. A video educating society about diseases is an innovation. The goal of this study is to produce a cutting-edge educational video on Tourette syndrome in order to raise awareness among the general public. The innovation motivation of this project is to include informative content such as the causes, symptoms, treatment, and prevention of Tourette syndrome. The details about these diseases will be discussed further in our report below.

Tourette syndrome (TS) is a neurological condition that results in tics, which are brief, uncontrollable, and unpleasant movements or fast vocalisations [3]. Tics are sudden, repetitive twitches, motions, or noises. There are two types of tics: motor and vocal. Body motions are known as motor tics. The sounds a person creates with their voice are called vocal tics. Tics can also be straightforward or intricate. Simple tics, such as squinting the eyelids or sniffing, only affect a few body areas. Complex tics can involve multiple bodily parts and can follow a pattern, such as bobbing the head while jerking an arm, followed by springing up [3]. In addition, more

boys than girls are affected by tourette syndrome, and early adolescence is usually when TS patients experience the worst tic symptoms, but by late adolescence or early adulthood, tics usually diminish and become under control [1].

Next, the most commonly co-occurring illnesses along with TS are anxiety, obsessive-compulsive disorder or behaviours (OCD), and attention deficit hyperactivity disorder (ADHD).[1] Although TS students frequently perform well in a typical classroom setting, other factors such as ADHD, learning difficulties, obsessive-compulsive symptoms, and frequent tics can seriously hamper academic achievement or social adjustment. Children with Tourette syndrome can demonstrate difficulties with peer and adult social relationships. One of the possible signs of impaired social skills with Tourette syndrome is difficulty initiating peer engagement [2].

INNOVATION DEVELOPMENT

In order to spread awareness about this disease to the public, we have produced a video that explains Tourette syndrome. This video has some details on the causes, symptoms, treatment for the disease and some prevention that can be done. To produce this video we have done a lot of research about this disease through Google, official health websites and also lecturers. Once we gained the information from various platforms, we did some discussion among the group members to make sure that each of us had accurate information about Tourette syndrome.

The video we have produced as shown in Figure 1 consists of some parts that provide some information regarding this disease. Society also can refer to this video to know what to do when there is someone who has this disease. Then, we upload it on one of our group member YouTube channels which is ‘aleeyalts’ for the public to watch. Besides that, we also made a survey regarding Tourette syndrome by using Google Form. We have attached the link of the survey at the description box under the video we have posted so that the viewer can easily access it. In the survey we have prepared a few questions such as ‘Do you know the causes of Tourette syndrome?’ for the viewers so that we can know their level of understanding about Tourette syndrome before and after watching our video as shown in Chart 1 and Chart 2, 1 indicates the lowest level of understanding while 3 is the highest. As we can see from the chart, we can know that before watching the video 48 % of the respondent did not know what is the causes for this disease but after watching it 60 % of them have knew the causes of the syndrome, this shows that our video is able to help public understand Tourette syndrome better. Next, we shared the link of the video and the survey through social media such as WhatsApp as shown in Figure 2, Instagram and Telegram. We shared the links to our family, friends and also students in UiTM Dengkil. Lastly, we collected all the information based on the responses from our viewers that have answered our surveys.

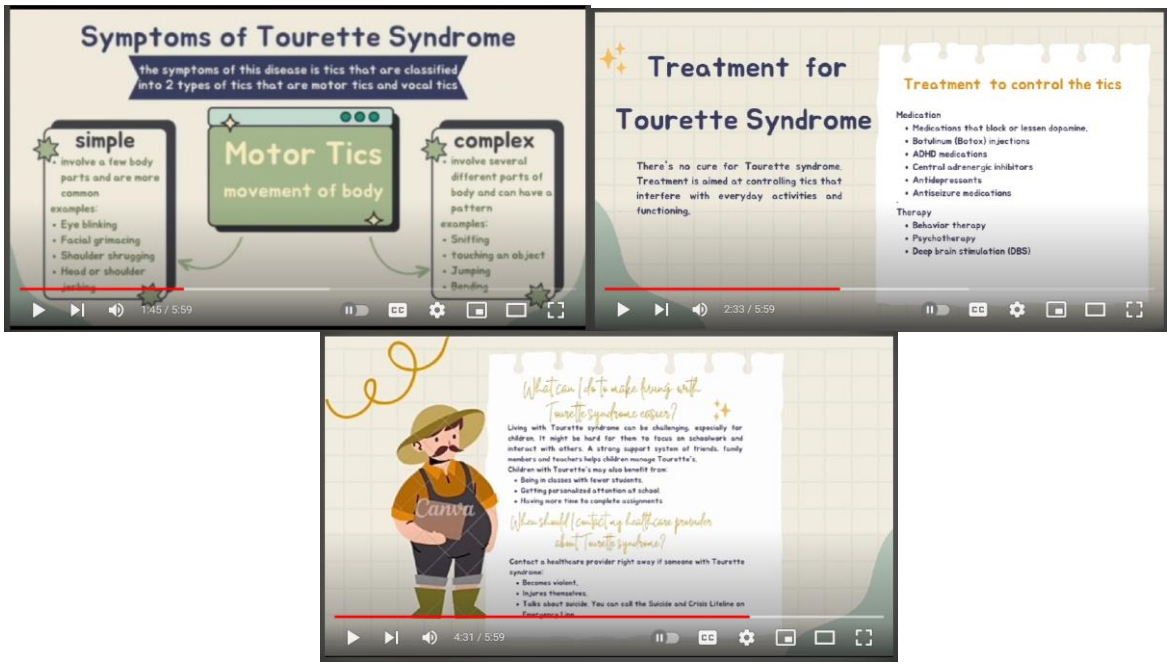


Figure 1: Our Tourette syndrome video

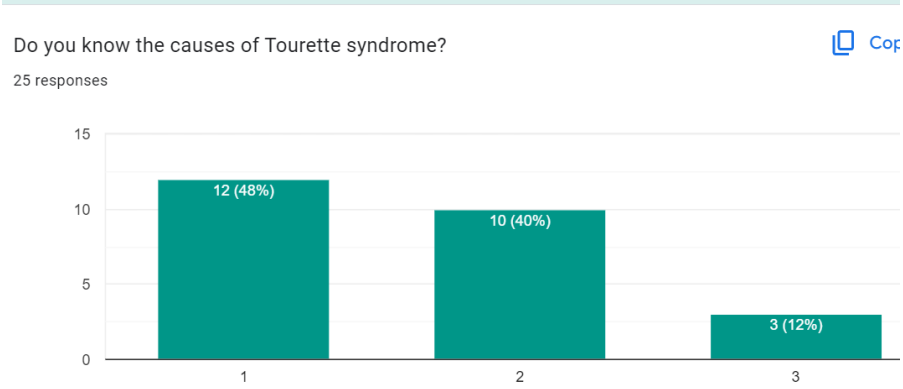


Chart 1: Before watching our video

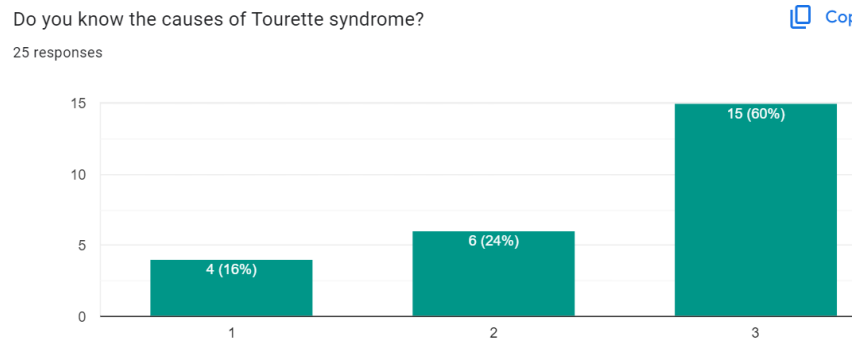


Chart 2: After watching our video

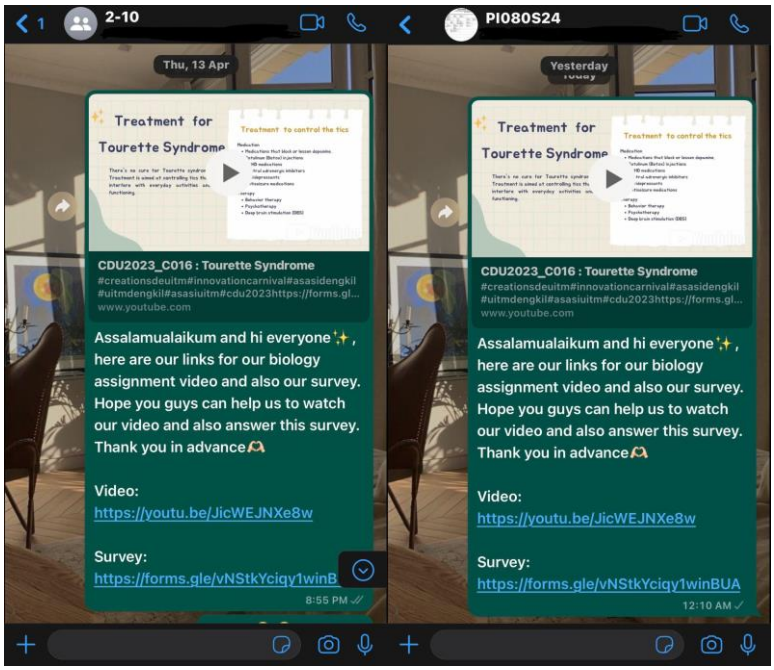


Figure 2: Sharing links at social media

COMMERCIAL POTENTIAL

We did this kind of approach to give people awareness and exposure about people who suffered from tourettes. We collected the data of people's knowledge about tourettes by giving them some likert scale questions to evaluate themselves. This is because we would like to interpret whether they have knowledge about this disease or not. The approach of the product is to give awareness and information about this disease to people who have zero to bare minimum knowledge about tourettes. In addition, the product is most likely to be launched during Tourettes Syndrome Awareness Month which is on May 15 to June 15 [4]. So, it is a great step to provide additional information to the people about this disease. Furthermore, people who suffered from this disease most likely would feel reserved and appreciated. It also gives them a chance to get properly treated and cared for by the people around them. Due to this approach, probably in the near future the technology to create the cure for this disease.

With the information we get from the respondents we decided to create a video on a platform called Canva which we create using templates and voiceover from the members of the group. This can give people more understanding about Tourette's disease because we included causes, symptoms, treatments and preventions. This will give people more exposure on how they should treat people with this disease as they know about the disease inside and out.

CONCLUSION

In conclusion, the tics can be controlled with medicines even though there is no known cure for Tourette syndrome. Numerous Tourette syndrome sufferers have tics that do not interfere with their everyday activities and are hence not in need of therapy. If tics do, however, result in discomfort or harm, disruption of academic, professional, or social life, or stress, medicines and behavioural therapies are available. However, the objective to spread awareness about these diseases was achieved. This is proved by the result of the google form shown. Many people had looked at the video we created. They showed a good response about this disease. Our hope for

the future is that society can be more alert and sensitive about these diseases in our daily life as we should never look down upon this disease.

ACKNOWLEDGEMENT

First and foremost, we would like to express our gratitude to the Almighty God, for His blessings throughout this assignment. We were able to complete this assignment successfully with His blessings. Next, we would like to thank our lecturer, Madam Tengku Norbaya Binti Tengku Azhar, for all of her assistance in helping us complete this assignment. We were grateful because she helped us with sincerity which also became an inspiration for us to finish this assignment as perfect as we could. She gave us amazing advice and direction from the beginning of the process to the very end. It is an honour for us to say that learning under her guidance was an amazing experience.

Besides, we would also like to express our gratitude towards our family, who support us in completing this assignment. Without their prayers, love, caring and sacrifices, we might never be able to complete this report successfully. This assignment which we have successfully finished required much guidance and help from many people around us and we were very fortunate to have all those assistance throughout completion of our assignment. We would never forget to thank them, especially our teammates who guide us whenever we need it. We are grateful that we could complete this assignment within the time given. This assignment could never meet an end without effort and cooperation from all the group members.

REFERENCES

[1] *Tourette syndrome* (nd) *National Institute of Neurological Disorders and Stroke*. U.S. Department of Health and Human Services. Retrieved from https://www.ninds.nih.gov/health-information/disorders/tourette-syndrome

[2] Simpson, H. (2015) *Social concerns related to Tourette syndrome " Movement disorders & neurorestoration program Norman Fixel Institute for Neurological Diseases " UF health " university of Florida, UF Health monogram*. Retrieved from https://movementdisorders.ufhealth.org/2015/05/04/social-concerns-related-to-tourette-syndrome/

[3] *What is Tourette syndrome?* (2022) *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/ncbddd/tourette/facts.html

[4] Tourette Association of America. (2022, September 13). Retrieved from https://tourette.org/about-us/raise-awareness/

Lost Voices of Palestine: Amplifying the Call of Freedom

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ABSTRACT

The Israel-Palestine conflict has been ongoing for decades, resulting in countless human rights violations and loss of lives. The general public, however, is unaware of the situation and has little knowledge of it, which prevents them from taking any action to address it. To address this issue, the Lost Voices of Palestine project was created as a social innovation platform with the goal of promoting understanding and raising awareness, particularly among pre-university students. One of the major goals of the Lost Voices of Palestine project is to serve as a platform for educating society about the ongoing war crimes between Palestine and Israel and encourage people to take action to help solve the issue. This will be achieved by organising various awareness-raising activities or exhibitions and using social media and multimedia platforms. Additionally, the project aims to provide accurate and reliable information to help people better understand the issue, its history and its current state, for people to take action and contribute to resolving the conflict. Despite the project's lack of a commercial focus, it has the potential to attract support and funding from those who care deeply about social justice and human rights. The project may also open up chances for collaboration and partnerships that could result in other projects and initiatives by cultivating a robust and active community. Overall, the Lost Voices of Palestine project is a social innovation platform that seeks to increase knowledge about the Israel-Palestine conflict and inspire individuals, particularly pre-university students, to take action and contribute to its resolution.

Keywords: Israel-Palestine conflict; social innovation; awareness; platform

INTRODUCTION

The Israel-Palestine conflict is a prolonged issue that has caused significant human rights violations and loss of life. A complicated political and territorial dispute stemming from the conflict has not yet been settled [1]. Due to a lack of understanding and awareness, the public as a whole has been prevented from taking any substantial action to address the issue. This has led to a continued cycle of violence and suffering for the people in that region. Additionally, social media has evolved into a tool for the public to stay informed about global issues in the twenty-first century, but it has also contributed to a bad habit of mindlessly reposting and sharing posts without actually understanding the situation [2].

The Lost Voices of Palestine; Amplifying the Call of Freedom is a social innovation project that aims to increase awareness about the Israel-Palestine conflict and inspire individuals, particularly pre-university students, to take action and contribute to its resolution. Social innovation is a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues

primarily to society as a whole rather than private individuals [3]. The project was developed as a response to the issue of mindless sharing and reposting on social media without really understanding the conflict. The primary objective of this project's innovation is to address the issue of Malaysian society, especially pre-university students, blindly uploading and reposting on social media about the Israel-Palestine conflict. Despite being aware of the issue, many people tend to ignore it without making any serious efforts to help. To motivate people to take action and assist in resolving the conflict, this project seeks to alter that perspective by offering accurate and reliable information about the war and its effects on Palestinians.

The project was introduced at the Contemporary Global and Legal Issues Exhibition 2023 (CoGLIEx) organised by the Department of Law, UiTM Dengkil on 11 March 2023. A booth was set up to spread awareness among pre-university students in UiTM Dengkil about the problem and how it affects Palestinians through imaginative posters and a LinkTree website. The project hopes to encourage more people to take action and contribute to the conflict's settlement by fostering a greater understanding of the conflict's history and effects.



Figure 1: Lost Voices of Palestine's Project at CoGLIeX 2023

INNOVATION DEVELOPMENT

The innovative development of the Lost Voices of Palestine project lies in its approach to addressing the ongoing Israel-Palestine conflict. Rather than relying on traditional methods of raising awareness, such as lectures or presentations, the project leverages social media and multimedia platforms to provide accurate and reliable information to individuals, particularly pre-university students, and inspire them to take action. The project aims to improve awareness of the problem, foster understanding, and motivate society to take action to resolve it by utilising social innovation as a tool.

The project team created an eye-catching and educational poster that exposes the issue and its effects on Palestinians using Canva, a free graphic design tool. The poster was put on display at the CoGLIEx exhibition to raise awareness among UiTM Dengkil's pre-university students. The group also developed a website called LinkTree that links to many sources of data and information concerning the conflict. The website has an educational poster, a daily Instagram

news feed on Palestine, and a podcast on Spotify for people who would rather listen than read or view videos. Another component of this project's innovative development was its participation in the CoGLIEx exhibition. The team was able to disseminate awareness of the ongoing violence among students and visitors by setting up a booth and displaying their poster and website.

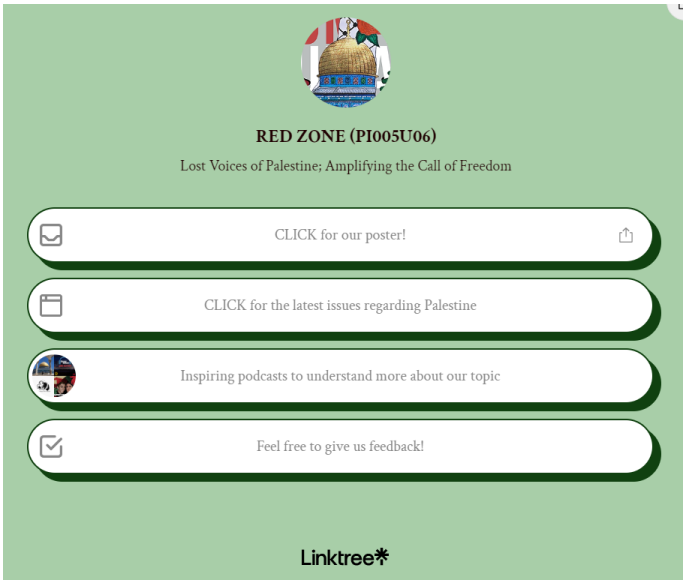


Figure 2: LinkTree Website that provides reliable information on the Israeli-Palestinian conflict

In conclusion, the project employed both online and offline strategies to increase the impact of raising awareness of the Israel-Palestine conflict. People were able to engage with the project more easily and take action to help end the violence.

COMMERCIAL POTENTIAL

Relevance of the invention

The Lost Voices of Palestine project has great relevance in addressing the related problem of lack of awareness and support for the issue of Palestine. The project intends to develop a campaign and a website that disseminates information and knowledge about the dispute, which can assist in empowering the community to take charge of the problem and contribute to finding solutions. This may contribute to raising public awareness of the significance of the problem and the difficulties people in the area suffer, which may ultimately lead to support for nonviolent protests in favour of Palestine's rights. Moreover, the project contributes to new knowledge and technology by creating a website that serves as a reliable source of information for people who want to learn more about the conflict. People can access a variety of news sources and articles about the Palestine issue through this website. A fuller grasp of the history, culture, and politics of that area can also be gained from this website. The project also makes use of digital communication technologies like social media to reach a larger audience and amplify the campaign's message.

By fostering peace and nonviolent actions to support the rights of Palestine, the Lost Voices of Palestine project also benefits society and the environment. The campaign presents facts and real-life stories about life in Palestine, which help increase empathy and

solidarity among the public towards the people in that region. The general public can contribute to making a significant impact in the lives of people in the region by taking peaceful activities like organising fundraisers to aid conflict victims or asking the government to pay more attention to the issue. Additionally, the project aims to foster a more positive and cohesive society by providing opportunities for the community to participate and get involved in this campaign, which can help build solidarity and positive relationships among them.

The market needs and market potential

While the project is primarily focused on raising awareness and inspiring action towards the Israel-Palestine conflict, there may be some commercial potential in the innovative methods used to spread awareness. The use of a LinkTree website with curated information and links, as well as a podcast on Spotify, could potentially be used for other social causes or marketing purposes. Additionally, the creative posters created on Canva could be sold as merchandise to raise money for charitable organisations or used for other awareness campaigns.



Figure 3: Poster awareness

Additionally, people and organisations interested in social justice, human rights, and conflict resolution may be included in the target market for this project. This target market can be reached through the project's website and social media platforms, and partnerships with pertinent organisations can aid in extending the project's reach. The project also has the potential to generate revenue through partnerships with organizations that share its objectives and principles. For instance, the project could partner with NGOs that provide humanitarian aid to the Palestinian people and receive a percentage of donations made through the website. The project might also offer educational resources and workshops for a fee to interested parties, such as schools or organizations.

However, it is crucial to note that the project’s primary focus is not on commercial gain, but rather on creating positive social impact.

CONCLUSION

In conclusion, the Lost Voices of Palestine project has been successful in raising public awareness of the ongoing conflict between Palestine and Israel and in motivating people to take appropriate action to help resolve the problems. The positive feedback received from people who visited the booth and website has shown a real need for this kind of social innovation to address important issues affecting people's lives. As students, the project has provided an opportunity to contribute to society by creating a platform that educates people about the issue and empowers them to take peaceful actions to support the rights of Palestine. Moving forward, the project plans to continue developing by collaborating with organisations that send funds to those in need in Palestine and selling merchandise to raise funds for the cause. Overall, the Lost Voices of Palestine project has the potential to make a real difference in the lives of people in the region, and the efforts will contribute to a more peaceful and just world for everyone.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the Department of Law, UiTM Kampus Dengkil for organizing the Contemporary Global and Legal Issues Exhibition 2023 (CoGLIEx), which provided us with a head start in launching our social innovation project, Lost Voices of Palestine. We would also like to thank our advisor, and supporters for their guidance and encouragement throughout the project. Without their support, our project would not have been possible.

REFERENCES

[1] n.a. (January 18, 2023). With 2022 Deadliest Year in Israel-Palestine Conflict, Reversing Violent Trends Must Be International Priority, Middle East Coordinator Tells Security Council. United Nations. Retrieved on 28th April 2023 from https://press.un.org/en/2023/sc15179.doc.htm

[2] Dizikes, P. (September 24, 2020). Why social media has changed the world- and how to fix it. MIT News. Retrieved on 28th April 2023 from https://news.mit.edu/2020/hype-machine-book-aral-0924

[3] Phills, J. A., Deiglmeier, K., & Miller, D. T. (2008). Rediscovering social innovation. Stanford Social Innovation Review, 6(4), 34-43.

[4] n.a. (2021). What led to the most recent Israel Palestine Escalation? Al-Jazeera. Retrieved on 1st March 2023 from https://www.aljazeera.com/news/2021/5/12/what-lead-up-to-most-recent-israel-palestine-escalation

[5] International Crisis Group. (2021). The Israel-Palestine Crisis: Causes, Consequences, Portents. Retrieved on 24th February 2023 from https://www.crisisgroup.org/middle-east-north-africa/eastern-mediterranean/israelpalestine/israel-palestine-crisis-causes-consequences-portents.

[6] Katz, M. (2013). The Arab Spring and the Israeli/Palestinian conflict: international implications. Global Affairs. Retrieved on 23rd February 2023 from https://eng.globalaffairs.ru/articles/the-arab-spring-and-the-israeli-palestinian-conflict-international-implications/

[7] Bassiouni, M. C. (1992). Crimes Against Humanity in International Criminal Law. Martinus Nijhoff Publishers.

[8] Schabas, W. (2012). Unimaginable Atrocities – Justice, Politics, and Rights at the War Crimes Tribunals. Oxford University Press.

Plants bASed highlighTER peN (PASTERN)

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ABSTRACT

Highlighter pens serve as vital tools for office and education to mark important information and concepts for memory. Most highlighter kinds use liquid ink and function similarly to felt-tip pens or markers. However, conventional highlighters may be harmful to contend with because they consist of artificial colours created chemically such as fluorescein, pyranine, triphenylmethane, rhodamine, xanthene, and coumarin. The main objective of Plants bASed highlighTER peN (PASTERN) is to create non-toxic highlighter using natural colouring that has been extracted from plant base. For the innovation development of the product: turmeric, butterfly pea flower, and coffee powder have been used as colouring agents and become excellent replacements for the toxic substances found within conventional highlighter pens. Each plant base extract's components have been identified using the retention factor (Rf) in chromatography. While butterfly pea flowers had a higher Rf value and less polarity, turmeric extract had a lower Rf value and was more polar. Moreover, caffeine exhibited a more polar, concentrated solution behaviour, and lower Rf value. Plant base extract can be utilized as a natural colouring agent in highlighter pens by employing each aspect that was examined. By doing so, hope PASTERN will establish itself as a non-toxic, environmentally friendly stationery option in the future.

Keywords: Plants based; highlighter pen; eco-friendly; non-toxic

INTRODUCTION

Highlighter pens have a particular ink made to be seen clearly when writing over already-existing text or writing. This will enable us to draw attention to any textual passages that are particularly compelling or important. The study regarding chemicals as colouring agents in highlighter pens still lacks information regarding the chemical contained within synthetic and natural colouring. Most highlighter kinds use liquid ink and function similarly to felt-tip pens or markers. However, conventional highlighters may be harmful to contend with because they consist of artificial colours created chemically such as fluorescein, pyranine, triphenylmethane, rhodamine, xanthene, and coumarin.

The main objective of Plants bASed highlighTER peN (PASTERN) is to create non-toxic highlighter using natural colouring that has been extracted from the plant base. While in the beverage industry, the study of food colouring is important as people are more attracted to colourful food which gives the most significant sensory attribute [1,2]. Thus, the study on the preparation of colouring agents for plants-based highlighter pens (PASTERN) will let us know the chemical substances for each type of colour that can contribute to the work, educational, and beverage industry.

MATERIAL AND METHODS

Sample Preparation

Sample preparation is the fundamental stage in preparing colouring agents for plants-based highlighter pens (PASTERN). For the innovation development of the product: turmeric, butterfly pea flower, and coffee powder have been used as colouring agents and become excellent replacements for the toxic substances found within conventional highlighter pens.

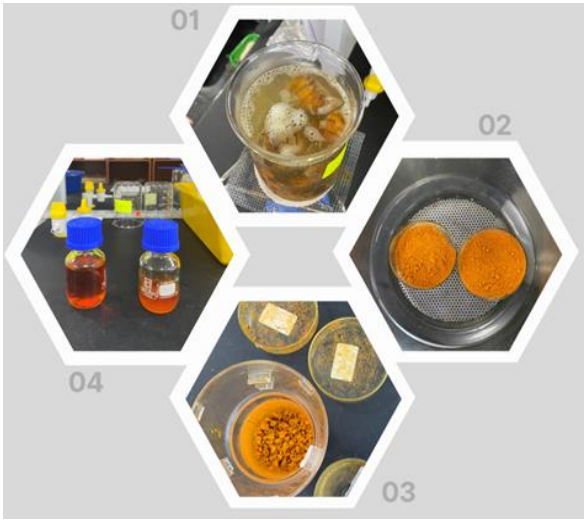


Figure 1: Turmeric extraction

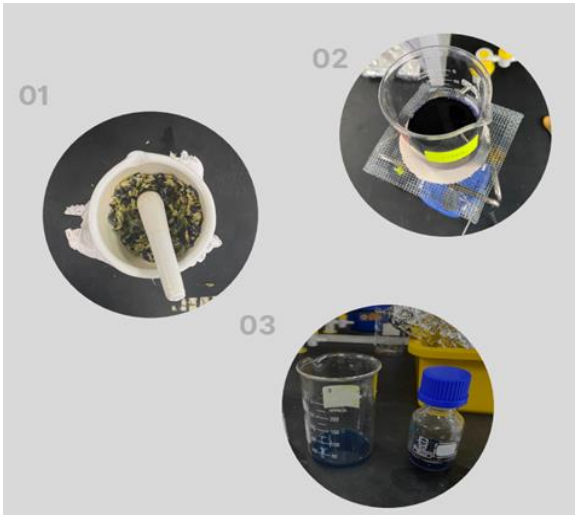


Figure 2: Butterfly-pea flower extraction

The colouring agent was prepared using the extracted of turmeric as in Figure 1. To begin with, the ingredients were boiled in water by using a beaker, Bunsen burner, clay triangle and wire gauze. Next, cut it into small pieces and dried it in a food lab dehydrator to preserve this turmeric by removing the moisture. All dehydrated foods are then ground by using the dry blender to give a deep orange-yellow powder and placed in an airtight food storage container and stored in a cool, dry place. After that, the combination of 20 ml of water and 30 g of ground ingredients was boiled for 2 hours. 50% of ethanol was added to the boiled mixture and left for a day. The final step for extraction was to filter the brewed liquid using filter paper to separate fine solid particles from the liquid. Then, it is ready to undergo the chromatography test part.

For the colouring agent from butterfly-pea flower, the extraction is shown in Figure 2. To begin with, collect the plant materials and clean the samples. Next, dried it by using a food dehydrator and then crushed it. After that, dissolved it in boiling water for 2 hours for quick extraction. At the end of 2 hours, the total colour was extracted [3]. Leave it for a night and after that remove the flower. Use filter paper to separate fine solid particles from liquids. Then, it is ready to undergo the chromatography test part.

The next colouring agent was prepared using the extracted of caffeine as in Figure 3. To begin with, 9 grams of coffee powder was dissolved in 50 ml of boiling water for 2 hours. Then, filter it by using filter paper to separate the fine solid particles from the liquid ones.

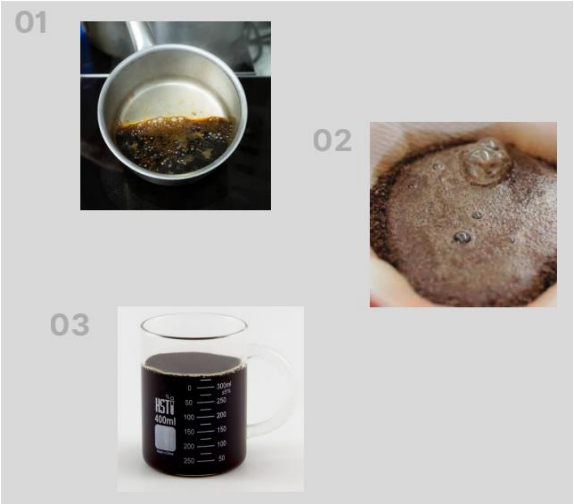


Figure 3: Caffeine extraction

Chromatography Test

All the plant-based extracts (turmeric, butterfly-pea flower, and coffee) have undergone the chromatography test. Chromatography is a technique that is used to separate and identify components of a mixture. In this study, the main objective of the chromatography test is to measure and calculate the Rf value and determine the polarity of the sample as in the step shown in Figure 4.1 until Figure 4.4.



Figure 4.1 Take a strip of chromatography paper and make a line around 1-2cm.



Figure 4.2 Drop the colour at the labelled line.



Figure 4.3 Developer solution (isopropyl) should be poured into the beaker and let rise.



Figure 4.4 Label and calculate the retention value.

RESULTS AND DISCUSSION

In this study, the calculation of retention value (Rf value) has been used to determine the polarity of the sample extractions. As in Table 4, the butterfly-pea flower shows Rf value of 0.95 which same as the expected result from the previous study [4]. Based on the outcome, it is feasible to say that the chemical content and the polarity of the butterfly-pea flower extraction were non or less polar. In addition, high retention factor value means strong interaction between the compound of interest and the surface. Dye extraction from turmeric shows a colour with Rf value of 0.39 which same as the expected result from the previous study [5]. During the process, all the components of the mixture move slower from the baseline so the Rf value (retention value) of the solvent will be lower during the chromatography process. It can be concluded that the chemical contains, and the polarity of the turmeric extraction was higher.

The last dye extraction was from coffee. It shows a colour with Rf value of 0.36 which is different from the expected result from the previous study [6]. In the previous study, the result was 0.80. The reason why the result of Rf value is different from the expected result is that the amount of solute that has been used is more than the solvent compared to the expected result. Hence, from the data obtained, all the components of the mixture travel slower so the Rf value of the solvent will be lower during the chromatography process. From the result obtained, it can be concluded that the chemical content and the polarity of the caffeine extraction were higher while the Rf value was lower. A low value of the retention factor means the interaction between the compound of interest and the surface is weak.

Table 4: Rf value of paper chromatography for three different extractions

Natural Dyes Extract	Rf Value
Turmeric	0.39
Butterfly-pea flower	0.95
Caffeine	0.36

CONCLUSION

Plant-based extraction is available to use in various industries either work, educational, or beverage industry. In this study, the extraction of natural colouring has been implemented in highlighter pens. Its cost-effective strategy, free from harmful chemicals and last longer made PASTERN will establish itself as a non-toxic, environmentally friendly stationery option in the future.

REFERENCES

[1] Gandhi, N., (2019). Food Colours and their Chemistry. Journal of Agricultural Engineering and Food Technology, Volume 6 (Issue 2), Page Number (129-132)
[2] Dey, S., & Nagababu, B. (2022). Applications of food colour and bio-presentative in the food and its effect on the human health. Journal of Food Chemistry Advances, Volume 1(Issue 3), Page Number (172-174).

[3] R.Ravindran, D., & Bharathithasan, M., et al. (2020). Chemical composition of flower extracts from *Clitoria Ternatea.*
[4] Omokpariola, D. O. (2019). Group Practical and Term-Paper on "Paper Chromatography". August 2019, https://doi.org/10.13140/RG.2.2.28961.33121
[5] Khan, S., & Khamar, D. (2019). Development and Standardization of Turmeric Cream HPTLC. International Journal of Biomedical and Advance Research, Volume 1(Issue 4), Page Number (109-116).
[6] Abidi, S., & Gilani, Umer., et al. (2020). Extraction and analysis of caffeine from various brands of tea leaves marketed in Pakistan. Journal of Pharmacognosy and Phytochemistry. Volume 9 (Issue 1), Page Number (9-10).
[7] Fortunado, I., (2019). The seven primary colours. International Journal of Advanced Education and Research, Volume 4 (Issue 4), Page Number (13-14).
[8] L. Escuder-Gilabert, J.M. Bermúdez-Saldaña, R.M. Villanueva-Camañas, M.J. Medina-Hernández, S. Sagrado (2004). Reliability of the retention factor estimations in liquid chromatography. Journal of Chromatography A. Volume 1033 (Issue 2) Page Number (247-255)

Anti-Mess Baby Bib

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ABSTRACT

In this fast-paced era, parents still face many challenges in caring for children. To foster innovation for a global community, the Anti-Mess Baby Bib product was created based on high demand by parents who still have small children between 4 months and three years old. This innovation aims to facilitate children's learning process by using material improvements such as synthetic fabric, plates, and bowls made of bamboo with various shapes in one product. This design suits flat surfaces such as cement, plastic, walls and even tiles. With the help of a suction system under the surface of the plate in the bowl, no movement will cause action on the product. After using it once, parents rinse the bowl or plate with the 1-meter cloth. With just one lift, everything is easy without taking a long time to clean up. Along with the growing trend of 'baby-led weaning' (BLW), where young children are taught to be independent while eating, parents demand an easier way to practice this method. With this innovation, parents can practice BLW without worrying about food waste. Through BLW, small children gain the confidence to be independent at the dining table while strengthening muscles and improving psychomotor skills.

Keywords: Baby bib; baby-led weaning; children; innovation; psychomotor

INTRODUCTION

Since the advent of Islam, cleanliness has been a priority for all individuals. This is explained in a hadith of the Prophet SAW: "Purification is one of the characteristics of faith." (Hadith of Muslim History). This hadith explains that keeping clean is one of the personality traits of a Muslim. Maintaining cleanliness is not only about the environment and clothes; this care means cleanliness in terms of spirituality, mind, body, and our environment [1]. Apart from that, taking care of cleanliness is very important in our lives because Allah loves people who take care of cleanliness. This can be seen in the words of Rasulullah SAW, "Clean everything as much as you can. Verily, Allah Ta'ala built this Islam based on cleanliness, and no one will enter heaven unless everyone is clean." (HR Ath-Thabrani). Based on this hadith, cleanliness is one of the foundations of change in the Islamic religion [2]. God loves people who prioritize cleanliness themselves. Therefore, the importance of optimal environmental care must be internalized.

Until now, most of the new products created also have anti-dirty and eco-friendly criteria. This product is specially created to facilitate caring for small children, especially when eating. Most parents of today's era are so busy with their daily work that their children's free time is affected. With the help of Baby Bib's Anti-Mess and a few supervised training sessions, there is no need to worry when your child is left alone to eat. Products made from polymer-type synthetic fabric and bowls made from bamboo wood now guarantee the safety and hygiene of users. Allah says in Surah Al-Baqarah verse 222, "...Verily Allah loves those who repent and loves those who

purify themselves." This Surah shows that a Servant of God must care for cleanliness from various aspects, such as nutrition, clothing, and the environment. This is important to prove our devotion as Muslims to Allah SWT [3].

Baby Led weaning is highly recommended by experts around the world, including Dr. Churbock says, "The basic idea behind baby-led weaning is that parents and caregivers can follow the baby's lead," meaning that babies who are trained to feed themselves will become more independent individuals [4]. Baby-led weaning also introduces babies to family mealtimes, which offers social reinforcement and positive development. Babies are recommended to start eating independently as early as six months old, with a specific menu. In addition, the food encouraged by experts includes vegetables and potatoes [4].

INNOVATION DEVELOPMENT

Initially, this product consisted of two already existing products in the market. The first product is a baby bib made of waterproof synthetic fabric. This bib is intended to facilitate cleaning and tidying up after the little one finishes eating. Parents need to rinse the bib with water and dry the bib. The second product is a plate or baby bowl made of bamboo, including a bamboo suction plate [5]. This plate or bowl ensures babies do not easily overturn their plate or bowl and spill food. These plates or bowls reduce food waste and prevent excessive dirtiness. The Anti-Mess Baby Bib was inspired to combine these two products so that it is easy for parents to store them. A mother and baby have gained popularity on the TikTok application because they practice baby-led-weaning (BLW) [6]. Since then, parents worldwide have been looking for products to help them start BLW [7]. Many are skeptical or don't want to do BLW because they are afraid of too much cleaning process that needs to be done. So, our product is intended to help parents to do BLW without having to pack too often.

In addition, the use of cotton fabric in this baby bib product is to provide comfort to the baby's skin. After researching and detailing, synthetic fabrics can adversely affect babies [8]. However, we have created a new design combining cotton and synthetic fabrics. This provides two benefits to the baby: the baby will be comfortable while eating because of wearing the product, and the cloth will be easy to wash after the baby has finished eating. Parents can wash the synthetic fabric part easily because, from the research, only that part will be affected by any food spills or dirt [7].

Design and Development of Anti-Mess Baby Bib

The Anti-Mess Baby Bib is a combination of the two products mentioned above. The synthetic fabric is cut into small pieces and will be placed on the suction plate or bowl. This baby bib is easy to handle because it is made of very easy-to-wash and durable material. This bib is combined with a plate or bowl made of bamboo, which experts worldwide highly recommend. The synthetic fabrics from this product are also safer for baby's skin. Parents do not need to worry about the baby's skin because this fabric suits all skin types. Parents only need to serve food and then soak the baby's bib in water for cleaning. Once dried, the baby bib is ready to be used again. Parents can also save space with this Baby Bib. It can be folded neatly or even hung according to each individual's taste. Baby Bib does not require a lot of storage space and can minimize clutter. All at once, this reduces the stress level of parents.

Methods and Materials

The Anti-Mess Baby Bib is made from waterproof synthetic and high-quality cotton fabric that prioritizes the baby's comfort. A Scrunchie is sewn in the middle of the baby's bib to connect with the suction bamboo plate. This product uses sewing needles, multi-colored threads, and scissors. In addition, the production of this product uses light fabric so as not to burden the baby who wears it and makes it easier for parents to put it back after use. The innovation prototype is shown in Figure 1.

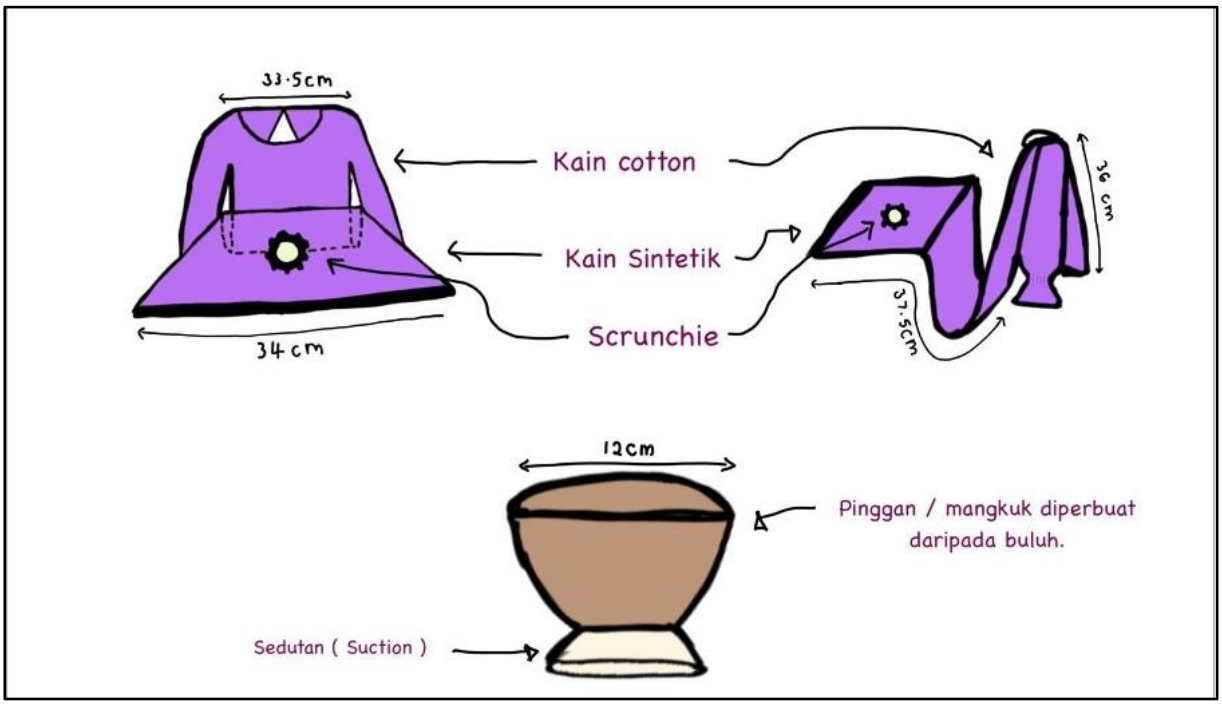


Figure 1: Innovation prototype

The bowl is suitable because it is naturally antibacterial and grown without pesticides or insecticides. Also, bamboo plates or bowls do not absorb odors easily. Just wash your hands with soap and water and let them air dry. This means parents do not have to worry about cleaning. Bamboo is stronger than steel in tensile strength, which means it can withstand more tension or tensile stress before breaking. Parents can serve hot food in a bamboo baby plate or bowl without worry because bamboo is heat resistant. Bamboo plates or bowls are easy to carry because they are light.

COMMERCIAL POTENTIAL

As early as nine months old, parents can start training their child's ability to eat on their own. Anti-Mess Baby Bib products are specially designed for this purpose by helping children to become more independent. Such training allows them to improve hand-eye coordination, which coordinates hand movements with eyes. This process is stimulated through training that involves children being independent using their own hands, such as training to eat by themselves without having to be fed by parents.

This innovative product can reduce messy or wasted baby food during their training. Parents benefit from the aspect of time that will be spent on cleaning and tidying up because Anti-Mess

Baby Bib is our innovative product that is anti-clutter. This is because the surface area of this product is huge and can cover the baby's table while preventing leftover food or dirt from spilling onto other places, such as the table or the floor. This baby bib is also improved by using a suction plate or bowl in the middle to prevent baby food from spilling.

Furthermore, high-quality ingredients benefitting babies and parents were used. For example, the waterproof synthetic fabric can facilitate this innovative product's cleaning and purification process. Bamboo plates or bowls were chosen because bamboo is not dangerous or poisonous to small children. After all, it is a natural material. In addition, we also use elastic rubber similar to the scrunchie hair rubber to ensure that the bamboo plate stays in a fixed position throughout the use of the Anti-Mess Baby Bib.

CONCLUSION

This Anti-Mess Baby Bib aims to facilitate children's learning process by using material improvements such as synthetic fabric, plates, and bowls made of bamboo with various shapes in one product. After all, this Baby Bib innovation plays an essential role in the post-industrial era and the current modernization era to make it easier and reduce the burden on parents regarding home cleanliness. With the presence of this baby bib, parents do not have to worry about their young children's safety, tidiness, and cleanliness while eating the food they prepare. With the use of quality cotton fabric, the baby's bib can provide good comfort when it wears it. This can prevent the baby from feeling itchy or having skin problems due to wearing this Baby bib if this garment is made of synthetic fabric. In addition, the synthetic fabric makes it easier for parents to clean up after use because it is waterproof and difficult for dirt to stick to.

REFERENCES

[1] Lifestyle, H. (2020, July 19). 5 Ayat Alquran yang menjelaskan Soal Kebersihan. kumparan. Retrieved February 21, 2023, from https://kumparan.com/hijab-lifestyle/5-ayat-alquran-yang-menjelaskan-soal-kebersihan-1tpobxMDwiK/2
[2] Harbani, R. I. (n.d.). 11 hadits Kebersihan Dalam Islam, terapkan di sekolah yuk! detikEdu. Retrieved February 21, 2023, from https://www.detik.com/edu/detikpedia/d-5746982/11-hadits-kebersihan-dalam-islam-terapkan-di-sekolah-yuk
[3] Ubaidillah, A. (2022, December 25). 10 hadits Tentang Pendidikan anak remaja 2023. Mustafalan. Retrieved February 21, 2023, from https://www.mustafalan.com/hadits-tentang-pendidikan-anak/
[4] McPherson, G. (2022, February 21). 11 foods for baby-led weaning and what foods to avoid. Healthline. Retrieved February 26, 2023, from https://www.healthline.com/nutrition/best-and-worst-baby-led-weaning-foods
[5] Getson, L. (2017, May 4). Bamboo Plates - How They Are Made. CiboWares. https://cibowares.com/blogs/news/bamboo-plates-how-they-are-made
[6] WFMC Health. (2022, September 21). Benefits of baby-led weaning. WFMC Health Salem Oregon. Retrieved February 23, 2023, from https://wfmchealth.org/pediatric-health-care/benefits-of-baby-led-weaning/
[7] Philips, A. (2019, June 13). BLW 101: Tips on how to start baby-led weaning. Retrieved February 26, 2023, from https://www.usa.philips.com/c-e/mo/parents-guide/other/tips-on-how-to-start-baby-led-weaning.html
[8] Nath, R. (2020, November 11). Why Synthetic Clothing is a Big NO for Babies? Bumps N Baby. https://bumpsnbaby.com/why-synthetic-clothing-is-a-big-no-for-babies

Fostering Grammar through Board Game: A Global Innovation

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ABSTRACT

The English language has been widely used. However, grammar poses the main problem for English as a Second Language (ESL) students due to its complexity and traditional teaching and learning method. Thus, this innovation aims to innovate the Grammar Board Game to equip students with fun learning for grammar. With the Grammar Board Game, students are no longer bored with learning. This board game is a 21st-century learning technique where students can learn while having fun. This innovation uses a combination of technology tools already existing in the local and global markets. Among the features of this Grammar Board Game is that it is equipped with a colourful game board map, sets of questions, and a set of "special power" cards, which are used to defeat other players. In the end, students can gain knowledge in a fun learning environment. This innovation certainly has a high commercial value, especially in the education industry, because it is built to help students achieve more effective and excellent academic sessions.

Keywords: 21st century learning; education; English as Second Language (ESL); game; grammar

INTRODUCTION

In this globalization era, everyone, especially parents, highly emphasize knowledge. This is because knowledge is the foundation of a Muslim's personality. Islam also places great importance on education as the main foundation of human life. This can be proven by the first revelation of Allah SWT to Prophet Muhammad SAW, which is Surah Al-Alaq, verses 1 to 5, where Allah SWT signifies reading as the primary way to gain knowledge. Therefore, at age 4, children are sent to kindergarten to be enlightened with education [1]. Parents are also aware of their role as teachers for their children's primary education, such as reading and counting. However, at a higher learning stage, students struggle to overcome various obstacles to acquiring knowledge. Students find learning difficult while maintaining a happy and emotional atmosphere [2].

In English language learning, learning at a higher learning stage requires complex language and accurate grammar. However, grammar poses the main problem for English as a Second Language (ESL) students due to its complexity and traditional teaching and learning method [3]. Therefore, many students seek solutions to overcome their learning problems and improve their understanding of grammar. In order to assist ESL students in learning grammar in a fun way, the Grammar Board Game was created.

INNOVATION DEVELOPMENT

The Grammar Board Game can solve students' problems by creating healthy learning competitions and a fun atmosphere that aligns with the 21st-century learning model. According to [4], games have the potential to be very effective learning tools because they can inspire a large group of problem solvers in dynamic systems and, at the same time, use creative data processing and problem-solving skills. What can be concluded is that games can make students' minds function more effectively. This is because some tasks and results make students want to complete the game as soon as possible. Students find it challenging to apply the knowledge they have learned in class during exams. They also want something that can make them happy even when studying [5]. In addition, they also want something that can encourage healthy competition while pursuing knowledge, whether in or outside of class.

Design and Development

Initially, this product was just an ordinary snake and ladder game produced to fill someone's leisure time. For example, Arepz and Co. reprinted the board game for sale in the market. The inspiration to modify and produce the Grammar Board Game arose after many students complained and said that learning grammar was challenging and unenjoyable [6]. Through this, it is clear that the spirit of their pursuit of knowledge has been affected. With smartphones, it is undeniable that students are increasingly immersed in the virtual world. Not only that, as we are aware, students also want to improve their exam results if they want to continue their learning to a higher level. These problems have led to difficulties for students in maintaining their concentration in learning [7]. Therefore, there is a need for innovation in learning grammar, whereby this snake and ladder game can help students regain their spirit, enjoyment, and concentration to continue learning with determination [8].

The Grammar Board Game has been modified from a regular board game to an effective one to improve students' academic performance. The game is designed to make learning a cheerful experience for students without difficulties in classroom learning. Students roll the dice and move their game pieces to the corresponding boxes. If the game piece stops at a box labelled "SP" (Special Power), the student must draw one card from the deck of cards in the centre of the board. This card can be used immediately or saved for later use. In addition, if the game piece stops at a box labelled "Q" (Question), the student must draw one Q card from the deck and answer the question on the card. If the student answers correctly, they may draw a "C" (Correct) card to move their game piece to another box as indicated. However, if the student fails to answer the question, they must draw a "W" (Wrong) card, which will result in a penalty of either moving backwards or skipping the next turn, as indicated on the card. The game can be played by 2 to 4 players.

Methods and Materials

Containers to store the Grammar Board Game are produced from durable "plywood" boards and can be used for a long time. This map-like game is made from cardboard wrapped in a plastic envelope so that it is not easily damaged. The cards are also produced from cardboard, but thinner and suitable for the length and width of the card. Figure 1 shows the elements of the Grammar Board Game.



Figure 1: Innovation prototype

COMMERCIAL POTENTIAL

With the existence of this Grammar Board Game, the issues highlighted can be overcome well and efficiently. This is because this board game can overcome problems such as students losing enthusiasm for learning. Creating a Grammar Board Game can also maximize students' enjoyment during and outside their learning sessions. In addition, with the creation of this innovation, issues such as students' lack of understanding can be reduced as best as possible because this board game helps students sharpen the knowledge they have learned in class. Furthermore, this invention can reduce educators' challenges in imparting knowledge to students in class.

This innovative creation can contribute to the fun learning session. In addition, this creation can also contribute to the student's skills and knowledge that will be used in the examination hall later. Furthermore, the materials used to produce this Grammar Board Game are environmentally friendly and will not contribute to environmental pollution. This game is also necessary for students and educators because it is one of the most effective learning techniques. It will get a lively response and high demand from many educational institutions if marketed and worthwhile as it aligns with the 21st-century learning model.

CONCLUSION

In conclusion, this innovation aims to innovate the Grammar Board Game to equip students with fun learning for grammar. This Grammar Board Game innovation plays an essential role in today's time to facilitate students' learning sessions and bring a fun atmosphere during or after the learning session. With this board game, students no longer worry about improving their English grammar. Hence, any problem students face when they want to review, or study can be solved successfully with this board game. Therefore, creating this Grammar Board Game is hoped to motivate students to continue learning English grammar.

REFERENCES

[1] Nuraini, T. (2022, March 22). Surah Al Alaq Ayat 1-5 Beserta Isi Kandungannya, Pesan Untuk Belajar Ilmu Pengetahuan. merdeka.com. Retrieved February 15, 2023, from https://www.merdeka.com/trending/surah-al-alaq-ayat-1-5-beserta-isi-kandungannya-pesan-untuk-belajar-ilmu-pengetahuan-kln.html.

[2] Iaremenko, N. V. (2017). Enhancing English Language Learners' Motivation Through Online Games. *Information Technologies and Learning Tools*, *59*(3), 126–133. https://doi.org/10.33407/itlt.v59i3.1606

[3] Hashim, H., Rafiq, K. R. M. & Yunus, M. M. (2019). Improving ESL Learners' Grammar with Gamified-Learning. *Arab World English Journal (AWEJ)*, *Special Is*(5), 41–50. https://doi.org/10.24093/awej/call5.4

[4] Schrier, K. (2016, November 10). Knowledge Games: How Playing Games Can Solve Problems, Create Insight, and Make Change. Retrieved February 15, 2023, from https://cmsw.mit.edu/knowledge-games-playing-games-can-solve-problems-create-insight-make-change/.

[5] Amid, N. (2020, October 19). Anak seronok belajar dengan bermain. berita harian.sg. Retrieved February 15, 2023, from https://www.beritaharian.sg/wacana/anak-seronok

[6] Hafiz, S. (2018, October 19). Sejarah Permainan Dam Ular. Retrieved February 15, 2023, from https://www.thepatriots.asia/sejarah-permainan-dam-ular/

[7] Gu, H., Yao, J., Zhou, L., C. K. Cheung, A. & C. Abrami, P. (2021). A Quasi-Experimental Study of a Web-Based English Literacy Tool for Grade 3 Students in China. *ECNU Review of Education*, *4*(1), 84–107. https://doi.org/10.1177/2096531120972709

[8] Zander, M. (2019, November 22). The Surprising Benefits Your Kids Get From Playing Board Games. scholastic.com. Retrieved February 15, 2023, from https://www.scholastic.com/parents/kids-activities-and-printables/activities-for-kids/arts-and-craft-ideas/benefits-board-games.html

Effect of Different Primary Light Colours on Growth of Betelvine (*Piper Betle*)

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ABSTRACT

This study aimed to investigate the effect of different primary light colors on the growth of betlevine (Piper betle). Betlevine plants were grown under four different primary light colors which are red, blue, green, and white light. The growth parameters will be leaf area, fresh weight, and dry weight, which were measured after three weeks of growth under different light conditions. The results showed that plants grown under red and blue light had significantly higher plant height, leaf area, fresh weight, and dry weight compared to those grown under green. The plants grown under white light had intermediate growth characteristics between those grown under red/blue and green light. The study suggests that red and blue light may positively affect the growth of betlevine, while green light may have a negative effect. The findings may have practical implications for the cultivation of betlevine and other crops that require specific light conditions for optimal growth and development. Further research is needed to elucidate the underlying mechanisms of the observed effects and to optimize the light conditions for betlevine cultivation.

Keywords: Betlevine; light colours; growth

INTRODUCTION

The name "betelvine" (Piper betle) is a binomial nomenclature, combining the terms "genus" and "species" and the botanical name for (Piper betle) is betel. This study used betel trees to study tree leaves. Light is one of the most important environmental factors for plant growth, as it starts with the absorption of light and continues through these processes and the fixation of CO_2.

Studies when betel trees are exposed to red, blue and green light as well as sunlight are carried out. The percentage of blue or red-light absorption by plant leaves is about 90%. Green light can penetrate further into the leaf than red or blue light, and continuous blue light is effective in inducing photomorphogenic responses. The combination of red and blue light is used nowadays more and more in research but also in commercial horticulture because it is the most effective wavelength band for photosynthesis at the leaf level in the short term and long terms. The betel tree was chosen in the study due to its many benefits, such as controlling blood sugar levels, reducing cholesterol levels, anti-cancer effects, and anti-microorganism effects.

However, due to the lack of agricultural land and the increase in the number of people, the productivity of photosynthesis must be increased. P. betel is also important due to the increase in global CO_2 concentration, so more plants are needed to convert CO_2 into O_2 to avoid global warming.

INNOVATION DEVELOPMENT

The most important details in this text are the preparation of four boxes to hold a betel tree, the addition of three different colours of lighting to each box, and the testing of the betel tree growth. To help the plant become used to daily living, the lights will be open in the morning, during the day, and closed at night. To test the betel tree growth, three readings should be taken such as the initial reading, the second reading, and the last reading. To draw leaves on milli grid paper, a pencil should be used to draw a line along the perimeter of the leaf and mark a pick on each box that fills half or more of the box. The surface area of a grid box can be calculated by entering the value in the length times the width formula. This method should be done in the second and third weeks.

Table 1 The chemicals, apparatus, and instruments used in the study

Chemical	**Apparatus**	**Instruments**
Normal fertilizer	Red LED Light	Betel leaf × 4
	Blue LED Light	Big box× 4
	Green LED Light	Millimeter grid paper

Results

Figure 2 shows that red and blue light growing plants have the highest leaf area compared to other plants grow lights in the second week, which may have been result from the starting feature. Further in Figure 3, on most red days has a large surface area from the blue plant grows light. But the surface area of the green light decreased.

Research studies have shown that different primary light colours have varying effects on the growth and development of betel vine. Red light is essential for the vegetative growth of betel vine, increasing leaf area, plant height, and leaf number. Blue light promotes the formation of chlorophyll and is important for the growth and development of the plant. Green light is least effective in promoting the growth of betel vine, leading to reduced leaf area, dry weight, and wilted. White light is a combination of all the primary colours and is essential for the overall growth and development of betel vine. The objectives of the study have been successful, but the experiment needs to be intensified. This study can provide knowledge on how to plant trees and ideas on how to produce a lot of results from planting trees in different light.

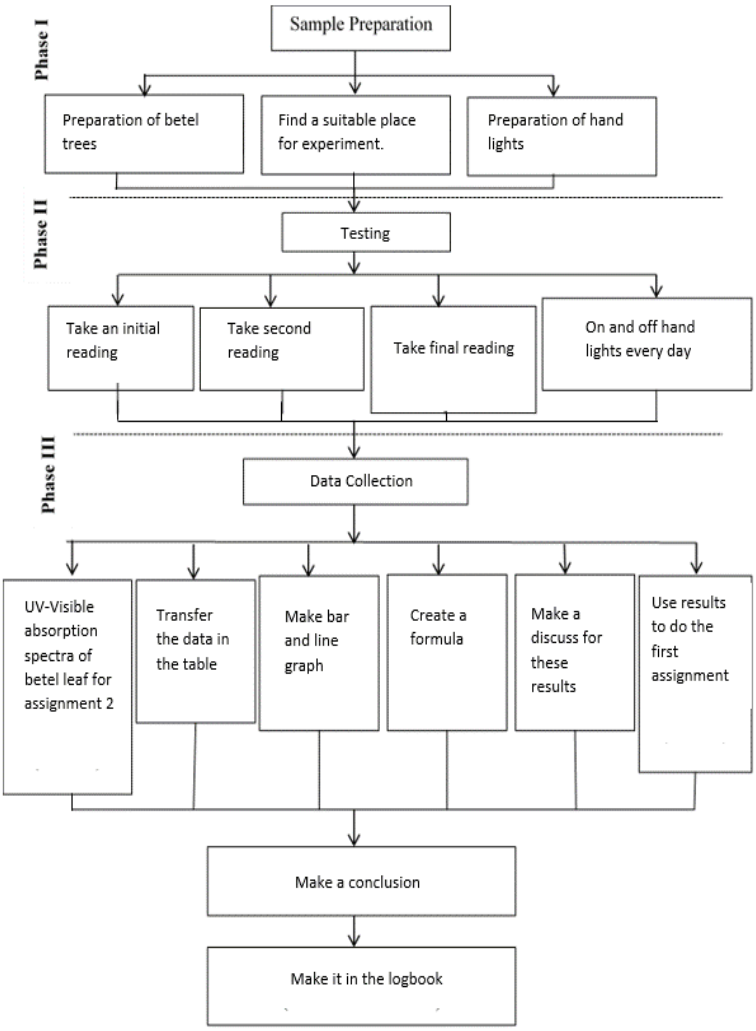


Figure 1: Flow chart of research methodology

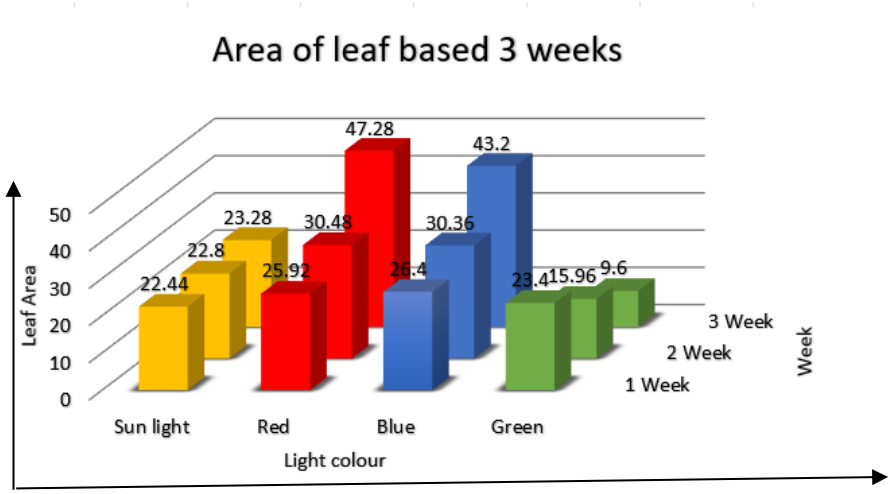


Figure 2: Area of leaf based 3 weeks in bar graph

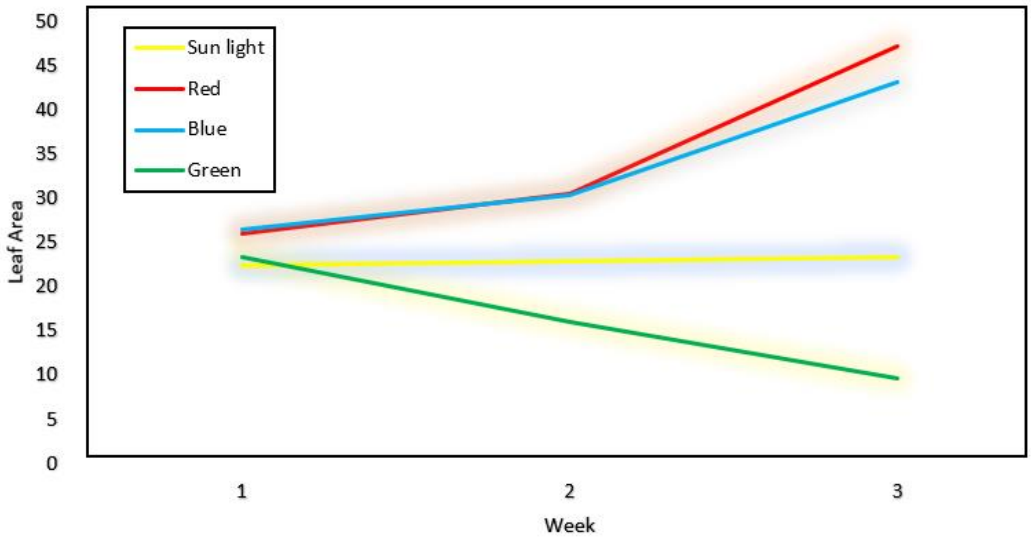


Figure 3: Area of leaf based 3 weeks in line graph

COMMERCIAL POTENTIAL

Piper betle, commonly known as betlevine, is a plant of commercial potential due to its many uses in traditional medicine, culinary arts and economic uses. It has medicinal uses, such as treating respiratory problems, digestive disorders, and skin diseases, and contains bioactive compounds such as alkaloids, phenolics, and essential oils, which have antimicrobial, anti-inflammatory, and antioxidant properties. It also has culinary uses, such as chewing it as a stimulant and breath freshener, adding flavour to dishes, and adding flavour to salads, smoothies, and other health drinks. Its cultivation has the potential to be a profitable enterprise, as it is in high demand for its various uses.

CONCLUSION

Research has found that the growth and development of betlevine (Piper betle) can be influenced by different primary light colours. Red light is essential for vegetative growth and can increase leaf area, blue light is important for the formation of chlorophyll and photosynthesis, and green light has a negative effect on growth. White light, which contains all primary colours, is essential for the overall growth and development of betlevine. Further research is needed to determine the most effective light conditions for betlevine cultivation. All research objectives have been achieved.

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REFERENCES

[1] Fukuda, N., Fujita, M., Ohta, Y., Sase, S., Nishimura, S., & Ezura, H. (2008). Directional blue light irradiation triggers epidermal cell elongation of abaxial side resulting in inhibition of leaf epinasty in geranium under red light condition. *Scientia Horticulturae*, *115*(2), 176-182.

[2] Terashima, I., Fujita, T., Inoue, T., Chow, W. S., & Oguchi, R. (2009). Green light drives leaf photosynthesis more efficiently than red light in strong white light: revisiting the enigmatic question of why leaves are green. *Plant and cell physiology*, *50*(4), 684-697.

[3] McNellis, T. W., & Deng, X. W. (1995). Light control of seedling morphogenetic pattern. *The plant cell*, *7*(11), 1749.

[4] McCree, K. J. (1971). The action spectrum, absorptance and quantum yield of photosynthesis in crop plants. *Agricultural Meteorology*, *9*, 191-216.

[5] Hogewoning, S. W., Trouwborst, G., Maljaars, H., Poorter, H., van Ieperen, W., & Harbinson, J. (2010). Blue light dose–responses of leaf photosynthesis, morphology, and chemical composition of Cucumis sativus grown under different combinations of red and blue light. *Journal of experimental botany*, *61*(11), 3107-3117. [6] American Psychological Association. (n.d.). Divisions. Retrieved October 28, 2018, from http://www.apa.org/about/division.

[6] Muhammad Ilhamdi Rusydi ,Arrya Anandika ,Budi Rahmadya ,Khandra Fahmy, Andrivo Rusydi (2019) Implementation of Grading Method for Gambier Leaves Based on Combination of Area, Perimeter, and Image Intensity Using Backpropagation Artificial Neural Network https://www.mdpi.com/2079-9292/8/11/1308

[7] Xiao Xue Fan, Zhi Gang Xu, Xiao Ying Liu, Can Ming Tang, Li Wen Wang, Xue lin Han (2021) Effects of light intensity on the growth and leaf development of young tomato plants grown under a combination of red and blue light https://www.sciencedirect.com/science/article/pii/S0304423813000332?via%3Dihub

[8] Xin Zhang, Tianmeng Fang, Yuqing Huang, Shengguan Cai.(2022)Transcriptional regulation of photomorphogenesis in seedlings of Brassica napus under different light qualitiesPlanta,256: 77 https://link.springer.com/article/10.1007/s00425-022-03991-3

Lumi Lamp

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ABSTRACT

The Lumi Lamp is a multifunctional night lamp that allows users to enjoy soft luminous lighting. The Lumi Lamp is a versatile product as it may function as a night lamp, a reading lamp, and even a simple decoration or toy for children. For instance, students often need to read their textbooks or articles, complete their assignments, and prepare for major exams. While some prefer studying during the daytime, many have no choice but to study at night due to work or personal obligations and this can lead to excessive electricity usage. To address this issue, Lumi Light is a product created that uses strontium aluminate which requires natural or specifically, UV light instead. This product saves energy and is an ideal choice for those who share a room with others as it provides lighting that is rather calming, hence, causing zero disturbance to fellow roommates who are trying to get their beauty sleep. Lumi Light aims to become the go-to product for parents, children, and students across Malaysia, in protecting the environment as well as for the convenience of its users.

Keywords: Night lamp; strontium aluminate; UV light; environment

INTRODUCTION

As the day transitions into night, everything around a person grows dark. Some individuals may appreciate the peace and quiet of the night, while others may fear it, particularly young children. To provide comfort in dark environments, a night lamp was invented and is now commonly used. Additionally, due to the availability of night lamps in various sizes and colors, they are also used as decorations in homes and offices, adding aesthetic appeal to the space [2]. However, most night lamps require electricity or batteries to function correctly, making them a costly option for individuals who cannot afford one, especially students. As most students can only complete their tasks after their daily classes, they tend to use their room lights more often at night. If they share a room, they must work quietly in the dark to avoid disturbing their roommate. This limitation can cause difficulties for students who need to finish their assignments or tasks on time. The Lumi Lamp, a more cost-effective and environmentally friendly option, is an appropriate choice for students who need a night lamp.

The Lumi Lamp is a modified night light that produces a blazing light without the usage of electricity or batteries by mainly relying on luminescent pigment, also known as a glow-in-the-dark pigment, such as strontium aluminate powder. The lamp's ability to glow on its own after being exposed to either natural or artificial light is made possible by this pigment. Unlike dyes, pigments do not dissolve in mediums; instead, they form a suspension that might be either more or less stable depending on the size of the pigment's particles and the level of viscosity of the medium [1]. Once it has been exposed and finished charging under direct sunlight, the Lumi Lamp will begin to shine especially during the night. The lamp has an extended self-glow time

of up to 12 hours after charging. Without significantly reducing the luminescence qualities, the charging and illuminating cycle can be repeated many times. On top of that, strontium aluminate is a non-toxic substance and, chemically and physiologically inert [3]. The colours of strontium pigments can range from light green to dark blue. Green emits a brighter glow than blue, which has the longest glow period. Last but not least, Lumi Lamp is offered in a variety of shapes, designs, and patterns that are ideal for different age groups and different uses.

On a final note, our team wishes that Lumi Lamp's goal of being the preferred product for parents, kids, and students throughout Malaysia as this night lamp has many advantages. Moreover, Lumi Light is an environmentally friendly night light alternative. Additionally, it requires neither electricity nor batteries to operate, and the Lumi Lamp only needs energy obtained through renewable sources, such as natural sunlight from the sun. In light of this, we think that our product will enable consumers to save money while simultaneously minimizing environmental pollution.

INNOVATION DEVELOPMENT

The Lumi Lamp has two components, one of the components is the object that is painted on, and the other is the strontium aluminate mixture that provides the glow of the lamp. The object is painted with the mixture which later it has to dry before it can be charged by any UV light, preferably under the sun. The mixture consists of 60% strontium aluminate powder, 30% water and 10% white acrylic paint. The colour of the glow produced depends on the strontium aluminate powder used in the mixture. This allows a lifespan of up to 10 years as strontium aluminate can be reused over and over again with little change in its quality. Lumi Lamp is also safe around children as strontium aluminate, which is the main substance used in developing the product, is biologically inert, non-toxic and non-flammable. Finally, the glow provided by the lamp can last up to 7 hours after a charging time of about 3 hours in the sunlight.

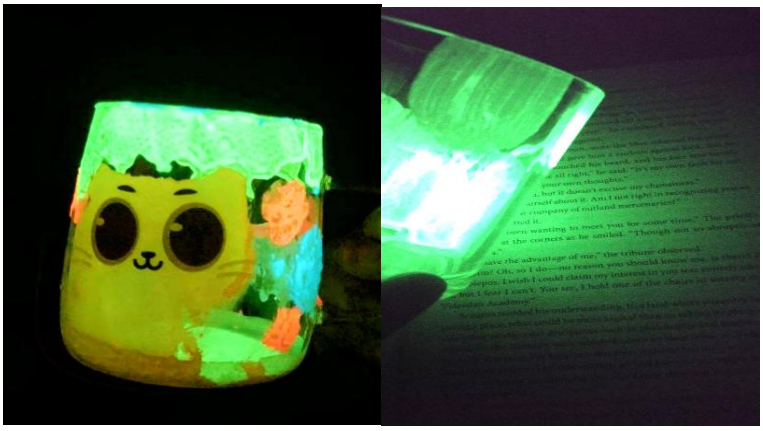


Figure 1: Lumi Light design and function

COMMERCIAL POTENTIAL

First of all, Lumi Lamp was developed with the intention to solve the problem that most people are facing which is the high electricity bills due to excessive usage of the light during the night whereby some people have difficulties with sleeping if the lights are off. This resulted in why Lumi Lamp heavily relies on strontium aluminate as the major substance because it works as lighting that can minimize electricity usage for a normal LED lamp and also can minimize excess light pollution [5]. By minimizing light pollution, it will contribute to a more beneficial

outcome for people and for the surrounding ecosystems such as in decreasing the electricity bills up to 10% to 20% per month [8].

Moreover, Lumi Lamp helps to save the environment without using electricity and only using the renewable energy which is the sun in order to charge the lamp intensity. As mentioned, the sun is the main source of charging the strontium aluminate for it to glow in the dark. This is due to strontium aluminates being considered non-toxic and are biologically and chemically inert that was proven by LTS Research Laboratories, Inc. in regards to strontium aluminate substance [7].

Additionally, the Lumi Lamp is designed to function without overheating. Traditional lamps utilize an incandescent bulb that heats up a filament through the use of an electric current. While the filament's glow produces light, significant heat is required to heat up the filament, causing the incandescent bulb to feel hot to the touch [6]. In contrast, the Lumi Lamp emits bright light without emitting any heat into the environment. It gradually dims on its own.

Furthermore, Lumi Lamp's target customers are all people of all ages such as students, workers that work at night and also housewives. For instance, as a student they can use the lamp to study at night and will not disturb their roommates who are sleeping at that time. Second, a housewife can use the lamp as a decoration in the living room or in the bedroom. Lastly, Lumi Lamp can be a toy for children at the age of 3 and above and can be a light source to accompany them to sleep. In short, our product can be multifunctional depending on who the consumer is.

Table 1: Lumi Light Expenses

Number	**Item**	**Price (RM)**	**Quantity**	**Total (RM)**
1.	Mug	12.90	1	12.90
2.	Strontium aluminate (10g)	5.13	1	5.13
3.	Brush	2.30	1	2.30
4.	White acrylic paint	2.30	1	2.30
Total Price				**22.54**

Above is the table for the modal Lumi Lamp, which is the total expenses for one Lumi Lamp is RM22.53. From the total amount, our team has decided to sell the lamp for RM30.00. Hence, by selling one Lumi Lamp we can get back the profit amount of RM7.47.

CONCLUSION

In conclusion, in consideration of the fact that the threat and pollution to the earth are far worse now than they were in previous decades, it is crucial for everyone to do their part in protecting the Earth. Everyone has a duty to preserve the environment since it is crucial to do so in order to avoid more catastrophic problems such as excessive air, water, and land pollution.

Since our product, Lumi Lamp, to be a more environmentally friendly alternative to the night lamps that are currently used in most households, this innovation will help to protect the environment. In order for this product to reach its goal, which is to provide a light source during the night or as house decorations, detailed research was conducted so that the lamp will not be relying on non-renewable energy sources like batteries.

Although this product appears to be ideal, we must acknowledge that product improvisation and future suggestions must be taken into account. Future recommendations for this product would be in terms of the manufacturing aspect so that it will be in a variety of shapes and colours in response to consumers' demands. It is hoped that this product would benefit the consumers and encourage the adoption of a more environmentally friendly night lamp in an effort to protect the environment.

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REFERENCES

[1] Anesh, M. P., Gulrez, S. K., Anis, A., Shaikh, H., Ali Mohsin, M. E., & Al-Zahrani, S. M. (2014). Developments in Eu+ 2-Doped Strontium Aluminate and Polymer/Strontium Aluminate Composite. *Advances in Polymer Technology*, *33*(S1).

[2] Cain, S. W., McGlashan, E. M., Vidafar, P., Mustafovska, J., Curran, S. P., Wang, X., ... & Phillips, A. J. (2020). Evening home lighting adversely impacts the circadian system and sleep. *Scientific reports*, *10*(1), 1-10.

[3] *Chemistry of Core Glow: Crystalline Strontium Aluminate SrAl 2 O 4 :Eu 2+*. (n.d.). Retrieved April 29, 2023, from https://www.coregravel.ca/site/assets/files/1018/chemistry_of_glow_-_englishfrench.pdf

[4] Corinne. (2021, December 11). *Is Glow in the Dark Paint Non-Toxic? (+ The Best Brands) - My Chemical-Free House*. My Chemical-Free House.

[5] Han, S. D., Singh, K. C., Cho, T. Y., Lee, H. S., Jakhar, D., Hulme, J. P., ... & Gwak, J. (2008). Preparation and characterization of long persistence strontium aluminate phosphor. *Journal of luminescence*, *128*(3), 301-305.

[6] Johnson, E. (1988). A phenomenological investigation of fear of the dark. *Journal of Phenomenological Psychology*, *19*(2), 179-194.

[7] Lee, H., Kim, S., & Kim, D. (2014). Effects of exercise with or without light exposure on sleep quality and hormone reponses. *Journal of Exercise Nutrition & Biochemistry*, *18*(3), 293.

[8] Peng, M., Yin, X., Tanner, P. A., Liang, C., Li, P., Zhang, Q., & Qiu, J. (2013). Orderly-Layered Tetravalent Manganese-Doped Strontium Aluminate Sr 4 Al 14 O 25: Mn 4+: An Efficient Red Phosphor for Warm White Light Emitting Diodes. *Journal of the American Ceramic Society*, *96*(9), 2870-2876.

[9] Sidiki, S. S., Hamilton, R., & Dutton, G. N. (2003). Fear of the dark in children: is stationary night blindness the cause?.*BMJ*, *326*(7382), 211-212.

Gas Explosion Prevention System (Gepres)

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ABSTRACT

The gas Explosion Prevention System (GEPRES) is a prototype to prevent gas explosions and focuses on the kitchen area, where common gas leakage happened. With Internet of Things (IoT) technology, this prototype provides a wireless device to assist users to control gas leakage. Using a gas sensor or MQ9 sensor Arduino component, this prototype will detect gas leaks. Once it detects up to 30% of the gas, the prototype will send alert notifications to the user's phone. The user can cut off electricity to the whole house to prevent fire by just using the click button on the phone. The users can control the flow of gas trapped in the house by opening windows using button controls from the phone to reduce the gas. Using the MQ9 gas sensor, this prototype can help to reduce or stop the gas explosion. In conclusion, GEPRES can reduce the rate of gas explosions, can save many people from losing their homes, and prevent deaths. In the future, the system can be improved by adding more safety features to reduce the number of gas leakage accidents to a smaller percentage, thereby increasing the safety of the house even more.

Keywords: Gas; gas leakage; gas explosion; sensor

INTRODUCTION

Gas leakage has been one of the most dangerous scene causes in most of the countries including Malaysia. A study published by the American Chemical Society found there is an estimation of 630000 gas leaks every year, just in the local distribution systems. Most of the cases proved that they happened in the kitchen area where there are lots of electric utensils.The gas Explosion Prevention System (GEPRES) is designed to prevent gas explosions and it is specifically focused on the kitchen area, where the common gas leakage happened. This product is designed to deal with this problem where it is able to detect gas leakage and send an SMS to the owner so that the owner can cut off the electricity supply remotely if there is no one in the house. In addition, a small window will automatically open to allow the gas to flow out from the house and prevent the gas from trapped in the house.

This product is designed due to the rate of house explosions increasing every year, gas leakage occurs without one's consciousness, is able to harm people's lives, and can affect people's properties and belongings. The objective of this product is to reduce the rate of gas leakage that happens, to provide a device that can be controlled anywhere and is wireless, and to assist users that rarely stay at home to control the leakage.

INNOVATION DEVELOPMENT

The mechanism of this product is very simple. First, we have the gas sensor or MQ9 sensor that will detect if there are gas leaks, especially in the kitchen. Once it detects up to 30% of the gas,

it will send the alert notifications to the user. To prevent fire, users can cut off electricity to the whole house just by using the button on their phone. Users also can open their windows to allow all the gases to exit the house so their houses will be free from dangerous gases that can lead to death once it has been sniffed.

COMMERCIAL POTENTIAL

We specifically designed this product to prevent gas leakage around the kitchen area. It can be supplied to any place that uses LPG gas. It is also convenient for workaholics that rarely spend time at home. This product can help users to reduce the possibility of a gas explosion. This will save many lives and properties which are very significant. GEPRES will get its marketability because it fulfilled users' needs in every aspect such as it is convenient for people who spend less time at home. In order to commercialise this product, we have already made a few calculations to fix the price at RM 150. We come up with this affordable price to make sure everyone can buy and use this product.



Figure 1: Innovation prototype

CONCLUSION

In conclusion, GEPRES will save many people from losing their homes and prevent the deaths of so many people, particularly their neighbours. By doing this project, we learned how the mechanism of the MQ9 gas detector works after conducting additional research and study. We hope to improve the system in the future by adding more safety features to reduce the number of gas leakage accidents to a smaller percentage, thereby increasing the safety of the house even more. We hope that this product that has an MQ9 gas sensor can help to reduce or fully stop the accident caused by a gas explosion. This product is very important to monitor the gas leaked percentage and to give a one step ahead from gas explosions. On top of that, this GEPRES product is highly aimed at worldwide marketing because we want to help as much life as we can. Furthermore, this product price is very cheap and easy to use so we think that this product is reasonable and a must for a house to have one of these products. We came with the plug-and-play installment so it is very easy to set this product up. We really hope that this product will receive a huge welcome in the market and can make a huge innovation improvement due to the modern era.

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REFERENCES

[1] Ilham, R. (2022, December 28). Sembilan melecur akibat letupan dapur gas. *Berita Harian*. https://www.bharian.com.my/berita/nasional/2022/12/1044978/sembilan-melecur-akibat-letupan-dapur-gas

[2] Mokhtar, N. A. (2022, October 12). Kipas pengalir udara tidak dibuka punca 3 pengsan hidu gas. *Berita Harian*. https://www.bharian.com.my/berita/nasional/2022/10/1010698/kipas-pengalir-udara-tidak-dibuka-punca-3-pengsan-hidu-gas

MasterLaw

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ABSTRACT

Legal studies or law is an interdisciplinary liberal arts major. The study of law is certified as one of the most difficult studies in the world with a low rate of graduates with honors as compared to other fields. This is because the study of law is a difficult learning journey requiring high intellectual skills, perseverance, and adequate technology-handling knowledge to obtain information related to the study. Most foundation of law students experience difficulties in learning this field of expertise because apart from the mind-challenging study quarters, reference materials and documentation related to law are difficult to find on the internet and scattered everywhere. The existing reference material is expensive, not user-friendly or systematic with an outdated operating system that is time-consuming. An innovative take to solve these very problems in legal study is vital and this is the ultimate motivation for the establishment of the MasterLaw educational application. We are optimistic that the MasterLaw will be a learning channel of choice among law students especially at the foundation level. MasterLaw is a technological innovation that is technologically advanced yet maintains user-friendly essence apt to assist all students of law to master this field.

Keywords: Foundation of law students; innovation in learning; law students

INTRODUCTION

Repetitive issues that can constrain the development of the subject's literacy and understanding in higher education level that are faced by students learning law in particular are the lack of resources that cannot be accessed due to expensive reference materials as well as pre-existing "law library" operating systems that are outdated in practicality. This causes inefficient and non-progressive learning process and puts limitations to a supposed 21st century learning style in Malaysia.

In today's informational technology era, teaching materials must include the use of teaching aids (BBM) based on technology such as computers, smartphones, digital cameras and so on. Websites are also no exception in being an effective substitute in helping to make teaching and learning sessions more up to date. Today's generation are internet savvy, and the use of gadgets will be more appealing and may assist them tremendously.

INNOVATION DEVELOPMENT

The idea of producing this MasterLaw application exists to achieve several objectives as follows. The general objective is to become a learning channel for legal education for all Malaysians in general and law students in particular that is user-friendly and cheaper.

The specific objectives are:

1. **All-in-one**. We at MasterLaw aspire to build a comprehensive law-based user-friendly application that contains legal case studies, legal documents and articles as well as lecture recordings from various public universities and private universities better known as MasterClass (with due regards to intellectual property law).
2. **Top-notch law library**. MasterLaw plays a role in providing complete and high-quality reference materials to all users, especially to our users who are law students at institutions of higher education.
3. **Law for all**. MasterLaw gives all Malaysians access to Malaysian legal resources. MasterLaw also provides an opportunity for legal practitioners in Malaysia to join a robust legal ecosystem in addition to being a medium for sharing knowledge and expertise, business opportunities and building close collaboration among professionals in Malaysia.

Application's Usage



COMMERCIAL POTENTIAL

We at MasterLaw are aware that our software is still not a concrete and solid development of a one-stop center for Foundation Law students in our country. In general, providers such as Current Law Journal (CLJLaw) and LexisNexis have become legal learning channels as well as the main reference source for thousands of law students and professional legal practitioners in Malaysia over the past few decades. However, due to the complaints and wishes of law students who dream of a more user-friendly application with a reasonable price that is suitable with the budget of most students. MasterLaw also has its own uniqueness that makes it stand out from other existing "law library" applications. We cater for Foundation Law Students who are still at the beginning of their law journey and have much to comprehend and master.

Among the MasterLaw novelties are:

1. **Ultimate source**. Recordings of tutorial classes and lectures from both public and private universities in Malaysia that are certified and have high credibility in the field of law.
2. **Budget-friendly**. MasterLaw users can access extensive legal study and reference materials without having to spend a lot of money to buy law books and subscribe to various websites of digital "law libraries" that can reach hundreds of ringgits.
3. **One click away**. MasterLaw is a one-click-away alternative learning channel for students of higher education institutions to study legal cases with less of a hustle.
4. **One-stop educational platform**. Aspiring to be a comprehensive "law library" application, MasterLaw is always ready to provide any reference materials alongside complete legal documents and can help anyone who has a problem or inquiries in the field of law.
5. **Time saver**. MasterLaw strongly prioritizes a systematic and orderly method of storing materials to help save our users' time instead of having to spend a lot of time searching for reference materials in the library or on other existing "law library" applications that are not user-friendly.

Financial Model

“Masterlaw for all", whereby this application is basically free to ensure that our services are always available for the use of many, especially foundation law students. The no-charge service, which is the Normal Rate though a free service is still satisfactory where users can watch tutorial videos or in our term "Masterclass" which covers the teaching of various legal subjects to help improve students' understanding. In addition to Masterclass, the "law dictionary" service is also catered to make it easier for legal practitioners to find the definition of terms that are often used in the field of law.

There is also immediate access to the Penal Code and the Federal Constitution where these books are updated from time to time. Therefore, with our version users no longer waste money from having to buy the same book every time there is a change because we provide materials that are up to date to meet validity requirements. Various facilities are provided at Normal Rates to provide a satisfactory service to users however there are limitations to the freedom in the usage of some features available on MasterLaw.

Like most other applications, to get access or 'unlock' more advanced features to increase user satisfaction, a fee will be charged every month at a low and reasonable rate to ensure that this application appears affordable for all members of society, especially students who are targeted to be the main users of our application with either no income or low income.

Therefore, we see that the payment for the Premium Rate of rm39.90 per month is very reasonable with the advantages that come along with this subscription package. Among the advantages is the note-taking feature where users can take notes on the same app whilst watching tutorials on Masterclass. There is also a podcast feature that can benefit the user's time through audio input with this premium rate. Finally, access to the Masterclass is without any limitation as compared to the Normal Rate where the Masterclass is only allowed access at a maximum rate of only 3 entries per day.

Future Upgrades

Innovation is a thrust of any kind of success. Hence innovation is the main focus of application development as we strive toward a bright future. Many renowned companies in the world such as Synaptics, Samsung, and AT&T deliver quality products to the market bearing the sigil of innovation. Our objective of delivering a quality application to our targeted market enables us to take a few approaches to identify improvements.

Firstly, a future improvement is to launch the MasterLaw application on Google Play Store. This would broaden MasterLaw's market reach and accessibility significantly. At the moment, the app is only available to be downloaded on Apple Play Store. By making the app available on the Google Play Store, it will lead to increased usage and adoption due to its popularity on Android devices which have a vast user base worldwide. Henceforth, it would be beneficial for law students and practitioners who predominantly use Android devices.

Secondly, installing a built-in note-taking feature within the app would increase the functionality and productivity of MasterLaw, and widen the scope of its use whilst providing a much-improved consumer experience. Legal research often involves taking extensive notes, especially regarding relevant acts, enactments, case laws, legal articles and et cetera; Henceforth with the newly built-in feature, consumers no longer need to find themselves changing between applications when taking notes. This improvement is aligned with our objectives of "All-In-One". Moreover, consumers are able to organize their relevant legal notes for much more efficient legal research.

Thirdly developing an in-house cloud storage server. This will greatly improve the app's data management capabilities. These improvements come after great consideration because legal materials often consume storage heavily. By setting up additional cloud storage servers, the app could provide users with more storage and allow them to sync their data across multiple devices. This would also provide better data security, safeguarding valuable data from loss or damage.

Fourthly, adding a legal podcast would diversify MasterLaw's content and provide users with unique ways to access legal information. The nature and concept of podcasts have been gaining traction in recent years as they offer an engaging and convenient way to consume content. When put into comparison with other conservative media platforms such as television etc.; it is much more flexible as it enables the consumers to listen to the podcast at any time of the day, when studying, working, and even when driving. Moreover, the concept of voice modulations whereby the dynamics of the listeners and the speakers increase which enables a greater user experience. The legal podcast could feature discussions on legal topics, interviews with legal experts, analysis of recent legal cases, advancement of any kind in the legal field, and anything related to law. This would cater to different learning styles and preferences whilst providing users with a dynamic approach to staying updated with legal developments.

Lastly, collaborating with legal libraries both nationwide and worldwide would boost the app's credibility and increase legal resources. Legal libraries are reputable sources of legal materials. It will also expand the app's legal database and offer users a broader range of legal resources as it involves collaboration with varieties of jurisdictions. Henceforth establishing the application as a trusted source for legal research.

In summary, the proposed improvement voiced by our consumers will greatly establish MasterLaw as a superior legal app. This owes due to the fact that this proposed improvement is driven by consumer-oriented innovation, where the advancement made will greatly catapult MasterLaw towards a successful future where consumer needs are greatly prioritized. Thus, hand in hand with the current features, MasterLaw will be the only preferred choice for legal students and practitioners.

CONCLUSION

The 5th Industrial Revolution is defined as an integration of advanced technologies such as artificial intelligence, robotics, and the Internet of Things into all aspects of societies including education. From the perspective of education, it involves the adoption of innovative teaching methods that focus on personalized learning and the development of soft skills such as creativity, innovatively, critical thinking, and financial and digital literacy. Elements of the education system also adopt virtual learning with the use of Silicon Valley's technological products such as the use of Zoom, Google Meet, and Google Classroom have shaped the pedagogy of the 21st Century.

With that being said, the digital education approach applied in MasterLaw rebranded the learning culture of legal education. This owes to the fact that the 5th Industrial Revolution acted as a catalyst for technological advancement which helps life to be more convenient. Prior, legal students are required to spend a significant amount of time looking for material sources for their legal research. Nevertheless, technological advancement has successfully eased this burden, with CLJ and LexisNexis making legal resources conveniently accessible. Hence widening access to legal resources nationwide aligns with MasterLaw governing principles of "All-In-One" and "Law for All". Moreover, flexibility and mobilities for consumers are increased enabling legal students to access material sources wherever they are.

In an effort to establish MasterLaw as the preferred legal app, there are a few innovations made after taking in consumers' feedback. For instance, launching the app on Google Play Store, developing a built-in-note-taking feature, adding a cloud storage server, launching a legal podcast, and collaborating with legal libraries to increase the app's legal database.

In summary, MasterLaw will certainly ease the burdens of legal students that lack access to legal resources due to high cost, low flexibility, and uninteresting content. Our hope is that with this new and upcoming app in the market, we are able to reinvigorate the legal education landscape to a more dynamic, inclusive, and talent-attracting direction for the betterment of this nation's judicial landscape.

ACKNOWLEDGEMENT

Our highest appreciation and gratitude to our CTU 091 lecturer, Ustazah Khairah Ismail, and law lecturer, Puan Atifah bt Othman for your guidance. We are also grateful to the Centre of Foundation Studies, Universiti Teknologi MARA, Cawangan Selangor, Kampus Dengkil Universiti Teknologi MARA (UiTM) for sponsoring this innovative project to help encourage students to participate. This appreciation is also addressed to the team members and friends of the PI005 law department at the UiTM Foundation Center, who have contributed ideas and extended great cooperation in the creation of MasterLaw innovation.

REFERENCES

[1] Perlembagaan Persekutuan https://ppuu.upm.edu.my/upload/dokumen/20180726155658RUJ_1_PERLEMBAGAAPERSEKUTUAN_ULANG_CETAK_2016.pdf
[2] Lexis Nexis https://www.lexisnexis.com.my/solutions/malayan-law-journal
[3] Malaysian Bar https://www.malaysianbar.org.my/
[4] Portal Lembaga Kelayakan Profesion Undang- Undang Malaysia https://www.lpqb.org.my/index.php?
[5] Griffith, E. (2018, April 3). *Spotify and the triumph of the subscription model*. Wired. Retrieved April 18, 2023, from https://www.wired.com/story/spotify-and-the-triumph-of-the-subscription-model/
[6] Federal Constitution https://www.jac.gov.my/spk/images/stories/10_akta/perlembagaan_persekutuan/federal_constitution.pdf
[7] Iki Putra Mubarak v Kerajaan Negeri Selangor & Anor [2021] 3 MLRA 384 https://www.elaw.my/JE/01/JE_2021_18.html
[8] CLJLaw https://www.cljlaw.com/
[9] Grise, J., & Evensen, D. (2023). Getting It Right from the Start. Tennessee Law Review, Forthcoming.
[10] Schulze Jr, L. N. (2020). Legal education's difficulty with “desirable difficulties” and its impact on student success and bar passage rates. Journal of Applied Research in Memory and Cognition, 9(4), 428-432.
[11] Shamsitdinova, M. (2021). Difficulties in teaching law students listening comprehension in English language teaching. The American Journal of Political Science Law and Criminology, 3(01), 1-8.

BuzzAcademia

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ABSTRACT

BuzzAcademia is an educational game introduced by a group of law students. It is created for law students as an alternative to the fun learning concept. This game is related to a basic principle of Islamic law. In general, most law students are having a hard time focusing on this subject because they are spending too much time on other law subjects, which are also considered tough and challenging. However, the main reasons for the creation of this game were to promote and enjoy learning about this subject. Therefore, BuzzAcademia is an innovation that is made to increase the interest of students and also help them increase their knowledge. Students can enjoy playing this game while answering the questions. Besides, this game can only be played on a laptop. In conclusion, this innovation is a helpful medium for law students because they can find joy in their revision, and at the same time, it is also an alternative for last-minute revision.

Keywords: Educational game; Islamic law; innovation in learning

INTRODUCTION

As a student, focusing on a subject with a low frequency such as CTU091 is one of the biggest problems for the student, mainly in foundations in law. From the analysis of the final examination results in the last semester, it shows that the student is not bound to focus on a subject that was not targeted in the midterm examination. The problem arose when the results came out and CTU091 was one of the subjects with a low passing percentage. The core subject that has been focused on from the start will be an intervention to focus on another subject, CTU091. Most students will use this as a reason for their failure in the CTU091 subject in the final examination. This is one of the problems that we try to solve using this application. The second problem is that the student has less interest in religious subjects, mainly CTU091. This is because the idea that has been implanted in their heads from the start is to focus on only the core subject because this subject will be tested in the midterm examination. This problem is nowhere near a solution after the student leaves this subject to continue focusing on the core subject only.

BuzzAcademia is the solution that can help to end this problem. BuzzAcademia is an educational game introduced by a group of law students. It is created especially for law students as an alternative to the fun learning concept. This game is related to a basic principle of Islamic law. This innovation objective is to make the CTU 091 subject interesting and interactive while at the same time encouraging the student to learn in new ways with the help of technology. The student could enjoy playing this game while going through the questions inside the game. Our main goal is to increase the student's interest in learning the CTU091 subject and to help the student obtain a high score in the examination.

In conclusion, we hope our innovation will help the student bounce back and try their very best to score excellently in the upcoming examination. We also will always support the system from the backstage to bring better experiments to the students.

INNOVATION DEVELOPMENT

The idea of creating a BuzzAcademia came from the discussion on how to optimise our marks in the upcoming examination. Various methods of teaching and learning had been applied to various schools and higher education institutions. Gamification methods in education have been widely used to help students' understanding of topics. The "gamification" of BuzzAcademia is a new product that has been produced as a medium to aid in a better teaching method for educators in the learning and teaching processes. Gamification is a concept that introduces a topic in the form of games and functions as a method that applies the elements of role-playing games to learning a certain topic in a way that creates a joyful ambiance for the learner. Researchers have provided various definitions of the method of "gamification" and mostly imply it with a similar concept involving any form of game adaptation. Gamification is defined as the process of adding games or any game-like elements to something (such as a task) so as to encourage participation (Meriam Webster, 2020). Gamification can also be elaborated as the practice of making activities more like games in order to make them more interesting or enjoyable (Cambridge, 2017).

Most of the time, the student has problems understanding how the rules from the Holy Quran are applied in a simple manner for the foundation student. Although the author tried to make the wording easy, some students still failed to understand the text. Through this innovation, the wording that has been implemented in this application is easy to understand, and the questions were not that straightforward to increase the student's critical thinking performance. Various methods of teaching and learning had been applied to various schools and higher education institutions. Gamification methods in education have been widely used to help students understand of topics. The "gamification" of CTU091 is a new product that has been produced as a medium to aid in a better teaching method for educators in the learning and teaching processes. Gamification is a concept that introduces a topic in the form of games and functions as a method that applies the elements of playing board games to learning a certain topic in a way that creates a joyful ambiance for the learner. Researchers have provided various definitions of the method of "gamification" and mostly imply it with a similar concept involving any form of game adaptation. Gamification is defined as the process of adding games or any game-like elements to something (such as a task) so as to encourage participation (Meriam Webster, 2020). Gamification can also be elaborated as the practice of making activities more like games in order to make them more interesting or enjoyable (Cambridge, 2017).

The development of a BuzzAcademia, a concept with similarities to a "role-playing game," is based on searching for a way to get out of the designated map by fulfilling the quest and using critical thinking and high understanding to play. The development of BuzzAcademia is equipped with a pack that can be downloaded and is ready to be played anywhere. The first map refers to the place containing the basic or introduction to the topic area questions; the second and third maps refer to the place containing the extensive version of the topic. Each question is provided with an answer in accordance with the books written by honourable educators.

The game recommends single players. The players are represented by four characters. The player will first spawn in a general map. The player will need to settle the quest in the first

map, which is about Wahyu and the Quran; then, the player will need to settle the quest in the second map, which is about Al-Sunnah and Al-Hadith. The player now needs to settle the quest on the third map, which is about Ijtihad and Keutamaan Wahyu rather than Ijtihad. The question will be accompanied by a summarised version note. If a player fails to answer the questions, they can reattempt as many times as they want. A player who attempts the question and succeeds on the first attempt will be rewarded 2 points. A player who attempts more than once will be rewarded 1 and a half points as a souvenir. Each player who finishes the game has succeeded in mastering the topic and has a deeper understanding of the topics in methodology, Pembinaan Perundangan Islam.

COMMERCIAL POTENTIAL

The "gamification" of the BuzzAcademia has a high commercial value, especially in the sector of Perundangan Islam education, as the contents of the game are based on books written by honourable educators. Besides, the game is based upon the basic but most important knowledge of establishing whether Islamic law is valid or null according to Islamic principles. As an illustration, an act of establishing the law done without the correct requirements from the god or sunnah according to the necessity of Islamic principles becomes null and is not considered a verified law.

Based on researchers' studies, the method of "gamification" within the scope of Islamic studies has reaped many results and provides a market for sales nowadays. However, most "gamification" of Islamic studies in the market focuses more on topics such as tajwid, sirah, zakat, faraid, halal, munakahat, Arabic language, umrah, hajj, and wakaf. Meanwhile, the "gamification" of law topics specifically in syariah law is not found in the market yet, although this knowledge is the most basic and essential of all requirements for acts of worship.

Therefore, based on a sense of responsibility and a concern for the necessity of understanding syariah law, the "gamification" of BuzzAcademia was created to assist in easing the process of teaching and learning at all levels of educational institutions. This is because most teaching and learning processes in the field of religious studies, especially syariah law, are conducted in a traditional setting that needs to be improvised with flexible, innovative, and efficient features in order to help students adapt to the content of the information and receive it well.

Hence, the gamified BuzzAcademia focuses the product on various levels of educational institutions, for example, universities and colleges in Malaysia. The gamified BuzzAcademia produced corresponds to the learning and teaching processes of the 21st century, which produce exemplary students with elements in accordance with the National Education Philosophy, or Falsafah Pendidikan Kebangsaan.

Future Development

The development that is still ongoing is to release this application on a variety of platforms, such as Chrome. As the first step was complete with launching the application on the pay-per-download game app store known as Steam. Everyone can download this game from Steam without making any transactions. Most of the players provided positive feedback, which pumped our motivation to work harder on the next development.

We also plan to increase the level of difficulty and enhance the experience that the player gains from playing our game through pay-to-win style development in the future, which is usually known as in-app purchasing. The player needs to spend at least RM 8 to further their journey by seeking quests on another map with a different topic. The player can also make a bargain on their first transaction in the application. The player just needs to spend RM 67 for the full package map, plus extras like 100 in-game currencies and 3 cheat codes.

In the next development phase, we will be launching our gaming application, which is about a law subject that teaches the student about Malaysia's legal system, known as LAW 033. Wait for the further information that will be posted on the BuzzAcademia main page.



Image 1: BuzzAcademia was launch on STEAM in the early of january

The upcoming development will consist of the syllabus for semester 1, which is about the amendments to legislation, the court hierarchy, the procedure to bring the case before the court, and the procedure that should be fulfilled to bring the accused into a civil case.

In summary, the upcoming development is one of the wow effects that we are still working on to provide a great experience for the player. We hope the community will support us for the future of interesting learning processes.

Guide Towards Excitement

First, the player needs to Click on the character and go through the first door.
Second, meet the first character (non-player character), she/he will give you an instruction about how to get out of the place.
Third, after receiving instruction, the player will proceed to another character (non-player character), on the map to answer the question about CTU091 subject.
Fourth, after finishing answering all the character (non-player character) question the player will be given an instruction to return to the door at the start of the map by the last (non-player character).
Fifth, after exit, go through the second door to proceed to another map.
Sixth, Repeat step 3 until 5.
Lastly, go through the third door and repeat step 3 until 5, by the end of the map, you already finish your revision on the whole of chapter 7 of CTU091 subject.

CONCLUSION

Corresponding with technological advancements in the digital era, the implementation of gamification is greatly encouraged. This is due to the current generation preferring a more casual and solid approach with educational methods. 'Gamification' had greatly helped many educators and students in education. It is even implemented in accordance with students' interests as well as the demands of an education sector that is well developing. Moreover, the elements of 'gamification' is simple and flexible to be integrated into education.

In regard to that, the approach to gamification brings positive results in a student's cognitive development. It could improve their logical skills and help them to think outside of the box while playing the game. BuzzAcademia is not solely a game as it is packed with knowledge about Islamic law. Discussions about Islamic law are of utmost importance to be understood by every Muslim. This is because a clear understanding of the topic provides a sense of confidence for those performing their worship duties without doubt and scepticism. So, knowledge relating to Islamic law is applied in the game.

This 'gamification' of BuzzAcademia not only helps students and educators but could also provide an understanding of the topic to all Muslims as this game can be played by all ages. In order to further develop the game in the future, efforts had been made to improvise the concept of this game made by the researchers, such as dividing various levels of difficulty for the questions in the game like beginner, intermediate, and advanced with easy, medium, and difficult questions each. Besides, the production of a manuscript or a questions and answers book about all of the topics for discussion regarding Islamic law can also be developed in the form of online applications or (Apps). Online users who are interested in the game are able to download the app into their smartphones and can play the game online with their friends and family. In conclusion, it is clear that the 'gamification' development approach could provide interest to Muslims so that everyone emphasizes the need to acknowledge Islamic law.

ACKNOWLEDGEMENT

The idea of developing a gamified BuzzAcademia starts from the team of researchers' observations on the need to provide a new medium of teaching law subjects especially Islamic law which is a crucial element in providing validity of an act of worship. However, efforts would not have produced results without a platform to further work and test the idea.

Therefore, we express our greatest appreciation and gratitude to our employer Universiti Teknologi MARA (UiTM) for organizing the innovation competitions that provide a chance for our efforts on this innovation to be highlighted. The gamified BuzzAcademia participated in an innovation competition organized by the Centre of Foundation Studies in UiTM that are the Karnival Sains & Teknologi Islam 2023. Appreciation is also extended to fellow colleagues, lecturers in the Centre of Foundation Studies in UiTM, Dengkil campus, Selangor who provided ideas and lend helping hands to develop the gamified BuzzAcademia as well as students who provided feedback on the game that could be used for future developments.

REFERENCE

[1] Abdul Aziz, Azhar (2022). Metodologi Pembinaan Perundangan Islam. In Mohd Norazri Mohamad
[2] Cambridge international dictionary of English. (1995). Cambridge: Cambridge University Press.

[3] Furdu, I., Tomozei, C. & Kose, U. 2017. Pros and Cons Gamification and Gaming in Classroom. BRAIN. Broad Research in Artificial Intelligence and Neuroscience, 8(2): 56-62. Retrieved from https: //www.edusoft/brain/index/article/view.
[4] Gamification. 2020. In Merriam-Webster.com. Retrieved April 8, 2020, from https://www.merriam-webster.com/dictionary/gamification.
[5] Hasan, A. A. (1993). Pengajian Undang-Undang Dalam Sejarah Pembinaan Ilmu-Ilmu Islam. Jurnal Syariah, 1(1), 74–81. https://ejournal.um.edu.my/index.php/JS/article/view/28351
[6] Nurdin, N. (2019). Editorial Preface. International Journal Of Contemporary Islamic Law And Society, https://doi.org/10.24239/ijcils.vol1.iss1.1
[7] Robinson, K. (2021, December 17). Understanding Sharia: The Intersection of Islam and the Law. Council on Foreign Relations. https://www.cfr.org/backgrounder/understanding-sharia-intersection-islam-and-law
[8] Schell, J. (2008). The art of game design: A book of lenses. Morgan Kaufmann Publishers.http://doi.org/9780123694966
[9] Schacht, J. (2012). An introduction to Islamic law. Oxford Clarendon Press. https://doi.org/10.1163/156851909x451475
[10] Voll, J. (2009). Shari'a: Islamic Law in the Contemporary Context. Islamic Law and Society, 16(2), 237–238.
[11] Zaini (Ed.), Prolegomena Undang Undang Islam (pp. 193–221). Essay, Tru Book Legacy.Resources/wealth-management/sharia-law/

SInD: Self-Iron and Dryer

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ABSTRACT

The Self Iron and Dryer is a cutting-edge household gadget that combines drying, steam disinfection, and intelligent ironing features. This invention attempts to alleviate the problem of time-consuming and labor-intensive drying of clothing as well as improve human life by offering them automated products. The dryer makes clever adjustments to the drying time and temperature based on the moisture level of the garments, providing effective and gentle drying. This product's innovative invention involves the incorporation of steam disinfection and intelligent ironing features, considerably decreasing laundry burden and time. The dryer is also collapsible, which can shorten its height to almost half its original height, making it easy to store and save room. This product has great commercial potential since it targets busy homes and individuals that value time savings and convenience, besides lowering the cost of energy usage. Overall, the Self Iron and Dryer (SInD) is a novel invention that streamlines the laundry process by merging two tasks into a single machine, which is our specialty. For those searching for effective and convenient ironing and dying solutions, this gadget has the potential to become a must-have home item.

Keywords: Clothes dryer; steam disinfection; intelligent ironing; cutting-edge household gadgets; timesaving

INTRODUCTION

Laundry has always been a necessary yet time-consuming task in our daily lives. Traditional washing procedures require significant physical labour, especially when ironing garments, which can be time-consuming and exhausting. Additionally, some fabrics are delicate and challenging to iron without damaging the material, making it difficult to keep clothing looking its best.

The Self Iron and Dryer machine (SInD) was created to address these issues, offering an innovative solution streamlining the laundry process. This gadget is a sophisticated, automated ironing machine that simultaneously uses steam and disinfection technologies to dry and iron garments.

The main goal of this product is to make laundry more accessible, faster, and more efficient, freeing up time for other tasks while ensuring that garments are thoroughly ironed and disinfected. In addition, it seeks to simplify the washing process by eliminating the need for hand ironing, reducing the time and effort required to do laundry.

The Self Iron and Dryer Machine's innovative aim is to provide a convenient and time-saving laundry solution, making it easier for busy individuals to keep their garments looking their best without spending much time ironing. With its unique features and capabilities, this

device represents a significant advancement in washing technology, offering a practical and creative solution that will appeal to busy individuals and families.

Materials

The Self Iron and Dryer Machine (SInD) is made of a robust and lightweight material that provides excellent heat insulation from the handle to the machine's body. The body is made of SUS304, a corrosion-resistant, heat-resistant, and durable material suitable for external use[1]. Fibreglass fabric coated with silicone is used as an insulator inside the machine to retain heat and minimise energy loss to the surroundings.

The insulator cover cloth we use is silver-plated cloth and Nylon zip, both watertight and airtight. This allows steam to travel through the cover, improving wrinkle removal and drying time while providing a hygienic surface. Additionally, we use wood to make handles, clippers, and hangers, as wood can withstand temperatures up to 150 degrees Celsius without damage. Furthermore, it adds an aesthetic look to the product, making it more appealing to potential customers.

Additionally, we gathered feedback from similar products and found that some had mould growth issues due to the moisture and humidity inside the machine. When mould spores come into contact with a damp surface, they can thrive and grow [2]. To address this problem, we equipped our product with a UV light that emits radiation to kill mould and bacterial spores, preventing their growth and ensuring a hygienic environment inside the machine [3].

How Its Works

The machine works in two parts which are the ironing and the dryer. Both functions use heat, and air flows to disseminate thermal energy to the isolated system in the ISnD machine. Heat and air current is supplied by a heater fan built inside the machine as the excess air will flow through the vents. The ironing process uses mechanisms such as high-frequency nanoparticles to change the physical property of water from liquid into a heavier mist. It follows the steamer concept by adding heat and air current. The steam works by loosening the bonds between the long-chain polymer molecules in the fabric, reducing wrinkles [4].

On the other hand, traditional dryers only use a heater fan with a higher temperature compared to the one used for ironing. For our product, we set the dryer to maintain the temperature near 60°C, a standard temperature for speed drying and suitable for items such as t-shirts and poly-blends. In contrast, the ISnD combines steam and high temperature in one go, allowing both ironing and drying simultaneously, saving time and energy compared to the traditional approach of doing one thing at a time.

Results

Users will no longer have to worry about their wrinkled t-shirts or damp cloth or both because this machine shows incredible results and can solve it in one go.

Table 1: Results

Before	After
	

Our Self Iron and Dryer Machine (SInD) offers a convenient and time-saving laundry solution that simplifies the ironing process and ensures that your clothes are disinfected, dried, and wrinkle-free, making it a valuable investment for busy individuals and families.

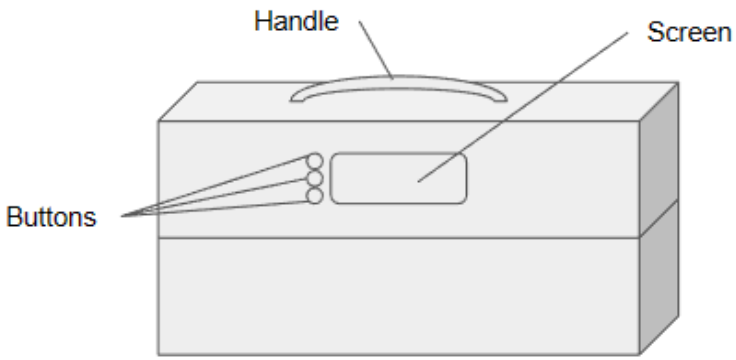
INNOVATION DEVELOPMENT

Our team has devised an idea to design a small, lightweight, and portable product with a modern look. Based on our survey, most people preferred a cuboid shape rather than a cylindrical one. In addition, they mainly voted for a pearl white colour with a metallic silver stripe as the best colour combination, reflecting their love for modernism. We also added a holder made of wood for users to carry around without hurting their hands.

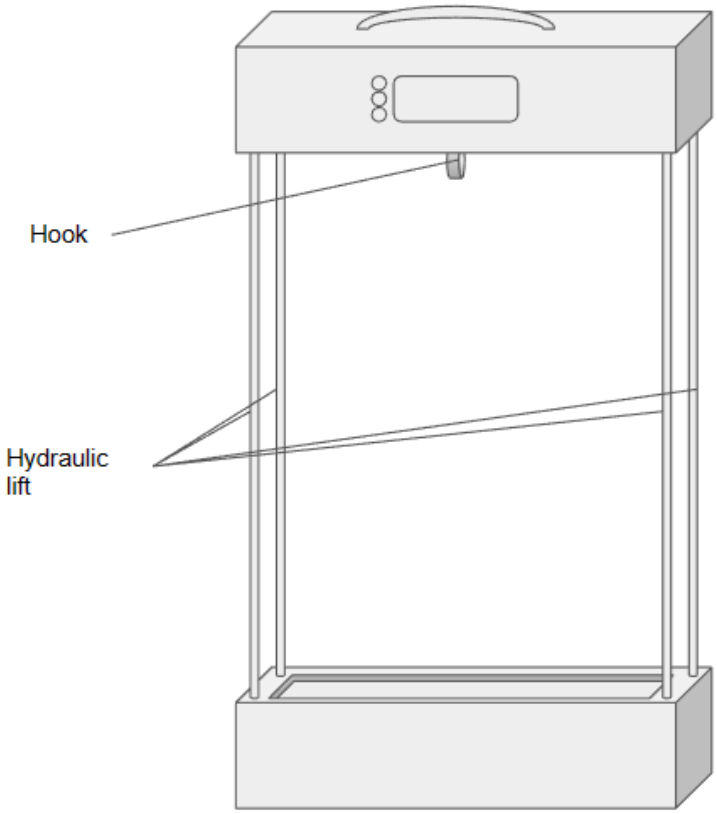
To quickly solve the problem of wrinkles and dampness in clothes and with a single action, we created a product that draws on existing products for reference but is still original. We use the steam concept for ironing, which involves applying steam to the cloth. This works by relaxing the garment's fibres and using gravity to eliminate wrinkles [5]. Rather than using a traditional steamer, our product utilises an ultrasonic mist maker that converts water particles into a heavy mist. This mist is heated and blown out by a fan at the correct temperature.

Draft

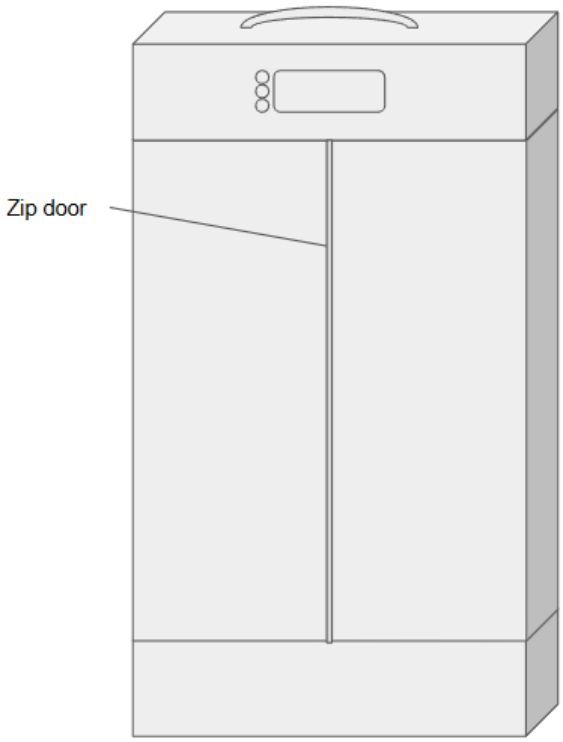
Closed:



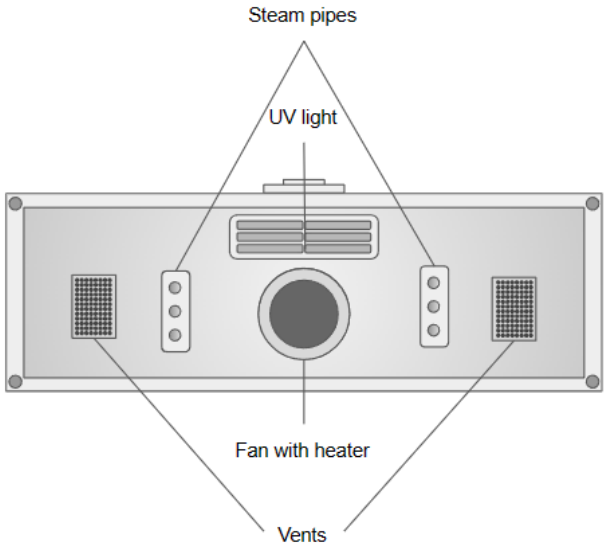
Open (Without Insulator):



Open (With Insulator):



Bottom Component (Top-view):



Product Colour

Pearl White (Main)
(Secondary)
Hex code: F8F6F0

Metallic silver

Hex code: #A8A9AD

COMMERCIAL POTENTIAL

Ironing clothes is a task that can be challenging for busy or physically impaired individuals, as traditional ironing machines require significant physical effort and precision. Additionally, conventional machines can damage delicate materials, causing burns or wrinkles that require additional time and effort to fix. To address these issues, we have designed an automatic ironing machine that can efficiently and effectively iron clothes without human intervention. As a result, we developed our product to save time, energy, and effort while ensuring wrinkle-free and safe-to-wear clothing.

Our automatic ironing machine utilises cutting-edge technology to provide a safer alternative to manual ironing, reducing the risk of accidents for people of all ages and abilities. The machine is designed with a heat-control system that prevents burns and wrinkles, ensuring that clothing is not damaged during the ironing process. It is also user-friendly and compact, making it easy to store and transport.

Overall, our automatic ironing machine is a practical solution for those who find traditional ironing machines too physically demanding or time-consuming. With our product, users can save time and energy, reduce the risk of accidents, and ensure their clothing is wrinkle-free and safe to wear.

Not to mention the product would cost less compared to traditional iron methods in the long term since it does not use a high heat that can cost much power. In fact, we designed a system which was a powerful steamer with the technology of nanoparticles by using the ultrasonic mist maker combined with low heat from the heater from the dryer. A fan blew the hot steam to provide airflow in the machine. Thus, the steam will spread evenly throughout the ironing process.

Last but not least, our product comes with UV light which can kill 99.99% of harmful microorganisms without adding chemicals or changing your water's taste or odour [6]. The positive side of this, it would solve the unpleasant odour on the cloth and make it more durable. Hence, UV light is a gentle process that won't damage the fibres of your clothing, leading to a longer lifespan for your garments and a reduced environmental impact.

Total Cost

Table 2: Price and Profit Margin

Item:	Quantity:	Price of each (RM):
Silver-plated cloth cover	1	21.50
Wooden Handle	1	2.16
SUS304	1	11.80
Fibreglass fabric coated with silicone	1	13.00
Wooden Clipper	2	2.84
Button	3	3.80
OLED LCD display screen	1	13.90
Wooden Hanger	1	2.90
Nylon hidden zipper	1	9.90
PTC Electric Heater	1	39.00
UV Light	1	13.78
Ultrasonic Mist Maker	4	1.77
Plastic Container	1 set (for 2)	3.71
Hydraulic Lift	4	3.80
Piezo	1	1.10
NodeMCU V2	1	19.90
TOTAL COST (RM):		192.00

Profit Margin

We would like to take 15% of the sale as our profit margin with the wages of assembly and product design.

Product Price: $Total\ cost \times 115\%$

$$RM192.00 \times 115\% = RM220.80$$

Price Differences

Table 3: Price Differences

Prices	
Our Product, Self-Iron and Dryer (SInD)	Other similar product
• Self-Iron and Dryer (SInD): RM220.80 ; comes with automatic iron and dryer (2-in-1)	• Iron: In range of RM159.00 to RM300.00 • Steamer: In range of RM250.00 to RM400.00 • Dryer: In range of RM279.00 to RM1500.00



Figure1: Self-Iron and Dryer (SInD)

CONCLUSION

We highly recommend that those looking for a quick way to assist them in drying and ironing their garments buy the Self Iron and Dryer Machine. This machine will help them by eliminating the struggles of ironing and drying. At the same time, users can move on with their other tasks while the device operates in the background without human supervision. However, our product could be better since we can make a few improvements. We strive to become the best of the best in the laundry market.

Firstly, we plan to integrate heat sensors and Artificial Intelligence (AI) into the machine to help us detect any significant change in heat, allowing the device to keep a constant temperature inside. To follow up, we also plan to conserve energy by applying a transformer inside the machine. Lastly, since our product is still too big to carry around, we would like to make it more compatible, allowing users to bring it more easily.

Therefore, users should carefully assess their needs and preferences before purchasing this product. The sorts of materials and clothing items they regularly need to iron, and their

budget and space limits may all be crucial concerns. Make sure the clothes are suitable to use in the dryer. Any customer mistakes are not the product's nor the company's responsibility.

ACKNOWLEDGEMENT

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REFERENCES

[1] World Material. (2020b). SUS304 Stainless Steel Material Properties, Chemical Composition, Meaning. World Material. https://www.theworldmaterial.com/sus304-stainless-steel-material/
[2] MoldBlogger. (n.d.). How does mold grow? Retrieved April 30, 2023, from https://moldblogger.com/how-does-mold-grow/
[3] AirLUCENT. (2022, August 24). Does UV light kill mold? Retrieved April 30, 2023, from https://airlucent.com/does-uv-light-kill-mold/
[4] Bellis, M. (2001, October 4). How clothes steamers work. HowStuffWorks. Retrieved April 30, 2023, from https://electronics.howstuffworks.com/gadgets/home/clothes-steamer.htm
[5] wikiHow. (n.d.). How to use a clothes steamer. Retrieved April 30, 2023, from https://www.wikihow.com/Use-a-Clothes-Steamer
[6] Diana, A. (2022, April 7). How Long Does It Take For UV Light To Kill Bacteria In Water? *Best Filters Life*. https://bestfilterslife.com/how-long-does-it-take-for-uv-light-to-kill-bacteria-in-water/

Bleed Bright: Overcoming Period Poverty with Menstrual Education

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ABSTRACT

Bleed Bright is a social innovation project addressing period poverty, which affects many women and girls worldwide. Period poverty refers to the lack of access to menstrual hygiene products, education, and facilities, which can lead to poor menstrual health, social exclusion, and economic disadvantages. Bleed Bright was launched for the first time on March 11, 2023, at the Contemporary Global and Legal Issues Exhibition 2023, targeting pre-university students at Universiti Teknologi Mara, Kampus Dengkil. The project's objective is to empower women and girls to manage their menstrual health effectively and overcome period poverty through menstrual health education and awareness. Bleed Bright collaborates with Libresse, a leading global menstrual care and hygiene company, to provide education and awareness through various channels. Furthermore, Bleed Bright aims to increase legal awareness of women's and girls' rights concerning menstrual health and hygiene. As the demand for sustainable solutions to address period poverty grows, Bleed Bright's focus on education and awareness aligns with the increasing importance of menstrual health and hygiene in society. The project's ability to provide sustainable solutions to this global issue creates significant market potential. In conclusion, Bleed Bright aims to equip women and girls with the knowledge and resources necessary to manage their menstrual health effectively and provide sustainable solutions to period poverty.

Keywords: Bleed bright; social innovation; menstrual education; period poverty; awareness

INTRODUCTION

Period poverty is a pressing issue that affects a significant number of women and girls worldwide, with an estimated 500 million experiencing it globally [1]. The American Medical Women's Association defines it as the lack of accessibility or affordability of menstrual hygiene tools and educational materials, such as sanitary products, washing facilities, and waste management [2]. The challenges women and girls face extend beyond a basic lack of supplies or infrastructure. According to a research group of the Red Care campaign, led by Sharifah Fatimah Al Zahra (2021), statistics show that 51% of respondents have no knowledge about menstrual preparation, personal care, and period management, which can have a detrimental effect on the physical and emotional health of women [3]. These findings correspond with the issue highlighted by Rossouw, L and Ross, H, that the lack of knowledge and education on menstrual health can contribute to period poverty [4].

Menstrual education is important for breaking the taboo around periods and promoting gender equality. Many girls and women around the world are still taught to feel shame and embarrassment about their periods, which can lead to a lack of access to menstrual hygiene products and information. Furthermore, the lack of access to menstrual hygiene products and facilities can lead to social exclusion and economic disadvantages for women and girls. Those

who cannot afford menstrual products may miss school or work, limiting their opportunities for education and employment, perpetuating the cycle of poverty, and further marginalizing already disadvantaged communities [5].

To address this problem, Bleed Bright was established as a social innovation project to provide menstrual health education and awareness to women and girls. Social innovation is a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals [6]. The objective of Bleed Bright is to empower women and girls to manage their menstrual health effectively and overcome period poverty by providing menstrual health education and awareness. The project collaborates with Libresse, a leading global menstrual care and hygiene company, to provide education and awareness through various channels. Additionally, Bleed Bright seeks to raise legal awareness regarding the rights of women and girls concerning menstrual health and hygiene. The motivation behind the innovation is to create a sustainable solution to period poverty by providing women and girls with the knowledge and resources they need to manage their menstrual health effectively.

INNOVATION DEVELOPMENT

The innovation development of Bleed Bright involves the use of a multidisciplinary approach to address the issue of period poverty. The project uses a combination of education, awareness, and advocacy to promote menstrual health and hygiene. The project was launched for the first time at the Contemporary Global and Legal Issues Exhibition 2023 (CoGLIEx) on March 11, 2023, particularly for pre-university students at UiTM Dengkil. The project seeks to create a sustainable solution to period poverty by empowering women and girls with knowledge and resources. One of Bleed Bright's innovative features is its collaboration with Libresse, a leading menstrual hygiene and care brand, to spread awareness and education about menstruation health through a variety of platforms, including exhibitions, and social media. Through this collaboration, Bleed Bright can leverage the expertise and resources of Libresse to deliver high-quality education and resources to women and girls.



Figure 1: Booth displays at CoGLIEx 2023

For displaying the Bleed Bright prototype, a sample poster has been included. According to the poster, Bleed Bright provides information about menstrual hygiene products, their use, and the importance of disposing of them appropriately, as well as on period hygiene

and cleanliness. The project also aims to raise awareness of the rights of women and girls regarding menstrual hygiene and health. Bleed Bright also creates brochures and exhibit displays to draw attention to the issue of menstrual health education and period poverty. These materials include the causes, effects, and suggestions given by Bleed Bright for dealing with period poverty. In addition, to promote menstrual hygiene, 250 free samples of pads have been distributed to visitors which is a great opportunity to educate them about proper menstrual hygiene practices.

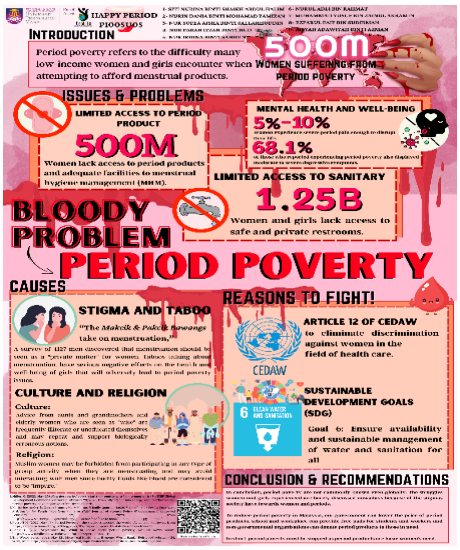


Figure 2: Awareness Poster on Period Poverty

COMMERCIAL POTENTIAL

Relevance of the invention

The invention of Bleed Bright is relevant in several ways. Firstly, it addresses the pressing issue of period poverty, which affects many women and girls worldwide. By providing menstrual health education and awareness, Bleed Bright empowers women and girls to manage their menstrual health effectively, which can lead to better health outcomes, improved social inclusion, and reduced economic disadvantages. Secondly, Bleed Bright promotes legal awareness regarding the rights of women and girls, particularly regarding menstrual health and hygiene. This can lead to better advocacy and policy development to address the issue of period poverty at a systemic level.

Thirdly, Bleed Bright promotes social innovation, as it addresses a complex social issue through collaboration between a global menstrual care and hygiene company and law students. This collaboration provides a unique perspective on the issue of period poverty and allows for the development of creative and effective solutions. Finally, Bleed Bright has commercial potential for law students, as it can lead to various avenues of revenue, such as merchandise, consultancy services, and product sales. This can provide valuable experience and skills for law students in entrepreneurship and business development.

Bleed Bright contributes to new knowledge and society by increasing awareness and education on menstrual health and hygiene, often neglected and stigmatized. The project aims to provide accurate and comprehensive information on menstrual health, including topics such as menstrual cycle, menstrual products, and menstrual hygiene management. By doing so,

Bleed Bright aims to eliminate shame and stigma surrounding menstrual health and empower women and girls to manage their menstrual health effectively.

Market Needs and Potential

The problem of period poverty and the lack of access to menstrual hygiene products and education drive the market needs for Bleed Bright. In sub-Saharan Africa, one in ten girls miss school while having a period [7], and in India, almost 23 million girls drop out of school each year due to menstrual-related concerns [8]. These figures highlight the urgent need for solutions that give girls and women worldwide access to period hygiene products and education.

There are many possible commercial potentials for Bleed Bright, including the development and sale of kits for menstrual education and awareness as well as booth services. The first commercial potential of Bleed Bright is by offering booth services at various exhibitions and events. Booth services may include distributing educational materials, showcasing products, and providing consultations or workshops. This approach offers a unique opportunity to engage with a diverse audience, build relationships, and generate revenue through sales of products or consultancy services.

Second, the creation and sale of a menstrual education and awareness kit, named the Bleed Bright Kit are also part of Bleed Bright's commercial potential. The kit will include educational posters and brochures about menstrual health and hygiene, legal matters related to menstruation, and information on how to make reusable menstrual products. This kit can be purchased online or offline, providing a sustainable solution for women and girls who may not have access to menstrual hygiene products and education. The development of Bleed Bright's kit not only serves as a source of revenue for the project but also supports the project's mission to empower women and girls in managing their menstrual health and eliminate period poverty. Additionally, as a corporate social responsibility project, the Bleed Bright Kit can be customised and offered to schools, organisations, and businesses to promote menstrual health education and awareness in various communities.

CONCLUSION

In conclusion, Bleed Bright is a social innovation project that addresses the issue of period poverty by educating and raising awareness among women and girls about menstrual health. The project has successfully met its goals of raising awareness about period poverty and providing access to menstrual health education and resources, particularly for pre-university students at UiTM Kampus Dengkil. Through collaborations with various organizations and the launch of the Bleed Bright Kit, the project has the potential to generate significant commercial opportunities. The kit and consultancy services provide practical solutions to addressing period poverty, making the project a socially responsible initiative and a viable commercial opportunity. The importance of menstrual education and awareness cannot be overstated, and Bleed Bright's focus on education aligns with the growing importance of menstrual health and hygiene in society.

In the future, the project plans to expand its reach and impact by collaborating with more organizations and implementing more innovative strategies to address the issue of period poverty. Overall, Bleed Bright has the potential to make a significant impact in improving menstrual health and hygiene for women and girls worldwide, while also generating commercial opportunities.

ACKNOWLEDGEMENT

The authors would like to express their gratitude to the Department of Law at UiTM Dengkil for organizing CoGLIEx 2023, where the Bleed Bright project was showcased to a wider audience. Additionally, we would like to express our sincere thanks to Libresse Company for collaborating and sponsoring our booth at the exhibition by providing 200 samples of menstrual pads. Their support was vital in spreading awareness about period poverty and the importance of menstrual health education. Finally, we would like to thank everyone who participated in our surveys and provided valuable insights into the challenges faced by women and girls.

REFERENCES

[1] n.a. (2022). Menstrual Health and Hygiene. The World Bank. Retrieved April 30, 2023, from https://www.worldbank.org/en/topic/water/brief/menstrual-health-and-hygiene
[2] Vardapetyan, A. (2021). Period poverty: the belittling of a basic need. American Medical Women's Association. Retrieved April 30, 2023, from https://www.amwa-doc.org/periodpoverty-the-belittling-of-a-basic-need/
[3] Sharifah Fatimah Al Zahra. (2021). Kemiskinan Haid di Malaysia; Situasi Masa Kini. Prosiding Persidangan Kependudukan Kebangsaan.
[4] Rossouw, L. & Ross, H. (2021). Understanding Period Poverty: Socio-Economic Inequalities in Menstrual Hygiene Management in Eight Low and Middle-Income Countries. International Journal Environment Research and Public Health, 18(5): 2571. DOI: 10.3390/ijerph18052571
[5] Mohd Tohit, N. F. (2021). Kemiskinan Haid Makin Meresahkan. Harian Metro. Retrieved April 30, 2023 from https://www.hmetro.com.my/WM/2021/08/749006/kemiskinan-haid-makin-meresahkan
[6] Phills, J. A., Deiglmeier, K., & Miller, D. T. (2008). Rediscovering social innovation. Stanford Social Innovation Review, 6(4), 34-43.
[7] Mensah, K. (2022). Period pad prices push girls out of school in Africa. Thomson Reuters Foundation. Retrieved April 29, 2023, from https://www.context.news/socioeconomic-inclusion/period-pad-prices-push-girls-out-of-school-in-africa
[8] Sigh, S. (May 28, 2022). Menstrual Hygiene Day 2022: Normalizing menstruation in India. Times of India. Retrieved April 29, 2023, from https://www.context.news/socioeconomic-inclusion/period-pad-prices-push-girls-out-of-school-in-africa

Tale of Candyman: Organ Harvesting Prevention Kit

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ABSTRACT

Organ harvesting is a serious and growing issue that affects many people around the world, including children. Organ trafficking and illegal harvesting of organs can lead to significant health risks and even death. Many children are not aware of the dangers of organ harvesting which make them vulnerable to organ harvesting. The Tale of Candyman: Organ Harvesting Prevention Kit is designed to raise awareness about the dangers of organ harvesting particularly among children. The word ‘candy’ is used because it is a common and alluring method used by traffickers towards children to start organ trafficking. The kit includes educational materials, such as infographics, flashcards, posters, a jar of organs, and an awareness pin. These materials cover a range of topics related to organ donation, the human body, and the dangers of organ trafficking. The kit uses fun and engaging activities to create awareness among children and encourage them to take steps to prevent organ harvesting. It is developed specifically for kids to inform them about the risks associated with child organ harvesting based on the materials provided. The Tale of Candyman was first launched on March 11, 2023, at the Contemporary Global and Legal Issues Exhibition 2023 (CoGLIEx), targeting pre-university students at Universiti Teknologi Mara, Kampus Dengkil. The kit has significant commercial potential and can be marketed to parents, educators, and organizations that work with children, such as schools. Therefore, the Tale of Candyman: Organ Harvesting Prevention Kit is an innovative and engaging educational tool that can help raise awareness and highlight the dangers of organ harvesting. It has the potential to make a positive impact on children's lives by educating them about the risks associated with organ trafficking and encouraging them to take action to prevent it.

Keywords: Tale of Candyman; organ harvesting prevention kit; child organ harvesting; awareness

INTRODUCTION

The demand for human organs has increased far more rapidly than the supply of organs in the field of organ transplantation [1]. This has led to an increase in the trade of illegally obtained organs, including those from children [1]. Moreover, children are seen as easy targets for organ trafficking as they are naive and can fall into the trap effortlessly. Organ trafficking is defined as "the recruitment, transportation, transfer, harboring, or receipt of living or deceased persons or their organs by threat or use of force or other forms of coercion, by abduction, by fraud, by deception, by abuse of power or a position of vulnerability, or by the giving to, or the receiving by, a third party of payments or benefits to achieve the transfer of control over the potential donor, for the purpose of exploitation" [2]. Other than that, organ trafficking can be viewed as

a component of a larger market that also deals in tissues, cells, and other items derived from human body parts. The sector is also referred to as the "red market" [3]. Organ harvesting, or organ procurement, refers to the surgical procedure that removes an organ from an individual, typically for transplantation. In some cases, the procedure may be forced or coerced [3]. Organ harvesting is a ferocious action that should not be normalized or allowed in our society as it goes against human rights as everyone should be able to live without fear of being part of organ harvesting.

Furthermore, regarding the issue of trafficking in children for organ removal, the subsequent United Nations Secretary-General Report on Preventing Combating and Punishing Trafficking in Human Organs (2006) stated that "while there is no conclusive evidence regarding such trafficking, it is noted that many abducted or missing children have subsequently been found dead with certain organs removed" [4]. Children are the most targeted group for organ harvesting as they are vulnerable and weak to defend themselves. It highlights the fact that children are the most targeted group for organ harvesting as they are vulnerable and weak to defend themselves. Therefore, everyone must spread awareness not only among adults but, most importantly, among children. Children should be made aware of how dangerous this issue is and take precautions for their safety.

To address this problem, The Tale of Candyman: Organ Harvesting Prevention Kit was developed as an engaging and educational tool to address organ trafficking among children. The project aims to create awareness among children and encourage them to take action to prevent organ harvesting. By using fun and engaging activities, this project provides an opportunity for adults to have a heart-to-heart talk with children about this issue, fostering trust and a sense of safety. The objective of the project is to provide a preventive measure against organ trafficking and to empower children to be aware and vigilant about their safety. The motivation for this innovation is the growing problem of organ harvesting, particularly among children. The authors recognized the need for an educational tool that can effectively inform children about the risks associated with organ trafficking and encourage them to take action to prevent it.

INNOVATION DEVELOPMENT

The Tale of Candyman was inspired by our booth at CoGLIEx 2023, where we used teddy bears, candy, faux blood, and organs as props. These visuals sparked the idea of creating an educational kit specifically for children, aimed at teaching them about the dangers of child organ harvesting. The innovative development of Tale of Candyman is a preventive tool against organ trafficking among children, designed to raise awareness and encourage them to take action against this serious issue.



Figure 1: The Tale of Candyman's booth at the CoGLIEx 2023 event, which served as a starting point for the development of our product.

The kit is meant to be utilized by important figures in a child's life, such as parents and teachers, to maximize its impact. What sets our product apart is its commercialized toy-like appearance, which appeals to children and helps them learn about the topic simply and enjoyably with the help of their caregivers. The kit has evolved into its present form based on the ideas and input provided by our team and the guidance of our lecturer. The kit includes the following items:

1. An infographic-style brochure about child organ harvesting
2. Candy
3. A jar to illustrate organs
4. Flashcards with information on the dangers of child organ harvesting
5. An awareness pin that children can wear to show support for the cause.



Figure 2: Item in Tale of Candyman's Kit



Figure 3: The front and the back of the kit's box.

The prototype of the Tale of Candyman kit boasts a colorful and attractive design that is sure to catch the eye of children. The packaging is designed to mimic that of a candy box, complete with educational materials and actual candy inside. Figure 3 showcases both the front and back of the box, with the front featuring the product name and images of some of the kit's contents, while the back provides a brief description of the kit and its purpose. The inventive features of the Tale of Candyman kit lie in its approach to educating children about a serious issue in a way that is both engaging and age appropriate. By incorporating fun elements like candy and a colorful design, the kit can capture children's attention and keep them interested in learning about a difficult topic. Additionally, the use of an awareness pin allows children to show their support for the cause and raise awareness among their peers.

COMMERCIAL POTENTIAL

Relevance of Invention

Firstly, to illustrate the relevance of the invention of Tale of Candyman, it is crucial to emphasise the seriousness of the issue of child organ harvesting. Although this issue is not commonly known, it is prevalent and poses a significant threat to the safety of children worldwide. The educational kit can play a vital role in educating people, especially children and parents, about the signs to look out for, the dangers of child organ harvesting, and what to do to decrease the risk of such situations. By increasing awareness, we can contribute to the prevention of the exploitation of children and save innocent lives.

Secondly, the Tale of Candyman can be instrumental in promoting awareness of the ethical and legal forms of organ transplantation. By expanding this product, we can encourage medical companies to improve their organ donation and transplant system. This is especially crucial since the shortcomings of these procedures are why many people turn to the black market. By providing information on the effects of the black market and the frequent auctions of illegally obtained organs featured there, we can encourage people to support ethical and legal forms of organ transplantation.

Thirdly, the Tale of Candyman is a crucial tool that can enable people and communities to recognise and react to circumstances involving the harvesting of children's organs. Healthcare providers can use it to recognise suspicious instances, provide care and support to victims, and report these cases to the appropriate authorities. The information provided can also be useful to law enforcement agencies in their investigations and cases against those responsible for the criminal act.

The market needs and market potential

The lack of awareness among the public about child organ harvesting is a serious problem that drives the market need for the Tale of Candyman. Globally, 20% of children are victims of organ trafficking. Disturbing cases of child organ trafficking in Malaysia, such as the kidnapping and murder of six-year-old Binbin [5] and the brutal death of 11-year-old Siti Masyitah Ibrahim [6], highlight the crucial need for solutions to ensure the safety of children.

The Tale of Candyman has several possible economic ventures, such as the sale of awareness-raising kits for child organ harvesting and the provision of booth services. The first potential is the sale of the Tale of Candyman kit, which includes brochures explaining child organ harvesting, information on relevant laws, and advice on how to avoid such incidents. The kit also offers entertaining advice to children on how to avoid becoming victims of this crime. It can be marketed to schools, hospitals, community centres, and other organizations to educate and raise awareness about the issue. The second potential is providing booth services at various exhibits and events, where we can distribute educational materials, demonstrate the product, and offer consulting or workshops. This program provides an opportunity to engage with a range of audiences, make connections, and generate revenue by selling goods or consulting services.

Budget and pricing of Tale of Candyman Kit

Items	**Price for production of one kit (RM)**	**Price for one month of production (100 kits) (RM)**
Cylinder jar	4.50	450.00
Organ diagram (Various types in one purchase)	15.00	150.00 (One purchase of the diagram can be used for 10 kits)
Red paint / Fake blood	2.70	270.00
Empty badges	0.30	30.00
Empty decorative box (Various colours)	4.00	400.00
Empty packaging plastic bags (One set)	1.20	120.00
Crafting tools and labels	10.00	100.00 (Assuming the tools and labels run out after the production of 10 kits)
Total	**37.70**	**1370.00**

The kit is priced at RM 14.00 per unit, which is deemed reasonable and allows for monthly production with an additional profit of RM 30. Customers have the option to customize the box according to their preferred color and design.

CONCLUSION

In conclusion, the Tale of Candyman Awareness Kit is an innovative and effective tool to educate children and parents about the dangers of child organ trafficking. It successfully achieved its objective to spread awareness through the Contemporary Global and Legal Issues exhibition, which included students of UiTM Dengkil and participants from various backgrounds. The kit provides information about the effects and factors of organ trafficking, allowing teachers to teach children and spread awareness.

The project's plans include expanding into a bigger platform by collaborating with more organizations such as SUHAKAM to further lower the rate of organ trafficking, especially among children. With its unique and educational approach, the Tale of Candyman Awareness Kit has the potential to create a positive impact and contribute towards preventing the exploitation of innocent children.

ACKNOWLEDGEMENT

The authors would like to express their sincere appreciation to the Department of Law at UiTM Dengkil for organizing CoGLIEx 2023, which provided a platform to showcase the Tale of Candyman project to a wider audience. We are also grateful to our lecturer, Madam Namirah Mohd Akahsah, who provided unwavering support and valuable guidance throughout the development of this project. Words cannot express our gratitude for her dedication and contribution to our success.

REFERENCES

[1] Bagheri (2015). Child Organ Trafficking: Global Reality and Inadequate International Response. Medicine, Health Care and Philosophy, 19(2), 239-246. Retrieved May 04, 2023, from https://pubmed.ncbi.nlm.nih.gov/26612382/

[2] UN Protocol. 2000. United Nations protocol to prevent, suppress and punish trafficking in persons, especially women and children. Supplementing the United Nations convention against transnational organized crime. Retrieved on May 07, 2023, from http://www.unodc.org/documents/treaties/UNTOC/Publications/TOC%20Convention/TOCebook-e.pdf.

[3] C. O'Regan (2021). International Organ Trafficking: In Brief. Congressional Research Service. Retrieved May 03, 2023, from https://sgp.fas.org/crs/row/R46996.pdf

[4] Secretary-General Report. 2006. Report to the Commission on crime prevention and criminal justice, on preventing, combating and punishing trafficking in human organs, 21 February 2006. Retrieved May 03, 2023, from https://www.unodc.org/documents/human-trafficking/2008/BP011HumanTraffickingfortheRemovalofOrgans.pdf

[5] Badd. (2019) How Common is Child Organ Harvesting in Malaysia? The Answer Might Surprise You. Retrieved 03, May 2023, from https://cilisos.my/weve-all-heard-of-child-organ- harvesting-stories-in-Malaysia-but-how-real-are-they/

[6] Mohamad Azim Fitri Abd Aziz. (2019). Kronologi Pembunuhan Siti Masyitah. Retrieved 03, May, 2023, from https://www.hmetro.com.my/mutakhir/2019/02/421596/kr onologi-pembunuhan-siti-masyitah

Stretchy Duster

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ABSTRACT

Stretchy Duster is one of the technologies that is made to overcome the flaws of the current eraser. The objective of this innovation is to reduce the time taken by the user to erase the whole whiteboard and to ease the user when holding the eraser. The current eraser that is small in size will increase the time to clear the whole whiteboard. Therefore, we created this innovation that can clear the whiteboard in half the time taken than a normal eraser to clear the whiteboard by increasing the size of the eraser. Other than that, the handle on the stretchy duster eases the users to use the erasers rather than the current erasers that have almost zero comfortability while using it. We plan on selling Stretchy Duster at RM45/each and plan to introduce it to huge stationery companies for mass production and commercial use. Stretchy Duster differs from normal whiteboard erasers in terms of size, durability, quality, and mechanicalistic. Our stretchy duster has user-friendly characteristics such as the length that can be adjusted according to the size of the whiteboard since it has retractable rods where it can go back to its initial position after using it. Moreover, the stretchy duster is created using high-quality materials where it can withstand daily wear and tear, are easy to be washed, and can be reused after washing.

Keywords: Stretchy Duster; eraser; stationery

INTRODUCTION

Whiteboard erasers are not unusual in our lives. It is used in the classroom and in workplaces that are closely related to the education industry. Although this technology was created long ago, it still has a lot of flaws that need to be overcome in order to have the perfect whiteboard eraser. For instance, unfriendly grip shapes cause the user to feel uncomfortable while using the whiteboard eraser and make it easy for it to slip off. Other than that, no specific place to put the whiteboard eraser often causes it to be misplaced and makes it costly since we would need to buy a new one. To add on, low quality materials that are used to make these whiteboard erasers makes it unfit to be used in a long period of time since it will fall apart after multiple use. Lastly, the small size of the whiteboard eraser causes the user to use more time to clear the whole whiteboard, not including hard to clean stains. This is time consuming for the users.

Stretchy Duster is specifically created to cater to all these flaws by making it more grip-friendly by adding a holder. Any hand size and hand strength can use this product without putting a lot of force into it. Other than that, Stretchy Duster is specifically created to be able to stay on the whiteboard by equipping it with a retractable component that would make the product hug the whiteboard. This can not only decrease the time and space to store and find the whiteboard eraser, it can also decrease the cost to buy new erasers since it won't be misplaced. Moreover, high quality materials that are used to make Stretchy Duster ensures that the eraser

will last longer and can withstand daily wear and tear in its daily use. This whiteboard duster is large in size causing it easier to clean the whiteboard, meanwhile for the hard to clean stain, stretchy duster is equipped with a spray that squirts out alcohol to clean the stains. This reduces the time taken to clean the whole whiteboard to at least half the time. This promotes maximum time in learning and working.

The main objective in creating Stretchy Duster is to make sure that the time used during learning and working is maximised on learning and working instead of unnecessary time waste on cleaning the whiteboard. Other than that, Stretchy Duster can also save the users money from buying cheap and low-quality erasers. Stretchy Duster is undeniably more expensive than regular erasers, but it would be a better option since it is created by using high quality material. It is a profitable investment.

INNOVATION DEVELOPMENT

Stretchy Duster is built larger in size to increase the surface area while erasing the whiteboard. We made the conclusion where the larger the surface area of the duster, the less time needed in order to clean the whiteboard. This overcomes the flaw of normal whiteboard erasers that takes too much time to clean the whole whiteboard. Other than that, the Stretchy Duster is also equipped with a retractable rod so that it can stretch and retract according to the size of the whiteboard. This makes Stretchy Duster inclusive to any size of a whiteboard may it be big or small. Stretchy Dusters also have built in “sliders” to ease the movements of the duster across the whiteboard may it be horizontally or vertically. To add on, this whiteboard duster is also portable. The retractable rod plays a huge role in making sure that the stretchy duster is at its smallest size while in transport and can be stored easily without it taking much space. It is also equipped with a handle to ease the process in transporting the stretchy duster.

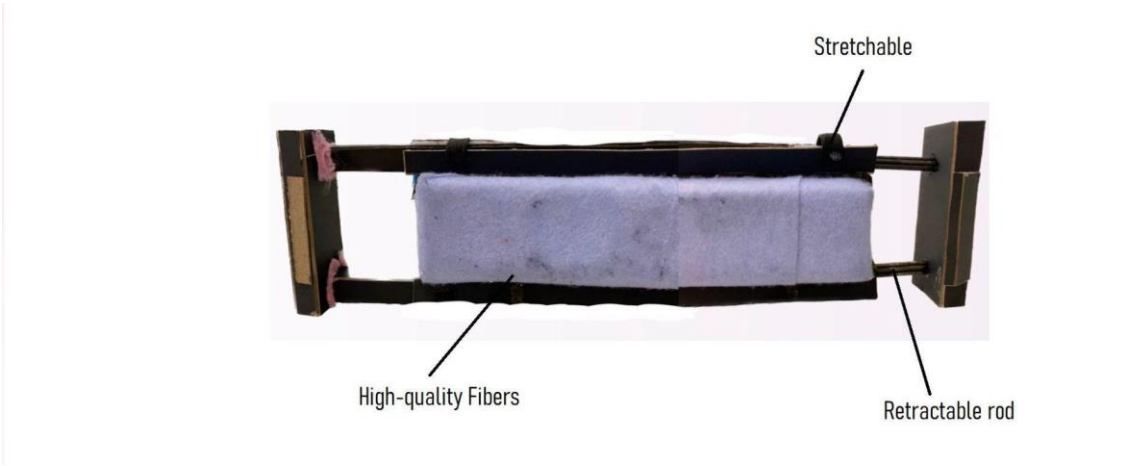


Figure 1: Stretchy Duster (Front view)

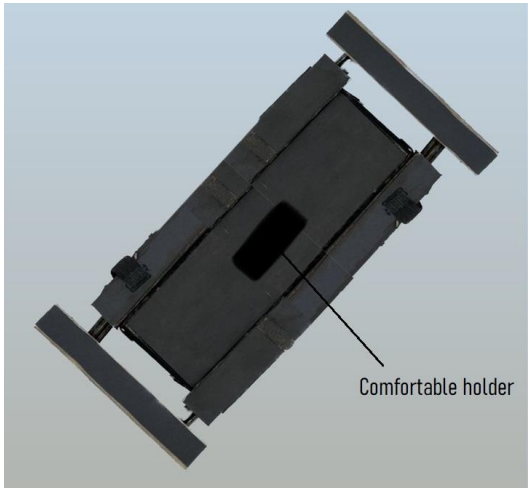


Figure 2: Stretchy Duster (Rear view)

COMMERCIAL POTENTIAL

Stretchy Duster focuses on the Educational Services Sector and Administrative and Support Services. The sales value of manufactured stationery in Malaysia was approximately RM 1.23 billion as reported in 2020 [*Statista, 2022*].

CONCLUSION

Stretchy duster can ease the lives of its users not only by reducing the energy needed to erase the whiteboard, but stretchy duster can also increase the quality of learning or discussion among the users. Since online is no longer the medium to discuss and learn, the use of whiteboard erasers has drastically increased, and stretchy duster has been created to make sure that the users no longer feel burdened while using it. Now it is up to the users to make the smart decision in choosing whiteboard erasers. Though stretchy duster has been innovated to be the perfect product, it still lacks in some parts. For instance, the retractable rod that is used to extend and reduce the lengths of stretchy duster is still flimsy and easily breakable if enough force is acted upon it. We plan on using a rod that is larger in diameter so that stretchy duster can last even longer and be hard to break. Other than that, we plan on changing the duster on stretchy duster to be detachable so that the users can still erase small parts of the whiteboard without having to erase the whole thing.

ACKNOWLEDGEMENT

The authors are grateful to Centre of Foundation Studies UiTM Cawangan Selangor Kampus Dengkil for their support in completing the innovation project.

REFERENCES

[1] Coupland, N. (2022, September 19). Whiteboard Vs. Dry Erase Board – Which is Right for You? *Whiteboards and Pinboards*. Retrieved April 1, 2023, from https://www.whiteboardsandpinboards.com.au/whiteboard-vs-dry-erase-board/#:~:text=Melamine%20is%20the%20type%20of,made%20from%20an%20inexpensive%20laminate.

[2] Embassy OFD. (2015). What makes our dusters so irresistible?. Retrieved April 1, 2023, from https://embassyfeatherdusters.com/what-makes-our-dusters-so-irresistible
[3] Leverette, M. M. (2023). The 4 best dusters we recommend to keep your home clean and help ease allergies. *Insider*. Retrieved April 1, 2023, from https://www.insider.com/guides/home/best-duster
[4] Lewis, V. (2019). Benefits of a Microfiber Duster — U.S. Duster Company. *U.S. Duster Company*. Retrieved April 1, 2023, from https://www.usdustercompany.com/duster-blogs/2018/10/9/benefits-of-a-microfiber-duster
[5] M. A. Sulaiman and Khairul Anuar A. Rahman (2008). Design and Development of an Automated Whiteboard Eraser. https://doi.org/10.13140/2.1.4101.7923
[6] M. Suresh et. al (2018). Design and Development of Automatic Whiteboard Cleaner for Effective Cleaning Mechanism Using Arduino. https:// doi 10.17148/IJIREEICE.2018.696
[7] Sales value of manufactured stationery in Malaysia from 2012 to 2020. Retrieved April 1, 2023, from https://www.statista.com/statistics/644649/sales-value-manufactured-stationery-malaysia/
[8] Stephen Morin, B. R. S. (2022). Best whiteboard eraser. Retrieved April 1, 2023, from https://kdvr.com/reviews/br/office-br/office-supplies-br/best-whiteboard-eraser/#:~:text=Most%20traditional%20whiteboard%20erasers%20are,attaching%20directly%20to%20the%20whiteboard.

Gotta Go Heater

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ABSTRACT

An electric kettle is a home appliance that is commonly used nowadays to prepare hot water in a short time. However, most of it is only available in large sizes, has a separate power base, and requires to be plugged into a socket for a power supply. On the other hand, the existing portable kettle still has a wire. All of the criteria mentioned make these kettles unportable and not really travel-friendly. Thus, we came up with the idea to innovate the kettle to go cordless by using rechargeable lithium batteries and also in the thermos. This will make our Gotta Go Heater portable and travel friendly. The target market is students, working people, travelers, and parents with babies. As our product is rechargeable and affordable, it will be convenient for the users to own and use them anywhere at any time. Hence, we believe our Gotta Go Heater will receive high demand from all users worldwide.

Keywords: Kettle; portable; cordless; lithium batteries; thermos

INTRODUCTION

An electric kettle is a home appliance that we commonly use in our daily life to boil water. There are various types and designs of kettles that have been sold in the market. However, all of these designs offer a large-sized kettle with a separate power base. On the other hand, to use these kettles, it needs to be connected to the power supply. Due to these criteria, it brings an inconvenience for the users to use it at anytime and anywhere.

There are a few problems we have taken into our discussion before we decide on our product. Based on our findings, the normal kettle that is being sold in the market only comes with a big sized kettle and needs to be connected to the socket for the power supply. In addition, the separate power base and size of the kettle requires large spaces for storage. Thus, this raises problem especially for parents with babies. They find it hard to have no easy access to hot water to prepare formula milk for their child mainly when they are traveling or going for a trip. On the other hand, students and workers who love hot beverages in the morning cannot have their drinks when they are rushing for class or work. Furthermore, having safe and clean hot water has been an issue among travelers [2]. Not to mention, people who go camping also having hard time to access hot and clean water as the electric kettle requires plug and socket for power source in order to work the kettle. To sum up, normal electric kettles are not capable of preparing instant and clean hot water for users when they are in a hurry or while traveling.

Considering this problem, our group has resolved to come out with a market-beneficial innovation for preparing on-the-go hot water. We decided to innovate the normal electric kettle to be a portable kettle packaged in the thermos. This product is a combination of an electric kettle and a thermos named Gotta Go Heater.

INNOVATION DEVELOPMENT

Our Gotta Go Heater is an innovation inspired by a common kettle. This product functions the same as a kettle except it enables the users to make hot water anywhere and anytime. Our Gotta Go Heater is compact in size and wireless so that it can easily be carried anywhere and is ideal when intent to make quick beverages. This provides a travel-friendly option to the users as well as enable them to have easy access to hot water.

There are several physic theories that we have implemented in building this product. The inside body of our product is made of 304 stainless steel, this material is suitable to use as it is an alloy, which then makes it resistant to corrosion. Stainless steel is also environmentally friendly because it doesn't leach chemicals when exposed to heat. Next, stainless steel is a metal with a low specific heat capacity. It can heat the water at high temperatures in a short time. Thermos bottle has a component of insulated material which is silicon that can keep the hot temperature of water by minimizing the heat loss [7]. The capacity of the portable water heater is 400ml. The heating element that is being used on this product is made up from nichrome, nickel and chromium. These are ideal materials to boil water faster as it has high resistance to electrical current [3]. The lithium battery charger module is connected to a lithium battery that will act as electric storage. The lithium battery charger module has been equipped with a USB micro connector. The portable water heater can be recharged as it uses the rechargeable lithium battery as power supply. The thermostat is installed in our product to regulate the temperature in the heating system. The thermostat allows the circuit to transfer heat to the heating element which then transfers to the water to start the heating process. Once it has reached the desired temperature, the heating process is stopped. A bottle pouch is included in this product, specifically made of silicon, a durable and heat-insulating material. This is so that the users can hold the bottle despite having hot water inside the bottle. Copper wire has low resistivity which makes it a good electrical conductor [6]. The diameter of the copper wire used is wide, following the physics concept of lowering the resistance. Thus, increasing the power efficiency.

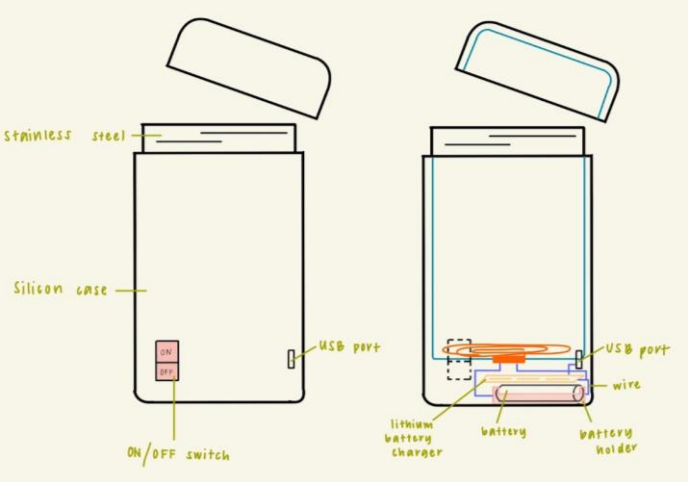


Figure 1: Schematic Diagram of Gotta Go Heater



Figure 2: Product Design

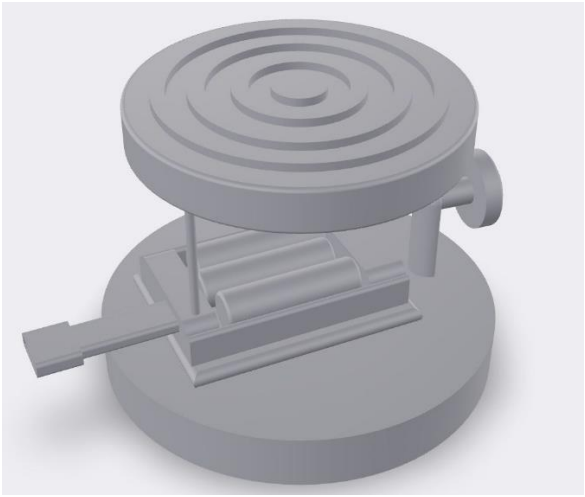


Figure 3: Circuit design

COMMERCIAL POTENTIAL

Gotta Go Heater was idealized for the purpose of reducing the energy and time in getting hot water. Most times, a heater requires a plug to switch it on which makes it difficult for some people who are on a trip. Not only that, it will also be a problem towards the students that do not have much time as they have a very packed schedule or the parents with babies and toddlers that require a lot of attention. Therefore, one of our main target markets is referring to the large and active travelers out there.The presence of this new product applies several physics concepts. The travelers can have convenient devices to have hot water. Thus, this will help to remove all the worries and concerns while traveling.

On top of that, we also include the students as our main target market as we want to help students keep active and energetic in the classes by providing instant hot water for students to have their breakfast and coffee in the class with the easiest and fastest way. Other than that, parents with babies and toddlers also become one of our main target markets. As we know, the babies always need to be fed on time, so the parents need to have access to hot water everywhere they go in order to make formula milk for their babies. Hence, by having this product on the

market, it will ease the parents.

The various functions of our Gotta Go Heater have made it very convenient for people to bring it anywhere without worries of not having any plug nearby. Thus, it is undeniable that our Gotta Go Heater will receive high demands from all the users regardless of any age.

Table 1: Price of Product (1 Unit)

ITEM	QUANTITY (UNIT)	PRICE (RM)
Thermos	1	15.00
Heating element	1	8.00
Lithium battery charger module	1	2.00
Lithium battery	3	20.00
Thermostat	1	4.50
Switch	1	0.60
Copper wire	1	1.30
TOTAL		51.40

CONCLUSION

Our Gotta Go Heater has numerous advantages for students, parents, travellers, and others. It is compact in size and lightweight, making it accessible to put into a backpack or suitcase easily. Moreover, it is designated in a thermos, allowing it to maintain the water temperature so that users can have warm water for a longer time. In addition, it also has a double lid to keep the water warm and avoid any leakage. This portable kettle also facilitates users with a rechargeable lithium battery. Thus, it doesn't need to plug into the socket for a power supply. Last but not least, the cable used to charge the portable bottle heaters can be put into the cup, which makes storage easier. This feature will make our product efficient and travel-friendly, which will achieve our objective.

Our Gotta Go Heater will continue to be upgraded by others by adding more features. Currently, our portable bottle heater maximum capacity is 400ml. However, with larger capacity available, users are able to prepare more hot water at once. Other than that, features that can be included are using renewable energy as the power source. For instance, a transparent solar panel is used for optional settings. This solar panel is indeed useful as it is very sensitive towards light. When the battery of this bottle heater is used up, it can still be used as long as it is exposed to sunlight. Not to mention, it is also eco-friendly.

ACKNOWLEDGEMENT

First of all, we would like to thank Allah SWT for easing our journey to finish this CREATIONS de UiTM: INTERNATIONAL MEGA INNOVATION CARNIVAL 2023. Alhamdulillah, we succeeded in coming up with a new idea of product innovation. We believe that our product will be beneficial in this era where all the users rely heavily on it.

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particularly this paper. Last but not least, we would like to applaud ourselves for successfully being able to overcome the unexplained stress and hectic schedule to accomplish our innovation project.

REFERENCES

[1] BS Stainless Limited. (2015). What is stainless steel and why use it? BS Stainless Limited. Retrieved May 12, 2015, from https://www.bsstainless.com/what-is-stainless-steel-and-why-use-it

[2] Zahra-Mulroy. (2019). Women proudly boil dirty knickers in Hotel Kettle and people are sickened, Mirror. Retrieved August 8, 2019, from https://www.mirror.co.uk/news/weird-news/woman-proudly-boils-dirty-knickers-18864602

[3] Functionality and materials. (n.d.). Kettle Heating Elements. From https://kettleheatingelements.weebly.com/functionality-and-materials.html#

[4] Centre of Disease Control and prevention. (2022). Water Treatment Options when Hiking,Camping or Traveling. Retrieved September 2, 2022, from https://www.cdc.gov/healthywater/drinking/travel/index.html

[5] How Do Electric Kettles Work? (2011). Explain that Stuff. Retrieved April 29, 2023, from http://www.explainthatstuff.com/how-electric-kettles-work.html

[6] Karia, P. (2022). *Copper wire resistance - An overview*. ThePipingMart Blog. Retrieved December 23,2022, from https://blog.thepipingmart.com/metals/copper-wire-resistance-an-overview/

[7] How does a vacuum flask reduce heat loss? (n.d.). Rang Dong Company. From https://vacuumflask.rangdong.com.vn/how-does-a-vacuum-flask-reduce-heat-loss-n439.html

[8] Richard B. (2022). 5 Advantages and Disadvantages of Tea Kettle. Retrieved June 2, 2022, from https://fashionforswag.com/advantages-and-disadvantages-of-tea-kettle/

HIROSE FACE SCRUB POWDER

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ABSTRACT

Nowadays, we can see that there are various new products introduced to facilitate human affairs in daily life, especially in beauty products. However, there are many beauty products on the market that contain chemicals that cause harm to consumers. Therefore, we created an innovation called Hirose Face Scrub Powder that can take care of consumers' facial skin more easily, safely, and efficiently. Hirose Facial Scrub Powder is an organic scrub that consists of organic ingredients such as Rosella flower powder or its scientific name Hibiscus Sabdariffa, rose petal powder, and Manuka honey powder. This product is a two-in-one product because it can be used on the face and body and is specifically created for individuals with sensitive skin or pregnant women. This product can be applied to all levels of society regardless of age and gender as it can treat facial skin problems naturally. Additionally, Hirose Facial Scrub Powder comes with an attractive and unique design packaging inspired by the shape of a rose and can attract users to buy it.

Keywords: Face scrub; Hibiscus Sabdariffa; organic; natural; beauty product

INTRODUCTION

Islam teaches us to value and practice hygiene and beauty, and to take care of our appearance as a tribute to others as mentioned in al Quran and al hadith. However, it becomes a problem when most beauty products are unsafe because they contain hazardous chemicals. According to research, most facial scrubs on the market contain banned chemicals such as Triethanolamine which is often used in cosmetics to set pH and act as a base for many cleaning products. It can cause allergies, including eye problems [1]. The effects of using products with active ingredients can cause physical changes to the skin that can be harmful to health such as inflammation, kidney damage, skin corrosion and some even contain lard in it. Things like this will cause users, especially pregnant women, to be afraid to use face scrubs as they are concerned about the baby’s health condition. For example, some facial scrubs contain formaldehyde which is a type of carcinogen and can increase the risk of infertility and miscarriage. Furthermore, the use of harmful substances in life also is prohibited in Islam. [2]

Therefore, the Hirose Face Scrub Powder was innovated to make life easier for users, especially those who like to take care of their facial skin more easily, safely and efficiently. This Hirose Face Scrub Powder has several natural ingredients such as Rosella flower powder, rose petal powder and Manuka honey powder. These organic ingredients are suitable for all skin types including individuals with sensitive skin. For example, Rosella flower powder can have a positive effect on facial skin such as repairing uneven skin tone, preventing acne growth, controlling facial moisture and delaying the effects of aging [3]. The same reason is also used on Rosa canina L. because this flower has the same benefits as Hibiscus sabdariffa [4] while

Manuka honey is used due to its ability to treat facial acne, skin problems such as psoriasis and eczema, remove dead skin cells and also used to treat scars [5].

This product also targets the pharmacology and cosmetology industry as the main place where it is marketed to consumers. The importance of this product is to enable users to take care of personal hygiene in a safe way, which is to use organic ingredients and lighten the burden of individuals in facial skin care even when traveling. This coincides with one of the hadith of the Prophet SAW narrated by Muslim, “Whoever relieves one of the hardships of a believer, surely Allah will relieve him of one hardship on the Day of Resurrection. Whoever makes other people's affairs easy, surely Allah will make his affairs easier in this world and in the hereafter".

INNOVATION DEVELOPMENT

Earth was created by God with the essence for humans to use natural resources as best as possible. As Allah SWT said in surah al-Mulk verse 15 which means "He is the one who made the earth for you that is easy to explore, eat and explore in all its corners and eat as from His sustenance. And to Him alone you (return after) being resurrected. (Q.S. al-Mulk [67]; 15), God has commanded humans to explore every corner of the earth and use the flora and fauna that exist on the earth for their own use and society.

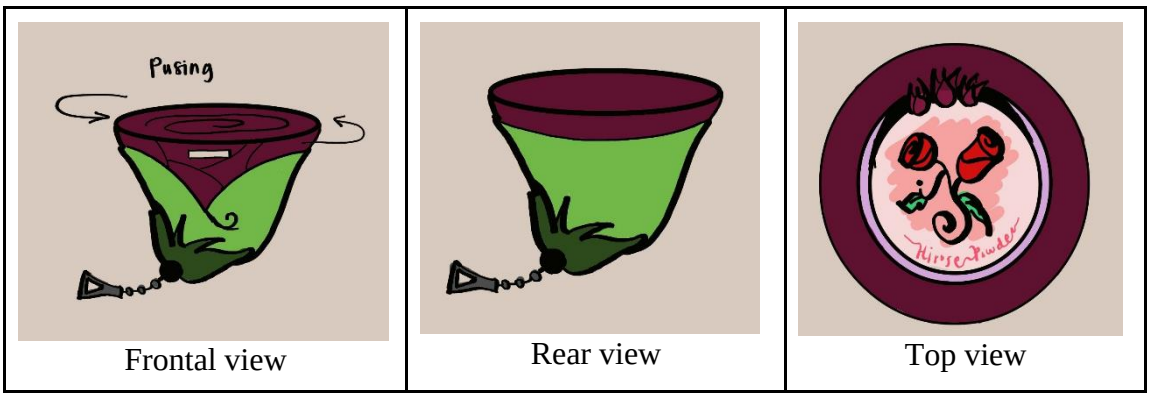
Hirose Face Scrub Powder is an organic face scrub through a combination of high-quality organic ingredients: Rosella flower powder, rose petal powder and Manuka honey powder. This product has the characteristics of easy to carry, durable, environmentally friendly, and stable. Its small size makes it easy for users to take it anywhere without having to take up a lot of space. Because this product is concentrated and does not contain water, indirectly it has a long shelf life without the help of preservatives. In addition, users do not need to worry about bringing this product onto the plane because it does not violate the limit of items that can be brought inside. In addition, since it is in powder form, there are no preservatives such as thickeners, emulsifiers, dangerous aerosols and so on, making this product environmentally friendly. This product can also be classified as a stable product because it can be mixed with water for use.

Hirose Face Scrub Powder has been innovated by using quality ingredients that are reasonable with its function. This product container is made of polypropylene where it has high durability and is able to withstand the pressure that is commonly experienced when on an airplane. The size of the product container, which is 6 cm long and 7 cm high, makes it easy to carry the product anywhere. At the same time, this product container can also be used as an accessory to beautify a handbag due to its rose-like design. The lid of the container is also made of the same material but is designed to be turned to use it so that the contents of the container can be closed without having to worry about the contents accidentally spilling out.



Rose Powder	Roselle Powder	Manuka Honey Powder

Figure 1: Ingredients



Frontal view	Rear view	Top view

Figure 2: Sample sketch of the product 'Hirose Face Scrub Powder'

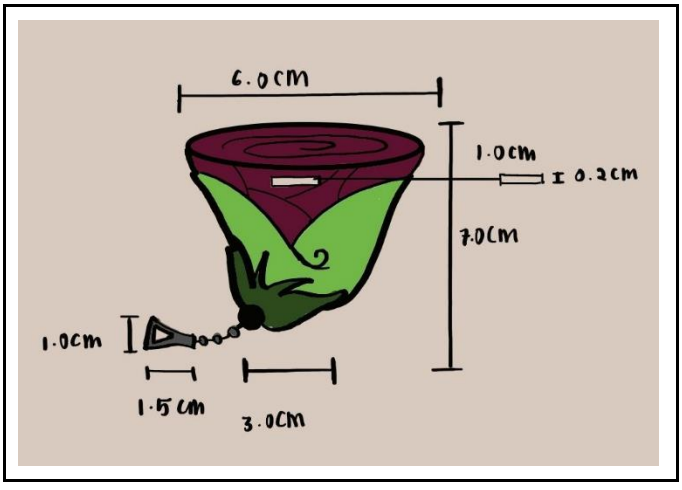


Figure 3: Product sample size of 'Hirose Face Scrub Powder'

COMMERCIAL POTENTIAL

All innovative products have their own commercial value and Hirose Face Scrub Powder is no exception in this regard. Among the commercial values found in Hirose Face Scrub Powder is that this product has an attractive design, meets the tastes of users, and is made of the best materials.

First, the container for holding the Hirose Face Scrub Powder has a unique design where the container for placing the Hirose Face Scrub Powder is designed to resemble a rose. Although the design of the Hirose Face Scrub Powder container is designed in such a way, this design can make it easy for the user to hold it easily. The size of the container which measures 6cm x 7cm makes it easy for users to carry it anywhere in addition to the installation of a key chain at the bottom of the product container which can not only be hung on the handbag but can also be used as an accessory to beautify the bag at the same time.

In addition, Hirose Face Scrub Powder also meets the consumer's taste by focusing on the effects of using Hirose Face Scrub Powder on the user. Hirose Facial Scrub Powder has the ability to fight signs of aging, improve and even out skin tone, hydrate facial skin, clean facial pores and moisturize the skin. Based on the list of capabilities of Hirose Face Scrub Powder that has been stated, it can be proven that this product meets the consumer's taste because some people in Malaysia experience skin problems that can be treated with the consistent use of Hirose Face Scrub Powder.

CONCLUSION

In conclusion, Hirose Face Scrub Powder can be used by all individuals because it only contains organic ingredients that are natural and safe for all skin types. For example, Rosella flower powder that can soften facial skin and can prevent the growth of acne. Then, this product is also easy to carry anywhere because its small size and powder form can facilitate the affairs of the community in facial skin care even when traveling. This product has been innovated in accordance with the rules based on the material allowed to be carried on airplanes, which is only 100ml. This product is also innovated in a small rose-shaped container with a key chain, resulting from the concept of a bottle of hand sanitizing liquid. This makes it easy for users to carry this Hirose Face Scrub Powder anywhere by hanging it on the bag and preventing it from being left behind. Next, this product is very suitable for use by all levels of society, especially Muslims because it is guaranteed halal and ablution-friendly because the ingredients in this product are all made from flora and honey only.

Then, our suggestion in the future is to add a digital clock to the Hirose Face Scrub Powder container to prevent users from forgetting the last time this product was used because it is only used once a week by adding a number display. We hope that this product can benefit the current and future generations so that their daily affairs are always smooth. In addition, we also hope that facial products on the market use organic ingredients as the main ingredient in their production so that health is prioritized over beauty because products containing chemicals can be harmful to personal health even though the effects of effectiveness are faster than organic products.

REFERENCES

[1] Dr Abdul Jamie Jamal Buhari, "Ketahui Kesan Bahan Kimia Produk Kecantikan," Beritan Harian, <Ketahui Kesan Bahan Kimia Produk Kecantikan (Bharian.Com.My)>(Accessed 18 February, 2023).

[2] Mustapha, A. M., & Junoh, N. (2022). Analisis Pandangan Hukum Menurut Ulama Kontemporari Dalam Isu Kepenggunaan Berkaitan Kosmetik: Analysis of Islamic Law Views According to Contemporary Islamic Scholars on Consumer Issues Related to Cosmetics. *Journal of Fatwa Management and Research*, *27*(2-SE), 166-183.

[3] Wang, D., Nagata, M., Matsumoto, M., Amen, Y., Wang, D., & Shimizu, K. (2022). Potential Of Hibiscus Sabdariffa L. And Hibiscus Acid to Reverse Skin Aging. *Molecules*, *27*(18), 6076.

[4] Vijayanchali, S. S. (2017). Nutrient, Phytonutrient and Antioxidant Activity of The Dried Rose Petals. *Journal Of Research, Extension and Development*, *6*(2).3

[5] Burlando, B., & Cornara, L. (2013). Honey In Dermatology and Skin Care: A Review. *Journal Of Cosmetic Dermatology*, *12*(4), 306-313.

Hanging Pump Station

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ABSTRACT

The hanging pump station is an innovation that should be easy and practical to use for users of all ages. It is designed according to the design of every type of vehicle in this era. The main function of this design is to make it easier for users to fill up with fuel more quickly, easily, and comfortably because everything is only at the tips of our fingers. The methods that we are using to build this hanging pump station are the hydraulic system, electronic system, and development system. The hydraulic system is the system that will make sure that the oil at the bottom of the platform can be channelled to the customer car tank while the electronic system is the system that will show the customer the quantity of oil that has been channelled to the car tank. Furthermore, the development system needs to be made carefully so that customers can use the hanging pump station without any problems in the future. Hanging Pump Stations can easier the driver's affair and shorten their time to refuel their vehicles. It also would indirectly faster the time to queue and prevent congestion and MyPump apps can be used everywhere and every time because it can be functioning although there is no internet connection.

Keywords: Pump station; innovation; user friendly

INTRODUCTION

Our group came up with the idea to innovate the manual oil pump to make it easier and faster for users to fill their oil. The Hanging Pump Station has a nozzle and hose that will automatically lower from the oil pump located on the ceiling of the gas station according to the user's desired height based on the Hanging Pump Station's special application. In short, our product's objective is to make it easier and faster for vehicle users to fill their oil, especially when they are in a hurry or emergency to get to a destination. The Automatic Gas Pump is built with high-quality and safe materials for users. The construction process of the Automatic Gas Pump involves hydraulic, electronic, and structural components. Each part of the Automatic Gas Pump requires a different factory to produce those specific materials. After completing the installation of the hydraulic and electronic systems, the installation of the exterior parts of the station is done using only high-quality materials that meet safety criteria. This is because the project is designed to make it easier for users while prioritizing their rights and safety while at the gas station.

INNOVATION DEVELOPMENT

The methods that we are using to build this hanging pump station are hydraulic system, electronic system and development system. Hydraulic system is the system that will make sure that the oil at the bottom of the platform can be channelled to the customer car tank while the electronic system is the system that will show the customer the quantity of oil that has been

channelled to the car tank. Last but not least, to ensure that this project will be successful, the development system needs to be made carefully so that customers can use the hanging pump station without any problem in the future.

COMMERCIAL POTENTIAL

Based on the findings, Hanging Pump Station received many positive comments in its development and drivers are excited to use it as it gives many benefits to themselves and also their surroundings. After doing some research, this innovative product will surely give many positive impacts towards people, society and also the country. First of all, Hanging Pump Station can easier the drivers' affair and shorten their time to refuel their vehicles. It is because users do not have to choose the position of the nozzle that complementary to their vehicle's fuel fill hole. Also, it would indirectly faster the time to queue and prevent the congestion. In addition, Hanging Pump Station also can be used by users of all aged as it is said to be user-friendly. This is due to the station that offer two different types of oil filling process which are by using the MyPump application and also by manually. Last but not least, the MyPump apps can be used everywhere and everytime because it can be functioning although there is no internet connection.

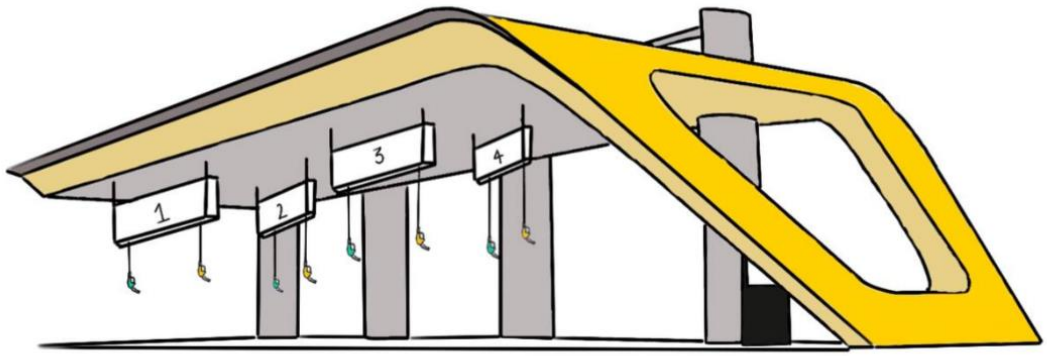


Figure 1: Prototype of Hanging Pump Station

CONCLUSION

Overall, this 'Hanging Pump Station' has the potential to help people in life regardless of age, race, and rank to refuel faster and more comfortably without any constraints. This user-friendly product is also expected to grab more people to use it as it saves time and energy. We hope that this 'Hanging Pump Station' product will be seen worldwide as we want to show that Muslims are able to compete in the field of Science and Technology on a par with other countries. We want to prove to the eyes of the world that Muslims have creativity and high competitiveness.

REFERENCES

[1] Bakhtiyar Shakirov Makhmudovich et al, (2022), Carrying out hydraulic calculation of the aquifer of pumping stations and work with sediments (in the example of the Ulugnor pumping station), V9, Eurasian Journal of Engineering and Technology, ISSN: 2795-7640

[2] Chaiko, Y., Zhiravecka, A., Kunicina, N., Galkina, A., & Ribickis, L. (2008). Modelling Decision Making Procedure for Pump Electric Drives Chosen for Water Pump Stations. Elektronika Ir Elektrotechnika, 82(2), 59-64.
[3] D V Skibo et al, (2019). Automated damping tank of sewage pumping stations, IOP Conf. Ser.: Mater. Sci. Eng. 687 044030
[4] V. Pupin, D. Safonov and O. Fedorov, (2020), "Modeling and Research of Operating Modes of Oil and Gas Pumping Stations to Determine the Requirements for Automation Devices,", International Ural Conference on Electrical Power Engineering (UralCon), Chelyabinsk, Russia, 2020, pp. 372-376

SalahSnooz

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ABSTRACT

Introducing SalahSnooz, a ground-breaking solution that addresses two significant issues: the challenge of maintaining a regular sleep schedule and mistakenly skipping prayers as a result of oversleeping. This product's objective is to improve customers' ability to concentrate while praying, leading to a more satisfying spiritual encounter. Although maintaining a regular sleep pattern is important for overall health and wellbeing, many people find it difficult, which makes them tired all day. SalahSnooz provides a cosy pillow that gently awakens customers with an integrated alarm clock or vibration motor. It not only fixes the oversleeping issue, but also gets rid of the bad sentiments and spiritual restlessness brought on by skipping prayers. SalahSnooz is a cheap, easy-to-use tool that is perfect for people of all ages, from young children to the elderly. It distinguishes out from other alarm clocks and sleep aids on the market because to its distinctive characteristics, making it a desirable choice for anyone looking for a practical and efficient remedy to their sleep issues. SalahSnooz has a significant economic potential due to its unique design and potential market appeal. People can live more happy lives, get better sleep, and strengthen their spiritual practices with the aid of this revolutionary tool.

Keywords: Pillow; vibration; solat; sleep schedule; missed prayer

INTRODUCTION

Sleep is essential for overall health and well-being, but many people struggle to get a good night's sleep. Aside from affecting physical health, a lack of sleep can make it difficult to maintain a consistent sleep schedule, resulting in difficulties waking up in the morning. Oversleeping can also cause feelings of guilt due to unintentionally missed prayers, as well as a lack of focus during prayer, which can diminish the spiritual experience for people who practice a religion.

To address these issues, SalahSnooz, a novel product, has been designed to assist individuals who have difficulty waking up in the morning, feel guilty about missed prayers, and lack focus during prayer. SalahSnooz is a pillow with an alarm clock or vibration mechanism that gently and effectively awakens users. The product is simple to use, comfortable, and inexpensive, making it suitable for people of all ages, including children, adults, and the elderly. SalahSnooz is a one-of-a-kind solution to common sleep-related issues that many people face.

According to a National Sleep Foundation study, 35% of American adults say their sleep quality is "poor" or "only fair," and 20% say they don't feel well-rested on most days of the week [1]. Furthermore, a Pew Research Center survey found that 63% of adults worldwide identify with a religion, highlighting the potential market appeal of a product like SalahSnooz that can help individuals who feel guilty about missed prayers and lack focus during prayer [2].

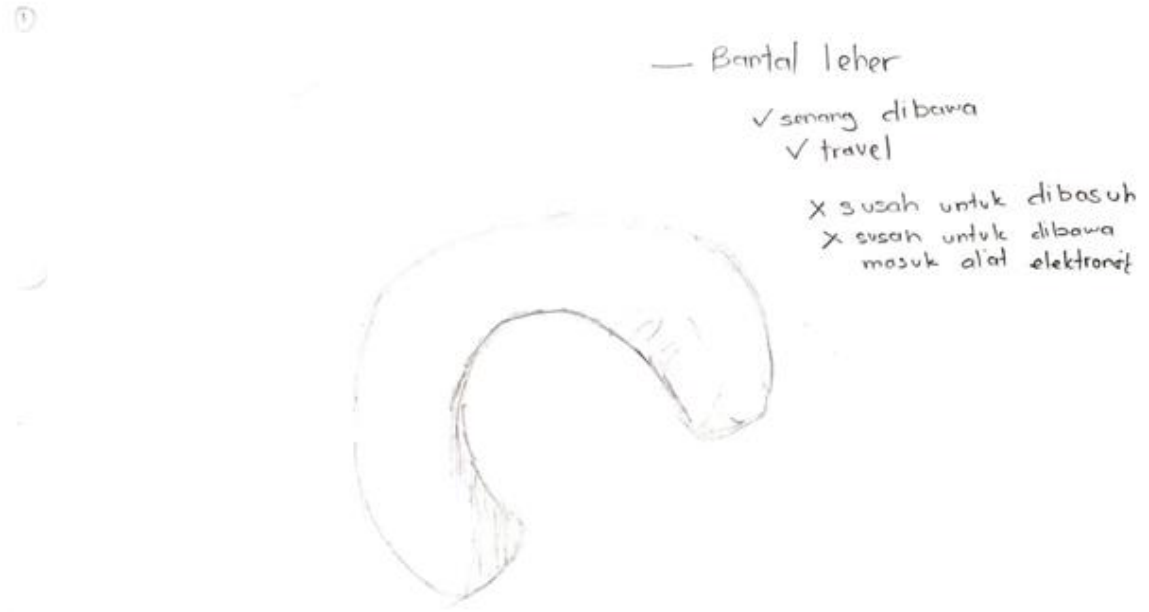
SalahSnooz, with its innovative design and potential to improve the spiritual and religious practices of individuals, has the potential to revolutionize the sleep aid market. The user-friendly, comfortable, and affordable product is suitable for people of all ages, making it a popular item on the market.

Sleep is crucial for maintaining overall health and well-being, yet many individuals struggle to achieve a sound night's sleep. In addition to negatively impacting physical health, sleep deprivation can also lead to difficulty establishing a consistent sleep schedule, resulting in difficulty waking up in the morning. Oversleeping can also cause feelings of guilt for missed prayers and a lack of focus during prayer, reducing an individual's spirituality. [3,4,5]

Addressing these issues, SalahSnooz is a novel product designed to help individuals who find it challenging to wake up in the morning and maintain focus during prayer. The pillow features an alarm clock or vibration mechanism that gently and effectively wakes the user up. The product is user-friendly, comfortable, and cost-effective, making it suitable for all ages. With 35% of American adults reporting poor sleep quality and 20% stating they don't get enough rest, SalahSnooz has the potential to revolutionize the sleep aid market. Additionally, with 63% of adults worldwide identifying with a religion, products like SalahSnooz that can aid with prayer focus and reduce guilt for missed prayers have a broad market appeal.[6]

INNOVATION DEVELOPMENT

Sketches:



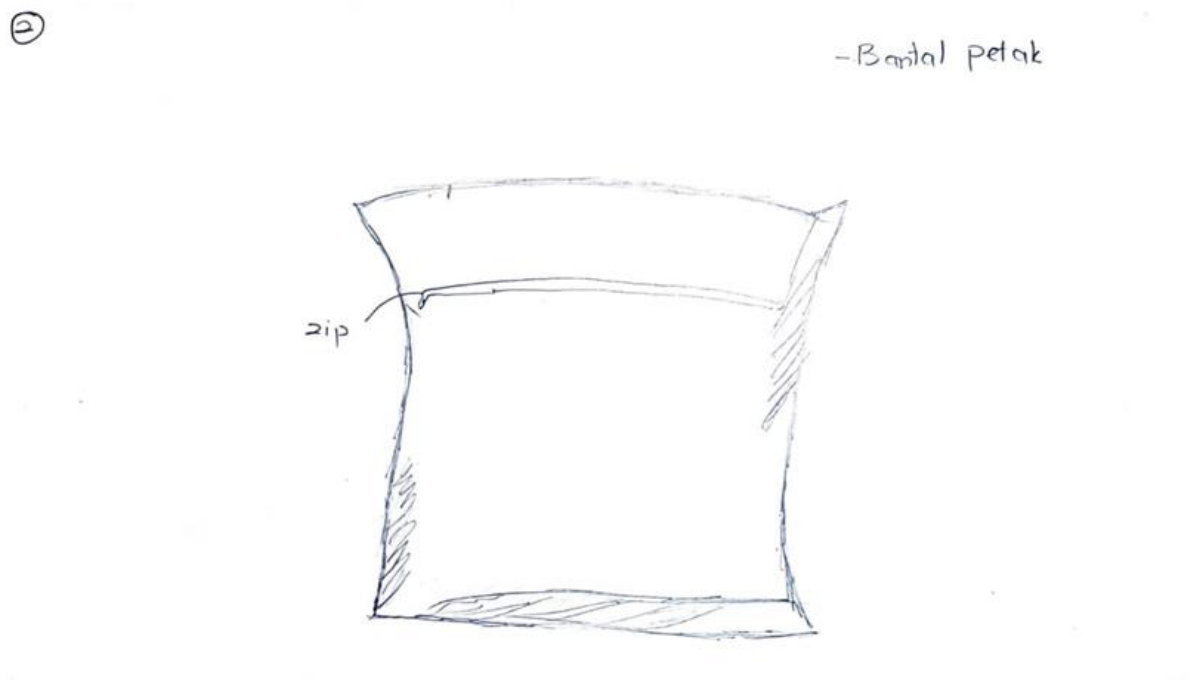


Figure 1: Pillow sketch

ArduinoCircuit:

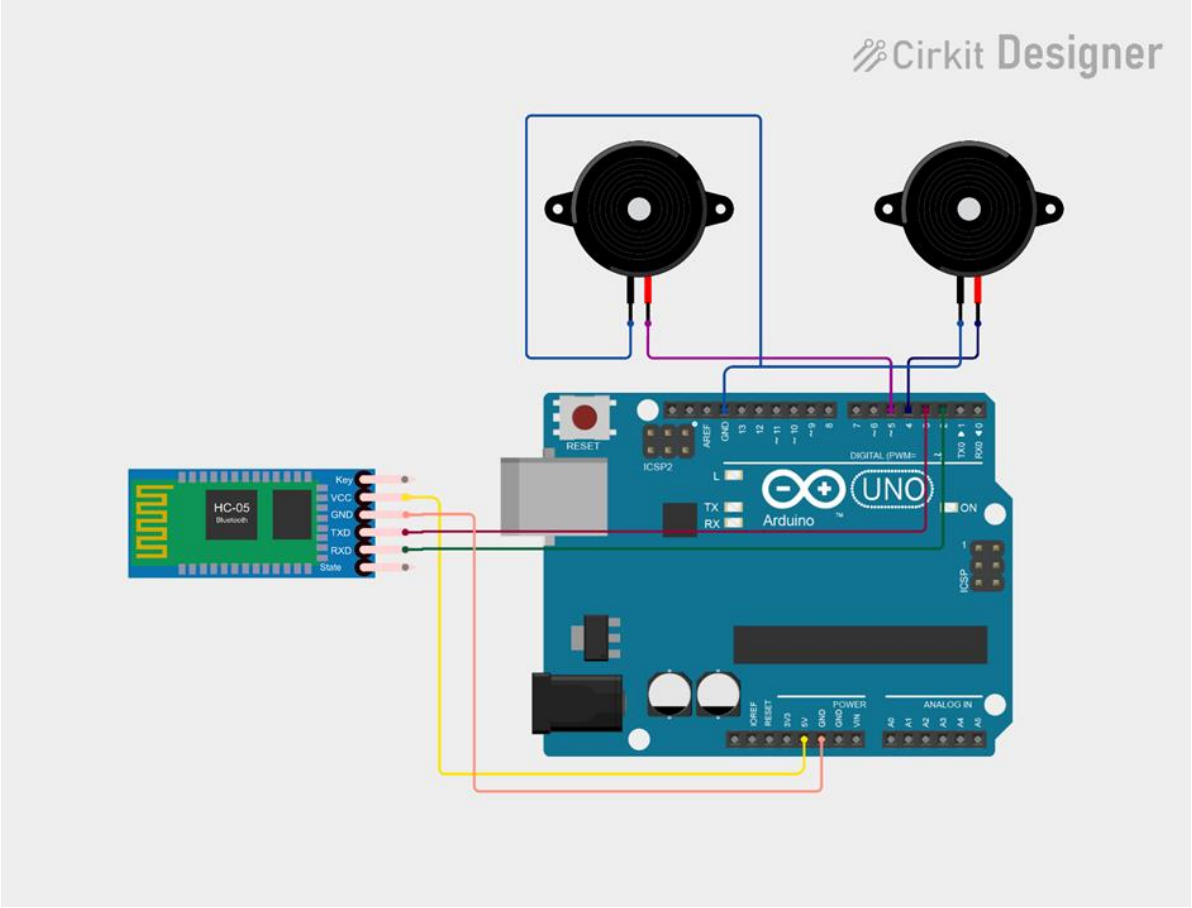


Figure 2: Arduino Circuit

Application Development:

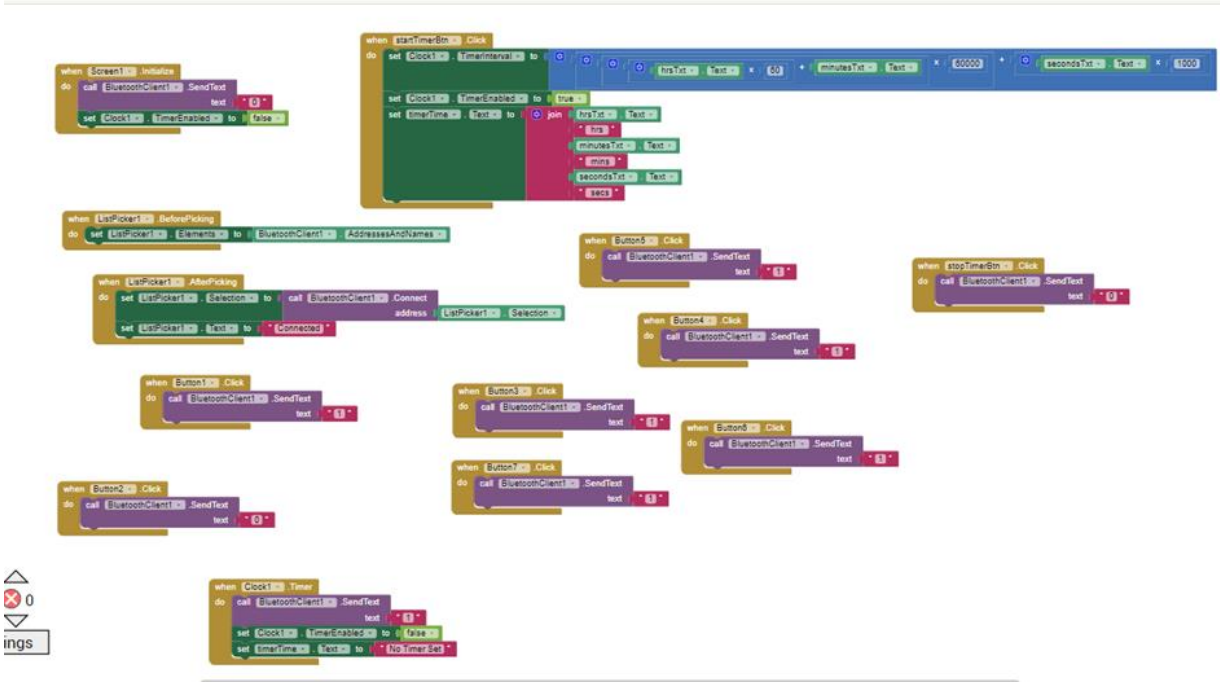


Figure 3: Application Development

Coding for application:

BLUETOOTH_CTU

```
#include <SoftwareSerial.h>

/* Create object named bt of the class SoftwareSerial */
SoftwareSerial bt(2, 3); /* (Rx,Tx) */

const int buzzerPin1 = 4; // set the first buzzer pin
const int buzzerPin2 = 5; // set the second buzzer pin

void setup() {
  bt.begin(9600); /* Define baud rate for software serial communication */
  Serial.begin(9600); /* Define baud rate for serial communication */
  pinMode(buzzerPin1, OUTPUT); // initialize the first buzzer pin as an output
  pinMode(buzzerPin2, OUTPUT); // initialize the second buzzer pin as an output
}

void loop() {
  if (bt.available()) /* If data is available on serial port */
  {
    char c = bt.read(); // read the incoming data from Bluetooth module
    Serial.write(c); /* Print character received on to the serial monitor */
    if (c == '1') {
      digitalWrite(buzzerPin1, HIGH); // turn on the first buzzer
      digitalWrite(buzzerPin2, HIGH); // turn on the second buzzer
    } else if (c == '0') {
      digitalWrite(buzzerPin1, LOW); // turn off the first buzzer
      digitalWrite(buzzerPin2, LOW); // turn off the second buzzer
    }else if (c == '2'){
      delay(10000);
      digitalWrite(buzzerPin1, HIGH); // turn on the first buzzer
      digitalWrite(buzzerPin2, HIGH); // turn on the second buzzer
    }
  }
}
```

Figure 4: Application's coding

COMMERCIAL POTENTIAL

Our objective in developing this product was to create a solution that would benefit individuals of all ages and social classes. Our product is affordable, with a reasonable price of RM50, making it accessible to everyone. Despite its low cost, the product's comprehensive functions make it a valuable investment for anyone looking to improve their sleep schedule and prayer routine. With our innovative product, users no longer need to worry about waking up late, missing prayer times, or struggling with irregular sleep patterns. Our product is designed to effectively address these issues and provide a solution that is helpful for all.

Cost Of Material Used:

Material	Price (RM)
Pillow	7.00
Bluetooth Device	10.00
Arduino Set	25.00
Battery	3.50
Buzzer	3.00
Total price	43.50

Table 1: Price material used

Profit Margin

$$\% \text{ profit} = \frac{\text{Selling price - Price cost}}{\text{Price Cost}} \times 100\%$$

$$= \frac{\text{RM 50 - RM 43.50}}{\text{RM 43.50}} \times 100\%$$

$$= 15\%$$

CONCLUSION

To sum up, Salahsnooz is a highly effective product that successfully meets its objectives of helping people wake up on time. Looking towards the future, we plan to explore the potential of developing an application that can be downloaded on electronic devices, allowing us to expand our reach to an international audience.

We also plan to seek advice from the Malaysian Industrial Research and Standards Institute (SIRIM) to ensure that our product meets all safety standards, thereby increasing consumer confidence in our brand. Additionally, we aim to diversify our pillow designs, offering a variety of sizes to cater to different preferences. Finally, we are committed to replacing the alarm (buzzer) with a motor to reduce noise pollution and introduce a vibration function that gently wakes the user without disturbing those around them.

ACKNOWLEDGEMENT

First and foremost, we express our deepest gratitude to Allah S.W.T for His abundant grace, which has enabled us to successfully develop our product. We are also immensely grateful to our parents for their unwavering support, both financially and emotionally, throughout the entire production process. Additionally, we extend our heartfelt thanks to our lecturer, Ustazah Norakmal, for providing us with invaluable guidance and support throughout the development of our product. We also want to express our appreciation to our housemates for their willingness to dedicate their time and energy towards helping us brainstorm ideas and find solutions to any challenges that arise. Lastly, we would like to extend our sincere thanks to all those who have contributed to our success. Thank you very much for your help and support.

REFERENCES

[1] Rawashdeh, M., & Mohannad Rawashdeh », M. A. (n.d.). *Arduino AND Bluetooth HC-05 Connecting Easily*. Instructables. https://www.instructables.com/Arduino-AND-Bluetooth-HC-05-Connecting-easily/

[2] *BANTAL TUNGKU ELEKTRIK / TUNGKU PANAS*. (n.d.). BANTAL TUNGKU ELEKTRIK / TUNGKU PANAS. https://www.marshaena.com/bantal-tungku-elektrik-tungku-panas?limit=75

[3] Web, P. (2023, March 17). *Tidur Berkualiti Untuk Kesihatan*. Tidur Berkualiti Untuk Kesihatan. https://htapah.moh.gov.my/v1/index.php/my/menu-artikel-kesihatan/26-kategori-artikel-kesihatan/115-tidur-berkualiti-untuk-kesihatan

[4] K. (2021, February 1). *Aniqma optimis lahirkan jutawan jual bantal*. Kosmo Digital. https://www.kosmo.com.my/2021/02/01/aniqma-optimis-lahirkan-jutawan-jual-bantal/

[5] *How to concentrate in Salah? (Dos and Don'ts)*. (2021, December 15). Faith Consulting. https://faith.consulting/blog/how-concentrate-salah-dos-and-donts

[6] Sievers, M. (2021, February 17). *12 Different Types of Pillows for Every Sleeping Position | Casper Blog*. Casper Blog. http://casper-blog-2020.flywheelsites.com/different-types-of-pillows/

[7] Times, I., & Herdyanto, A. (2023, March 16). *Cara Membuat Aplikasi Android, Ini 9 Langkah Mudah yang Bisa Kamu Coba*. IDN Times. https://www.idntimes.com/tech/gadget/abraham-herdyanto/cara-membuat-aplikasi-android

[8] D. (2016, February 29). *Arduino and HC-05 Bluetooth Module Complete Tutorial*. How to Mechatronics. https://howtomechatronics.com/tutorials/arduino/arduino-and-hc-05-bluetooth-module-tutorial/

Hajj Board Game

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ABSTRACT

The learning process becomes more challenging day after day. As for the children, early-stage learning can be a hustle with lots of words to be read and understood. When it comes to learning about Ibadah in Islam, especially about Hajj can be very difficult for the children and the students as there are a lot of processes and steps to be understood and remembered. Apart from that, learning the Hajj can be quite boring with the old-school methods of learning as we are dealing with the children and the students who would pay attention to something for only a short time. Hence, we came up with a great solution with the creation of this Hajj Board Game. The objectives of this game are to attract children and students to learn about Hajj, also making it simpler for teachers to explain the topic to students and provide youngsters another way to fill in their free time with something beneficial like playing our board game. The process of making this project started with some library research on how the youngsters' learning can be super effective. The rough model was sketched, then we printed out the sketch and started to build our board game model. Our Hajj board game is very affordable. It can be bought not only by the students but also teachers and parents as a teaching tool. Therefore, the Hajj Board Game can be a gamechanger on how the Ibadah could be taught as it is not only fun to play but also informative.

Keywords: Hajj; board game; education; students; parents

INTRODUCTION

Hajj from syarak perspective means visiting *Baitullah Al-Haram* at certain times (in the month of *Zulhijjah*) by performing all of the obligatory Hajj. Hajj becomes compulsory to all *mukallaf* who are capable of once per life. There is one of advantages that told in a hadith:

From Abu Hurairah RA, Indeed, the Messenger of Allah SAW said: "Between one Umrah andanother Umrah wipes out the sins between the two, and a successful Hajj has no rewardexcept heaven." (Bukhari) [1,2]

Problem Statement

Even though hajj is compulsory to Muslims that are in good health and have enough money, this does not become the exemption for others to know and learn about Hajj. This should be exposed to the Muslims community since childhood. [3,4]

There are few problems that our Muslims community faced regarding Hajj. First and foremost, Hajj has a lot of information that all the Muslims need to understand. The Ministry of Education has provided us with a syllabus about Hajj but it is very difficult to memorize

and understand without practical or simulation. Hence, most of the students will just memorize the topic blindly without even understanding it.[

Secondly, we are concerned about how education is delivered. Each level of age has its own way of learning, and we are focusing on the knowledge development towards students andchildren. Children normally love to play. Therefore, we need to find a way to combine elements of education and game to make sure the learning process is more interesting and fun.
Lastly, parents nowadays are too busy and do not have much time to spend with their kids. Therefore, it is concerning that the parents might be unable teach them about Al-Quran and Ibadah due to the lack of time. Therefore, we are very dedicated to make sure that younger generations must be exposed to the Al-Quran and ibadah earlier in life. [5,6]

Objective

- To help teachers make the learning of Hajj topics more interesting.
- To make sure that the students and children can enjoy playing board game while learning.
- To help the students to memorize the verses of the Quran.

Motive of production

- To make the learning process more fun.
- To attract youngsters to understand how to do Hajj correctly by doing the practical in the board game.

INNOVATION DEVELOPMENT

There are five pillars of Islam and one of them is Hajj. One of the importance of Hajj is that our sins can be purified and can be forgiven by Allah if it is done with a sincere heart. With Hajj, Muslims can strengthen their Iman and Taqwa to Allah. Hajj will need to be done in Mecca at a specific time. There are a lot of things that Muslims need to do while performing their Hajj. Therefore, Hajj Board Game is an innovation created by combining multi-player board game and a small-scale simulation of Hajj. This product contains elements same as the traditional board game with a few additions of modern features. This is to make sure that the product is relevant to be played throughout the generation.

Product's Inventive Features

This product is a hybrid board game; a combination of multi-player board game and simulation which are played simultaneously. The board game will determine the movement of the player on the simulation site. It is featured with a few conventional board game features and some latest features. For instance, the use of dice is still the signature element for the board game.

Our board game contains a few surprise elements on the board which are Surprise Box, Hafazan Box and Pop Quiz Box. This box has its own consequences if stepped on. There is also the punishment box where players will need to pay something as a punishment. Since the product is a hybrid board game, when a player steps on certain boxes in the board game, they can move their piece at the simulation site. The rules and instructions

on how to play and how to win this game will be shown after this.

As for the modern features, task cards like Hafazan Cards will have a QR-Code on each of them which will direct the player to an online Al-Quran website equipped with audio and translations of the verse. Other than that, we have prepared a QR-Code for the Judge that will bring the Judge to a spreadsheet which is made specifically for recording the player's progress. Every QR-Code can be accessed with any device anywhere and anytime.

The Product's Design

Hajj Board Game is made from a good quality mounting board meanwhile the simulation site was made by mounting board and clays. Mounting board, also known as a foam core or backing board, is a sturdy, rigid board made of thin foam sandwiched between layers of paper. It offers a flat surface for mounting art and supports the artwork within the frame. Hence the product will not break easily.

The design of the board was our own, which made our product an original product. The design was drawn in an illustrating application called Flip-a-Clip. After being drawn, the model was made with the use of coloured papers and the mounting board.

How to Play

1. Players must draw the dice.
2. Person who gets the highest dice pips will start first followed by the rest with the lowest pips as the last person to start.
3. The player will be provided with 5 goat cards.
4. Start the game.
5. Player 1 draws the dice and moves accordingly.
6. A player can start the Hajj Step once they land on the correct box according to the sequence of Hajj.
7. If a player lands on a white box with a big question mark '?', the player needs to take the Surprise card and do whatever the card says.
8. If a player lands on a green box with opened book in the middle, the player needs to pick a Hafazan Card and recite the verse and any surah requested.
9. If a player lands on a Pop Quiz Box, the player needs to pick a Pop Quiz Card and answer the question in the card.
10. If a player land on interdiction of Ihram boxes, the player has to pay 1 goat.
11. The player will not be allowed to move for a round if they land on "Hammer of Justice" Box.
12. The first player to complete the Hajj sequences will be awarded as the winner.

Rules

1. The maximum number of players that can play is 5 people. 4 persons can play while another one will be the judge.
2. If a player lands on any Quest Boxes, the Judge will be the one who picks and reads the card accordingly.
3. If the player fails to answer or do the task, the player cannot move for a while.
4. If a player does not remember the surah and the verses requested, there will be QR Code at the back of the card.

5. If a player land on interdiction of Ihram boxes, players need to pay Dam to the judge, with 1 Goat Card.
6. If a player is out of Goat Card, the player will be eliminated.
7. The Judge will tick the checklist for every player who does Hajj Sequence correctly.
8. The Judge will announce the winner once there are players who complete the Hajj Sequences.



Figure 1: The early drawings of the board game

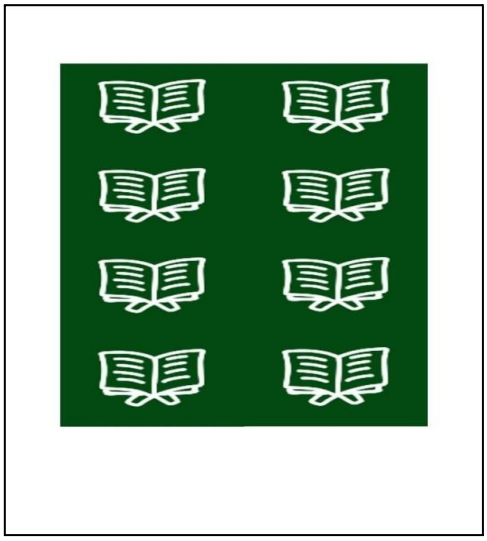


Figure 2: The Hafazan Cards Design

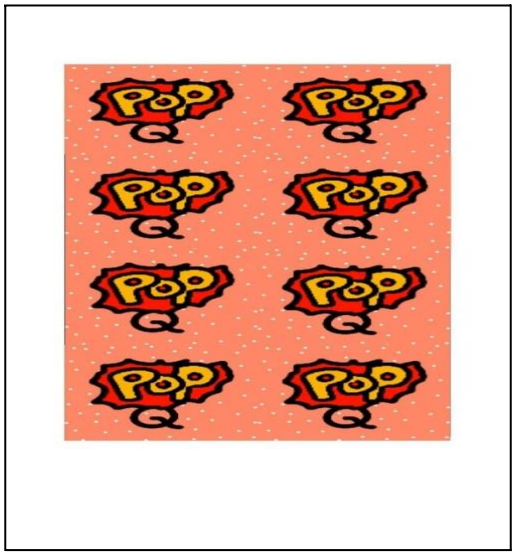


Figure 3: The Pop Quiz Card design

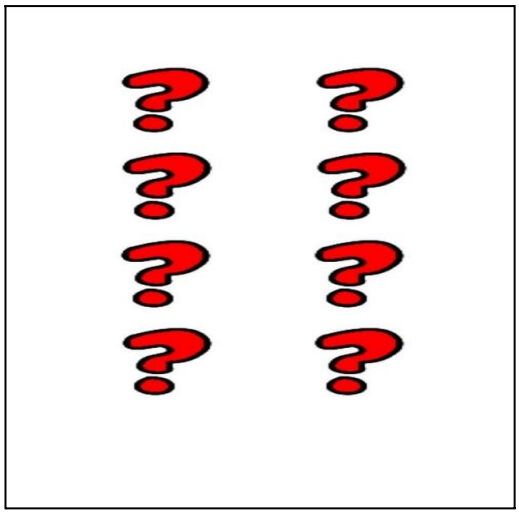


Figure 4: The Surprise Cards Design



Figure 5: The model was being made



Figure 6: The Board Game (Colourful one) & The Hajj simulation site (Yellow one)

COMMERCIAL POTENTIAL

Every product has its own commercial value and so does our product, which is Hajj Board Game. Our product has unique play style, user friendly and made using low-cost material.

First, our Hajj Board Game structure is similar to any board game while the design on it is authentic as we designed it ourselves. We also added special features and changed the play style which makes our board game different from any board games out there. We used a rectangle mounting board and we divided it into two. The right side is the board game, and the left side is the simulation of the *rukun* of hajj which will appear in 3D model. Players need to complete the *rukun* of hajj on the simulation side to win the game. Next, on the board game, normally money will be used as a currency, but in our board game we use goat as our currency. Each player will be given 5 goats at the start of the game. If any player lost all their goats, they will lose. The purpose of the goat is to pay the fine or also known as "*dam*" in this game. We also added *hafazan* cards, Hajj pop Quiz card and Surprise Card. So, if any players land on the specific box, the judge will draw the cards and the player needs to do the task which will be read by the judge.

Other than that, our product is user-friendly. As mentioned above, the simulation part of the board game will have the *rukun* of hajj that appears in 3D model. The model can be disassembled when the game is finished. This will make it easier for players to store the board game and help save space. Not just that, parents also can play puzzle with their children by removing all the 3D objects and then ask their children to place the object on the correct place. Therefore, children can learn which one is *Kaabah, Jamrah Kubra* and so on.

Moreover, our product uses low-cost material. We use mounting board as our base and the 3D models. Then, the 3D models such as the mountain was covered with clay to make the mountain looks real. Our board game, pop quiz cards, surprise cards, *hafazan* cards and goats were printed out on paper. We also attached Velcro tape at the bottom of the 3D models to make them easier to remove and store.

Lastly, our target customers are parents and schools. This is because parents can play this board game with their children. Thus, they can expand their knowledge about *hajj* and spend their quality time together. Next, schools are also our target customers. The topic of Hajj is taught in secondary schools. However, it contains a lot of information and the students struggled to understand most of it. With the innovation of this kind of board game, we hope that it will make the learning process more efficient and can attract the students' interest.

Selling Price

Table 1: The materials being used and the cost

Bil.	Item	Quantity	Price per unit (RM)	Price cost (RM)	Selling price (RM)
1.	Mounting board	2	2.50	5.00	10.00
2.	A4 paper	1 set	4.95	4.95	10.00
3.	Velcro tape	1	3.00	3.00	8.00
4.	Clay	1	2.50	2.50	7.00
5.	Dice	2	0.75	1.50	3.90
6.	Tokens	8	2.50	5.00	7.00
JUMLAH				**RM 21.95**	**RM 45.90**

Other cost (Printing cost): RM6.00

Price cost RM 21.95
+Printing cost RM 6.00
Total RM 27.95

Profit Margin

$$\% \text{ profit} = \frac{\text{Selling price - Price cost}}{\text{Price cost}} \times 100\%$$

$$= \frac{RM45.90 - RM\ 21.95}{RM21.95} \times 100\%$$

$$= 109.11\%$$

CONCLUSION

In conclusion, Hajj Board Game offers a unique and engaging approach to learning, and memorizing the steps of performing hajj and short surah in juz 30. Our innovation "HajjBoard Game" has the potential to make a positive impact on education especially in religious subjects. This project provides an interactive way to learn and retain knowledge about hajj while promoting teamwork and socialization.

However, there is always room for improvement. One area where we could focus our effortsis to make the board game more accessible to players even without an internet connection. This is because we planned to promote our product to public schools nationwide. Even though it is good to use the technology in learning, it will be inconvenient for schools to provide an internet connection just for students to learn about Hajj. Additionally, we need to find a way to make the equipment for the board game portable so that people can play the game at any given place and time.

We could also consider incorporating more advanced concepts for older players or creating different versions of the game for different age groups as older people have a different mental capacity than younger kids. The steps for the older people's version must also be more precise as they are more likely to perform Hajj. [7,8]

Overall, we are excited about the potential of Hajj Board Game and we are committed to improve and expand our game to make learning even more enjoyable and effective.

ACKNOWLEDGEMENT

We would like to take this opportunity to express our heartfelt thanks and recognition to all theindividuals who contributed to the development of Hajj Board Game, firstly to our mentor in this project, Ustazah Norakmal Abdul Hamid who helped us by giving advice and monitoring our progress from time to time. Also, our members in this project including Haikal, Awang, Hakeem and Hakimi. Your expertise, hard work, and commitment were invaluable in bringing our vision to life.

We would like to recognize our talented designer, Haikal who took his time to sketch the board's design by hand. Not forgotten, other team members who planned the board's gameplay mechanics and its rules as well as instructions to make this project happen. We would alsolike to thank the visitors and judges who visited our Karnival Sains & Teknologi Islam (KSTI 2023) booth on 11th March 2023 and provided feedback on the game, and lastly our mentor who ensured that the board game's content was accurate and aligned with educational standards.

We could not have done it without each and every one of you, and we are grateful for your contributions to Hajj Board Game's success.

REFERENCES

[1] Insanittaqwa, V. F., Kuswardayan, I., & Sunaryono, D. (2014). Game edukasi 'simulasi haji'menggunakan ren'py pada perangkat android untuk simulasi perjalanan ibadah haji. *Jurnal Teknik ITS*, *3*(1), A52-A57.

[2] Mufti Wilayah. (2017, August 9). *BAYAN LI AL-HAJ SIRI 2: PENGERTIAN HAJI DAN UMRAH SERTA PERBEZAANNYA*. Pejabat Mufti Wilayah Persekutuan. https://muftiwp.gov.my/artikel/bayan-li-al-haj/724-bayan-li-al-haj-siri-2-pengertian-haji-dan- umrah-serta-perbezaannya

[3] *Rukun Haji Dan Wajib Haji*. (2019, December 29). MyWilayah.com. https://www.mywilayah.com/2019/12/rukun-haji-dan-wajib-haji.html?m=1

[4] Syafi-Q. (2011, October 25). *Umrah Dan Haji*. Shafiqolbu. https://shafiqolbu.wordpress.com/haji-dan-umrah/

[5] Awi, N.A.L. & Zulkifli, H. (2021). Amalan Kreativiti Guru Pendidikan Islam Dalam Pembelajaran Abad ke 21. *Asean Comparative Education Research Journal on Islam dan Civilization* (Acer J) Eissn 2600.769x, 4 (1), 40-54.

[6] Tan Wee Hoe. (2016). Gamifikasi Dalam Pendidikan. Tanjung Malim: Terbitan UPSI.

[7] Yoon, B., Rodriguez, L., Faselis, C. J., & Liappis, A. P. (2014). Using a board game to Reinforce Learning. *The Journal of Continuing Education in Nursing*, *45*(3), 110-111.

[8] Zainuddin, N., Rahman, A.A., Sahrir, M.S., Abd Khafiz, H. (2019). A Study on the Effectiveness of Global Zakat Game (GZG) as a Zakat Teaching and Learning Tool. *International Journal of Academic Research in Business and Social Sciences*, 9 (3).

Fun Vector Learning Kit

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ABSTRACT

As time goes by, the youth keep avoiding pure subjects, especially Physics. The complexity and highly meticulous working solutions involved causes it difficult to understand. This project's main focus is to enhance the understanding of vector concepts among students and pique their interest in studying physics. When getting ourselves used to the fundamental concepts of physics such as forces and motion, understanding the basic concept of vectors play an extremely important role. Being able to solve vector-related problems will assist them in scoring physics, since about half of the syllabus requires vector solving skills. Because of this, innovating a simple, low-cost but mind-training game will get students to be invested in learning physics. Fun Vector Learning Kit, consisting of vector board, rubber lines, question cards which is guaranteed to allow students to enjoy learning vectors. It is played among 3-4 members. This innovation is also believed to change the way students see physics as they would go through the learning process independently without guidance from educators. This is a good step to reel in more Science and Technology students, especially those who take physics subjects and ensure a good commercial success in the market as it is suitable for students from secondary school to pre-university and STPM students.

Keywords: Physics; vector; Fun Vector Learning Kit; students; innovation

INTRODUCTION

Physics is one of the vital parts of sciences that demands the learners to master the important theory, concept, and consumption of formulas in order to solve the problems related to daily life. As we know, the basic concept of physics such as force and motion needed the usage of vectors because there are two fundamental elements in vectors which are magnitude and direction. Although students may experience variety theory of vector, yet they still is having a hard time in imagining and applying vector concept in daily life. (Oh Hoon Kwon, 2011).

When students are able to completely understand vector, this can help them to determine the major problem in another case of physics as physics depends on magnitude and direction and this also results in the students to manage getting a good grade for their examination. Fun Vector Learning Kit is an interactive and jest board game that lets the players memorize physics with enjoyment. Besides, this board game is also vital in strengthening academic performance particularly in vector. Until this day, the tough learning system has become a challenge for students to adapt. For instance, long-written textbooks with combinations of many types of formulae are making students feel tension, as well as uninterested and waste of time as they learn nothing from it.

Therefore, creating an exciting yet challenging educational game to be played with friends or relatives can provide the students with a better environment for learning processes. This innovation may also lead the player to have a positive perspective toward physics. Moreover, the idea of board games is proven to bring many advantages. The benefits are the players can enhance their brain functionality and creativity due to this game's inventive way of solving a problem. It also reduces stress and builds self-confidence when students start to get the big picture of physics concepts. Since this is an interactive game, the players may boost their friendship as well as communication skills. Looking toward the academic aspects, this innovation helps the students to understand more about coordination and calculation in mathematics. Other than that, games and simulations have been proven to show mixed effects for many sectors such as student performance, engagement, and studying motivation. (Dimitrios Vlachopoulos, Agoritsa Makri, 2017).

Hence, the main objectives of this innovation are:

- To increase the understanding of vector in students.
- To give an exciting and effective method for students to learn vector.
- To become an educational material for educators to teach easily.
- To change perceptions of students to learn physics even during leisure time.

INNOVATION DEVELOPMENT

This vector learning kit innovation is complete with fun compartments to ease the process of learning vectors in a more appealing way. First of all, the vector board has constant grids of boxes. This is to ensure the rubber bands representing vectors with varieties of colours match the coordinates, length and unit. It is also to make sure the rubber band used as the vectors look tidier and does not collide with another vector. As we all know, vectors are two continuous lines in terms of x and y, and the resultant vector is the line connecting them, which is the line from the beginning of the first line to the end of the second line. Take an example, let say the first line, x is blue and the second line, y is orange, the resultant vector is a mixture of blue and orange rubber bands. As a result, the players that use this vector kit can imagine the vector effectively and to tell the vectors' parts apart.

Besides that, this vector kit has a set of cards to be used for the minigame of the kit. The cards come in three colours, which are green, yellow and red. The colours represent the difficulty of the questions given for the students to solve. The higher the difficulty of the question, the higher the marks given to the students. Running a game with questions at different difficulty help students to practice their minds to get used to answer mind-boggling questions similar with examination. The cards also h ave two features namely 'CHANCE' and 'FATE'. Some question cards are randomly labeled with 'CHANCE' with an envelope image or 'FATE' with a bird image. It is up to the players to pick one of these cards and answer the questions afterward.



Figure 1: Innovation Prototype



Figure 2: Chance and Fate Card

COMMERCIAL POTENTIAL

This Fun Vector Learning Kit is as enjoyable as it is educational, especially to the target audience that are school students and pre-university of matriculation students as they can be exposed to problems involving physics. The benefits that students can reap from this learning kit include problem-solving abilities that will make the students to quicken their thinking pace to complete the question answering tasks involving calculation. The questions are composed of three difficulty tiers, namely easy, medium and hard. Our target audience are precisely students that pursue science courses that include Physics, as it is a highly compulsory subject to pass. It will be a great honour for us had the Physics Department to purchase this innovation and utilise it as a form of educating to attract more students to be inclined in bettering their understanding the basic concept of vectors. For other potential markets, we also have Petroscience as our next-level target market, considering it is a discovery centre that harbors a lot of science workshops. This vector learning kit is suitable for people aged 16 and above.

Due to the fact that most students find physics to be too difficult and find it difficult to understand the lecturer's or teacher's lessons, students are frequently bored during class. As a result, they may give up since they are unable to grasp the lecturer's or teacher's main points. As a result, they will suffer if they lose interest in studying. In order for the students to pay attention and maintain their focus on the material, they need to play something enjoyable but

tough with their peers. Experts have also found evidence to support their claims that the game helps pupils maintain their attention long enough to learn more effectively and get higher results (Lepper and Cordova, 1992). There is only one game board, and the questions on the game cards vary in difficulty. Based on the board's quality, the quantity of nails used, the type of wood used, the rubber band used, and the type of paper used, the total cost of the game is RM45. Four players can play on one board. It relies on the proportion of the discount to determine whether the promotion can be made during the Science Carnival. Some individuals may be eligible for special discounts, such as Physics lecturers and employees who use this game as a learning tool and who will utilise it in class. Facebook, Instagram, Twitter, Shopee, and Lazada are just a few of the sites we may use to advertise our goods.Because most of the audience is made up of students who are studying science subjects and specific lecturers who teach physics, bookstores, universities, and secondary schools are the best places to conduct marketing campaigns.

Budgets and Costings

Material	RM per unit	Quantity	Cost (RM)
Box nails	0.10	72	7.20
Art rubber bands	0.028	875	24.50
Wooden board	6.80	1	6.80
Papers	0.05	30	1.50
Total			40

Profit Margin

Sale price = RM 60
Cost price = RM 54
Profit percentage = $\frac{45-40}{40} \times 100\ \%$
$= 12.5\%$

CONCLUSION

The main objectives of this innovation are:

- To increase the understanding of vector in students.
- To give an exciting and effective method for students to learn vector.
- To become an educational material for educators to teach easily.
- To change perceptions of students to learn physics even during leisure time.

In conclusion, this fun vector learning kit aided the players to understand vector with joy and excitement. The use of vector learning kit as a board game is able to yearn the attention of not only students, but also educators due to its effectiveness and innovative idea. This learning kit can be used as a teaching material to give student a clear image of direction and magnitude which are the crucial elements in vector. The players may also spend their free time wisely by playing this board in a fun way to enhance their understanding. The improvement that can be

made for future development is we can try to develop an application so that this game can be played digitally via smartphones and laptop. We also wish this learning kit can be commercialized as a main academic tool to educate students about vector easily.

ACKNOWLEDGEMENT

First and foremost, a big expression of gratitude to Allah for enabling us to do our innovation project easily until we successfully completed this innovation to the end.

A huge and special thanks is also given to the people and relatives that showered us with the never-ending support and encouragement to keep us moving forward and give our best efforts. No words can express how grateful we felt, to be able to complete this project before its due. Moreover, we would also want to express our gratitude to Universiti Teknologi Mara (UiTM) for sponsoring us to join Creations de UiTM 2023.

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REFERENCES

[1] Dimitrios Vlachopoulos, Agoritsa Makri (2017). The effect of games and simulations on higher education: a systematic literature review
[2] Pat S., Youth Services Assistant, Bensalem Branch (2019). Benefits of Playing Board Games. https://buckslib.org/benefits-of-playing-board-games/
[3] Oh Hoon Kwon (2011). Student Approaches and Difficulties in Understanding and Using of Vectors
[4] B R A Latifa, E Purwaningsih and S Sutopo (2018). Identification of students' difficulties in understanding of vector concepts using test of understanding of vector
[5] https://nrich.maths.org/2390, Toni Beardon (2004), An Introduction to Vectors
[6] Reza B., J. Technol. Innov(2007).Evaluation of Commercial Potential of a New Technology at Early Stage of Development with Fuzzy logic. https://www.jotmi.org/index.php/GT/article/download/art65/429/547
[7] Megan Zander (2019): The surprising benefits your kids get from playing board games. :https://www.scholastic.com/parents/kids-activities-and-printables/activities-for-kids/arts-and-craft-ideas/benefits-board-games.html
[8] Ric Sweenay (2022): Why Students Get Bored in Class and What to Do About it: https://www.mheducation.com/highered/ideas/instructor/why-students-get-bored-in-class-and-what-to-do-about-it

Scrabble Jawi

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ABSTRACT

As what we have been told, the use of Jawi has started for a long time ever since the previous era and has become the identity of the Malay community in Malaya. Long time ago, Jawi was usually used in various fields, especially in official documents such as Hukum Kanun Melaka dan declaration of Malaya's Independence in 1957. This shows how useful Jawi was during that time. However, today's Jawi has not been used a lot and can be said it has slowly faded away. On that matter, we got an idea on ways to nurture the use of Jawi in today's generation. The purpose of this product, 'Scrabble Jawi' being created is because there are several students that are still less proficient in Jawi. This is due to the usage of Jawi in Pendidikan Islam textbook nowadays which makes students who are still less proficient in Jawi left behind because they find it difficult to read and develop a better understanding. Some of the objectives of this 'Scrabble Jawi' is to help students deepen their Jawi proficiency and give encouragement to students to sustain the use of Jawi until the next generation. Besides that, to increase students' intelligence as well as train student's skills in reading and writing using Jawi especially in Islamic Education's subject. Furthermore, applying and elevating the use of Jawi in daily life. This product only uses materials that are easy to find such as board and colour papers. The affordable price also proves that this product is open and suitable to anyone. In short, this product has many advantages like attracting students' interests in learning Jawi, encouraging two-way interaction between teacher and students and helping in increasing Jawi proficiency level which is increasingly worrying nowadays. Therefore, with the creation of this product, students are able to show their interest towards Jawi.

Keywords: Jawi writing; Scrabble Jawi; two-way-interaction

INTRODUCTION

Jawi writing in ancient times was one of the most powerful writings, so the governments of Western countries needed to learn the writing for intermediate use, especially for dealing with letters to Malay kings. The role of Jawi writing at that time was so broad that the governments of foreign countries needed to learn the Jawi script for some business. The importance of Jawi writing at that time is the same as the use of English as an intermediate language nowadays.

However, we can see that most of the current generation still does not realise or know that the Malay community once upon a time had a language that became its identity and had its heyday in some parts of the country. The fate of the Jawi script, which became the identity of the Malay community, began to disappear when a reform in national education was carried out by the Minister of Education in 1966, who changed the use of the Jawi script to the Rumi script. This issue can be proven in the subject of Islamic education in schools today. Awareness of preserving this Jawi script is still low, and it is not impossible if this script becomes extinct and

is no longer used at some point in the future.

Therefore, we have planned to create a game called "Scrabble Jawi." This game can be played anywhere, especially at school, during the teaching and learning process. This is to raise the name of Jawi among students. The students can increase their vocabulary in Jawi and train themselves to think more intelligently when building Jawi words. As we know, diversity in using teaching aids to create an environment that can attract students' interest is increasingly given priority now. In line with the needs and requirements of the Malaysian Education Development Plan (PPPM), which emphasises student development, innovation in the education system needs to be given due emphasis. We hope our objective will be achieved through this innovation project.

INNOVATION DEVELOPMENT

Based on several research and analysis, there are still many students who are still weak or less proficient in writing Jawi. This may be due to lack of exposure and teaching in Jawi, especially in school. The purpose of this product is to overcome the issue of Jawi mastery that has increasingly become worrisome among students nowadays. Next, this product can also be one of the ways to educate students learning basic Jawi writing so that it will not become extinct in future.

'Scrabble Jawi' is a product that is easy to create and suitable to be played by all levels of age as this product is able to help in sharpening one's mind as well as increasing the student's understanding in applying or constructing sentences using Jawi. This product only requires the use of a board that is light therefore it is convenient to carry around the product anywhere. Variety of colours are used to attract and boost students' mood, promoting them to display their creativity during the learning sessions. The diagram below shows the rough sketch of the product.

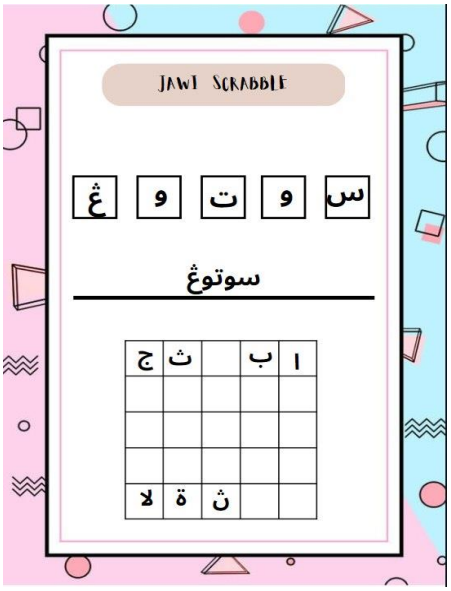


Figure 1: Jawi Scrabble

COMMERCIAL POTENTIAL

This teaching aid has a high commercial value especially in the field of education because this game is designed as one of the alternatives for teachers in teaching Jawi subjects. Not only that, this teaching aid also helps teachers to empower students' understanding of Jawi while increasing students' vocabulary and training them to think intelligently in producing words in Jawi letters. This product can be used as part of the learning and teaching process. In addition, this game is built in accordance with 21st century learning which encourages collaborative learning. This learning aid applied the student-centred concept while the teacher acts as a guide throughout the activity. The materials used to make Scrabble Jawi consist of materials that are easily available and the selling price of the product is also cheap and affordable so that everyone can afford it.

Selling Price

Table 1: Price of materials and product

No.	Material	Price (RM)	Price per pax (RM)
1.	Coloured paper	5.00 (40 sheet)	0.40 (3 sheet)
2.	Wallpaper	6.10 (5 metre)	2.80 (2.28 metre)
3.	Corrugated sheet	3.70	3.70
4.	Velcro tape	5.00	5.00
5.	Laminate	7.50	7.50
Total		32.30	19.40

Profit Margin

Profit = 30%
1.00 + 0.30 = 1.3
Net price = RM 19.40
Selling price = 19.40 x 1.3 = RM 25.22
Profit earned = 19.40 x 0.3 = RM 5.82



Figure 2: Jawi Scrabble example

Materials needed	Quantity used
Coloured paper	6
Wallpaper	1
Corrugated sheet	1
Velcro tape	1
Laminate	3

CONCLUSION

Thus, it is clear that this attractive Scrabble Jawi has advantages such as attracting students to learn Jawi and encouraging two-way interaction between teachers and students. This can help in cultivating the intelligence of the student's mind to build various words using Jawi letters. Furthermore, the level of proficiency of Jawi among today's students can be solved when there are teaching aids such as this Scrabble Jawi that can attract students to learn it. In Islam, seeking knowledge is a jihad in the path of God. Therefore, hopefully with our innovation that is Scrabble Jawi, we can attract students to learn Jawi because Jawi is also the identity of the Malay race that has been used for a long time.

ACKNOWLEDGEMENT

First of all, we would like to express our gratitude to God for his abundance and grace. We were able to complete this innovation research paper which is 'Scrabble Jawi' within the set time frame. We would also like to say a million thanks to Dr Noor Syahida Md Soh as our lecturer who has given us a lot of guidance in helping us complete this research work. In fact, a million thanks to the members of the group for their cooperation and commitment throughout our completion of this innovation research.

Finally, it is our hope that the innovative research that we have produced which is 'Scrabble Jawi' can benefit users so that we can both empower the use of Jawi. In addition, we also hope that this innovation can increase knowledge to produce excellent human capital. We also apologise in case there are any unintentional mistakes in this innovation research work. Thank you.

REFERENCES

[1] Ku Syafiq Ku Rozi. (2022). *Apa itu Pembelajaran Abad Ke-21?* https://relevan.com.my/2022/02/11/apa-itu-pembelajaran-abad-ke-21/
[2] Jawi: Tulisan Yang Dilupakan. (n.d.). https://solidaritas.my/jawi-tulisan-yang dilupakan/
[3] Osman Affandi. (2019). *Sejarah dan Evolusi Tulisan Jawi di Tanah Melayu.* https://iluminasi.com/bm/tulisan-jawi-sejarah-evolusi-dan-perkembangannya-di-tanah-melayu.html

Vector Hunt'S Game App

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ABSTRACT

This is a compilation of Vector Hunt Game's invention and introduction. This will help us understand an easier manner to comprehend vector-related things. Briefly, this effort was started at a time when it was evident that students, lecturers, and their grading had issues due to the pandemic. There is no other way to put it, but students find the subject of vectors to be very perplexing, especially those who have lost interest in the course material. The creation of graphics, range of solutions, and various levels might be able to ignite the target group's attention. Before we can successfully declare our prototype to be an app that can be utilized globally, there are a lot of ideas that we need to underline. We examined and talked about the innovation's commercial possibilities before we settled on the design of this prototype. We chose students and educators as our target audience to succeed in this project, and it goes without saying that we had to employ some expensive techniques. After the debate, we took this issue seriously in the hopes of catching the attention of individuals and organizations that could assist us in furthering the development of our project.

Keywords: Vector; Vector Hunt Game; students; prototype; development

INTRODUCTION

Innovation is one of the most important components of most academic institutions' efforts to attain their goals and objectives. It causes a change from traditional learning methods to more advanced ones. All of these tactics will make an effort to address questions that instructors regularly ask regarding the value of lecture results and the services offered by these organizations. The success of an academic depends on the development of qualities that foster creativity. Additionally, a conducive learning environment is needed in order for such innovators to succeed. Students must also devise strategies or practical techniques for differentiating priorities when it comes to resource allocation. The question of original models and theories of innovation, as well as their evolution, will be the main topic of this study. The paper will also address how the innovation process has an impact on pupils.

When students attempt to study and comprehend the concepts of vectors, they run into a number of issues. Students must first overcome the difficulty of comprehending the fundamental concepts of size and direction in vectors. They overlook the fact that a vector is a movement between two points where a vector quantity has both direction and magnitude. Second, issues here develop when students lose interest in studying the vector-based curriculum due to the unappealing images. This innovation not only adds fresh images but also different routes and difficulty levels for each question. Last but not least, the sources of vector learning may be limited and the questions may also not be updated, so with our Vector Hunt game, it will ease the path to better understanding.

In order to aid students in comprehending better concepts, we integrated our product, Vector Hunt game, which is based on the game of treasure hunting. Since PowerPoint would be a user-friendly application, it was chosen to produce this breakthrough. However, by using PowerPoint during the project's production, development costs might be cut, enabling this product to be distributed to the project's intended audience of students. We produced this prototype using Microsoft PowerPoint to communicate the specification and characteristics of our product since we need to broaden the scope and speculative nature of our ideas to capture the full attention of the students. We integrated our product, Vector Hunt Game, which is based on the game of treasure hunting, to help pupils understand topics more clearly. This innovation was made possible since PowerPoint is a user-friendly programme. However, production costs for the project could be decreased by using PowerPoint, allowing it to be distributed to the project's target audience of students. Since we needed to expand the scope and speculative nature of our ideas to fully engage the students, we created this prototype using Microsoft PowerPoint to illustrate the specification and qualities of our concept.

To comprehend the objectives of these developments, we can look at three mechanisms. By utilizing various teaching methods, such as the Vector Hunt Game, we hope to ignite students' interest in learning about vectors. Our next goal is to support lecturers and all teachers in their endeavors to teach. Thirdly, we examine the process of a student's grade, where these goals are concentrated to assist them in raising their marks. We need a quick way that is also engaging to make it better. We are aware that we are in a digital age. By creating this feature, we hope to apply the benefits of a technologically oriented educational system to it. It will start out as a prototype, but if it attracts interest from others, it may be developed further and turned into an app. Regarding Online Distance Learning (ODL), which has been going on for the past two years, it is obvious to us that innovation motivation happens when teachers struggle to instruct students who all live in different areas. We anticipate that these improvements will enhance the teaching and learning process on both sides. Students had a lot of difficulties learning, comprehending, and mastering the vector chapter as well. Therefore, we are hoping that by creating this Vector Hunt Game prototype, it can assist more students and professors in enhancing our educational system. This project was created particularly for students like us with the intention of preventing future issues.

INNOVATION DEVELOPMENT

PowerPoint was used in the design of Vector Hunt Game so that it would be a user-friendly app. However, by utilizing PowerPoint during the project's development, costs can be minimized, allowing the product to be distributed to the project's intended audience of students. Students can select the game's difficulty level based on their knowledge when they first start the app. They are given notes so they can identify the levels that are appropriate for them and correspond to their level of topic expertise.

Upon selecting the level, a map will show up. Even at an easy level, there are four alternative paths that contain various configurations of destinations that students must choose from. This is one of the application's distinctive features because it will assist users in gradually mastering the vector topic as they must accomplish four different activities in order to move on to the medium level. Students must master this method in order to comprehend the fundamentals of vectors. Because most students struggled to understand the vector's components and the vector itself, according to earlier studies, most students did not master the vector. Students sometimes confuse the magnitude of the vector and the magnitude of each component.

Next, a hint will be given on how to move on to the following checkpoint. This hint will make the game more enjoyable and may help you learn more in general. Students will be taken to the vector question by the correct response.

Since the goal of this application is for students to do reinforcement rather than assessment, there is no punishment and no time limit so students can take their time to solve the questions. If the students' answer is incorrect, solutions with explanations are given to them so they may understand the material better.

They must compute the vector between their starting point and their destination at the latest checkpoint. The right response will lead to a treasure, one of which is a key to the next level or path. Besides, the app has a monitoring function that will keep users on track in order to strengthen the concepts.

COMMERCIAL POTENTIAL

Understanding vectors is crucial if you want to excel in physics since the concept is going to be utilized in practically all other physics topics. But occasionally, especially with online schools, classes can be so dull that students find it difficult to concentrate. Students will eventually develop a dislike for physics as a result of this and be unable to comprehend other physics topics. Therefore, the issue can be gradually solved with this invention. This application allows students to test their knowledge of the topic vector. To make learning more enjoyable, teachers can also present this application to their students in class.

The only thing left to do now is to publish this idea as an application on Google Play or the Apple Store since we already have a prototype. Every mobile device may get it, and you can also look for it online. With the help of this innovation, students will be able to practice physics vector problems whenever and wherever they like. Students will experience less stress while learning as a result. We anticipate that this application will be warmly appreciated by the secondary school students, foundation and matriculation students, first-year bachelor's in physics students, teachers, lecturers, and even preschoolers who make up our target audiences.

As a registration fee, this application will cost $25 or RM105 once it is published on Google Play Store, and it will cost $99 or RM416 annually to publish on Apple Store [1]. Our primary motivation for creating this application, which is available for free download on the Google Play Store, was to aid students who were having difficulty understanding the topic vector.

This idea has been used in various contests and has received a silver award from IIDEX 2021 and a gold award from AICD 2021. Additionally, the MyIPO IP Online System has recognised it in case LY2021E03379, type Copyright Voluntary Notification.

CONCLUSION

In conclusion, students can somewhat conquer their topic vector challenges with this Vector Hunt Game while experiencing less stress. This is due to the fact that kids can study and apply the material while engaging in a virtual treasure hunting-like activity. In order to improve gameplay and include features like a timer, more tips, and flashcards for taking notes, this programme is anticipated to be built utilizing a coding system in the future. Furthermore, this application can be improved by including additional physics-related issues like torque, electric

charges, and optics utilizing a different methodology. We anticipate that this innovation will make student life less stressful and more enjoyable to look back on.

ACKNOWLEDGEMENT

We are unable to contain our thanks for everyone who helped us turn our thoughts for this project, which is far more complex than it appears at first glance. We would like to show our sincere gratitude to Madam Asyikin Ahmad Nazri, our supervisor, for giving us the excellent opportunity to work on the Vector Hunt Game in Creations de UiTM 2023. As a result, we were able to conduct extensive study and learn a tonne of brand-new information for this project. She has earned our thanks. We also want to express our gratitude to our family and friends because, without their help and support, no endeavor, no matter how big or small, can be completed successfully. They gave us many ideas on how to make this project stand out.

REFERENCES

[1] Granados, W. by J. (2021, October 31). How to publish an app on Google Play Store and app store (apple). GoodBarber. Retrieved March 14, 2022, from https://www.goodbarber.com/blog/how-to-publish-your-app-on-google-play-and-the-ppstore-a107/

[2] Zavala, G., & Barniol, P. (2010, October). Students' understanding of the concepts of vector components and vector products. In AIP Conference Proceedings (Vol. 1289, No. 1, pp.341-344). American Institute of Physics.

[3] Bitesize. (2022). Vectors - Vectors - Edexcel - GCSE Maths Revision - Edexcel. BBC Bitesize.https://www.bbc.co.uk/bitesize/guides/z8myrwx/revision/1#:%7E:text=A%20vector%20describes%20a%20movement,direction%20and%20magnitude%20(size).

[4] Vanessa, D. (2015). ESSAY ON INNOVATION. ResearchGate. https://www.researchgate.net/publication/277713474_Essays_on_Innovation

[5] WowEssays. (2020, February, 23) Free Essay About Innovation. Retrieved March 18, 2022, from https://www.wowessays.com/free-samples/free-essay-about-innovation/

[6] (2021, December 3). Know About the Online Learning Challenges & Solutions. Embibe Exams. https://www.embibe.com/exams/online-learning-challenges-and-solutions/

[7] Ornek, et. al. (2008, January) What Makes Physics Difficult? Retrieved March 18, 2022 from https://eric.ed.gov/?id=EJ894842

Little Helper

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ABSTRACT

Little helper is an application, the function of this application is to help all Muslim around the world. This is because as time goes by the percentage of Muslim all over the world increases but the problem that the Muslim society faces is the lack of faith among the followers itself. To resolve this problem that we will be facing, Little Helper is created. In this application users can access the information needed to improve their faith, because the information that will be provided are, location of halal foods, the direction of qibla, everything about the Syariah laws, the call of prayer and more. With this information taken from a verified institution such as Majlis Agama Islam Malaysia the Syariah laws will be accurate. This will surely provide the foundation to build a united Muslim society and have a solid faith in Allah SWT.

Keywords: Direction of qibla; halal food; prayer

INTRODUCTION

As smartphones have evolved into a crucial tool for productivity, entertainment, and communication, mobile apps have become a vital part of our everyday life. Software programmes known as mobile apps are created specifically to run on portable electronics like smartphones and tablets. They were designed with a specific function in mind, whether it be handling personal data, playing a game, or offering a service [1].

Islamic smartphone apps are software programmes created especially for the Muslim community, giving them instant access to the principles, rituals, and resources of Islam. Islamic mobile apps have developed into a crucial tool for Muslims worldwide, enabling people to stay connected to their communities and faith as a result of the rise in smartphone use [2-3].

Little Helper was developed to assist new brothers and sisters. A smartphone software called Little Helper can offer crucial information for Muslim life. They include the hours of prayers, locations that serve halal food, and the direction of the Qibla. Additionally, it can introduce Islam to the general public. Additionally, Muslim brothers and sisters can seek assistance from Ustaz and Ustazah who are willing to help them understand the law by using this programme. To that extent, Little Helper can raise the bar for Islamic education and make it more adaptable.

INNOVATION DEVELOPMENT

Little Helper was primarily created to assist Muslim men and women, particularly those who had recently converted to Islam, or muallaf. As we look at the world today, we see that more and more heretical teachings being produced to perplex Muslims and lead them astray from their religion. Because of our worry over this issue, Little Helper, an application for Muslims, was conceptualised. When we prepare to implement this application, we have a number of goals in mind. First, directing converts toward authentic Islam. Because they were initially ignorant of the genuine religion of Islam, several heretical beliefs that have thrived in our nation have the potential to mislead converts.

Then, the process of acquiring a basic understanding of Islam. A person must be aware of and uphold all his stated duties if he wants to be considered a sincere Muslim. Lastly, making sure the user is aware of the azan time The foundation of religion is prayer. Therefore, praying is required of all Muslims, regardless of how long they have practised Islam or how recently they converted. The sound of the azan signals that it is time for prayer. The Selangor Islamic Religious Department's (JAIS) website provides azan time references.

COMMERCIAL POTENTIAL

We will offer a premium account option in our application. A premium user will be able to utilise the application uninterrupted by advertisements. Do not worry; only the chosen company will sift the adverts. This is done in order to pay the Ustaz and Ustazah their wages while they are on duty answering inquiries about Islam.

Muslim men and women are our target market. We still need to learn about our own faith in order to adopt Islam as a lifestyle because we are imperfect humans. The product's advantages include giving people convenience. Considering that we may utilise the app on our smartphones. The application will thereafter continue to be used by users during daily activities like prayer and chanting. However, Little Helper can make it simple for users to get in touch with Ustaz and Ustazah via messages if they have any questions. Users need not be concerned about the accuracy of the information because it comes from a reputable source like Majlis Agama Islam Selangor (MAIS).

Our ability to identify local businesses that are halal is what distinguishes us from other applications. Additionally, if there isn't a mosque or surau nearby, it can tell the direction to face in order to pray. Finally, it can discover nearby surau or mosques. Along with reminding users of the direction of the qibla, it also displays the appropriate prayer hour for their location. This application also includes Islamic teachings from various sects. We also provide a section on Iqra that explains how to read it and serves as a warm-up for reading the revered Al-Quran, as well as a few minigames for readers to review their knowledge of Islam.



Figure 1: Little Helper Application Interface

CONCLUSION

The most recent technology was used to create this programme, which is a tool for enhancing Muslim faith. This programme is easily available to people of all ages and can assist Muslims, particularly converts, in learning more about Islam and carrying out their obligations as Muslims in accordance with the information at their fingertips.

ACKNOWLEDGEMENT

We must express our gratitude to Dr. Fadiatul Hasinah Muhammad and Ustaz Muhamad Zariff Ilias our mentor, for their guidance in completing this application prototype. We also sincerely appreciate the help from friends and family in getting everything done. We appreciate the support of the UiTM Dengkil Campus Center of Foundation Studies in sponsoring this CDU 2023 participant.

REFERENCES

[1] Islam, M. R, Islam., M. R & Mazunder, T.A. (2010). Mobile application and its global impact. International Jourmnal of Engineering & Technology, 10, 104-111.
[2] Rasool, A., Shah, F.A., & Islam, J. U. (2020). Customer engagement in the digital age: a review and research agenda. Current opinion in Psychology, 36, 96-100.
[3] Bibi, H., Munaf, R. M., Bawany, N. Z, Shamim, A., & Saleem, Z. (2020). Usability evaluation of Islamic learning mobile applications. Journal of Islamic Science and Technology, 6, 1-12.

Automated Dish Sorter Using Arduino

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ABSTRACT

Commonly, the food court has a few stalls. Each stall uses a different set of colors for its plates. The customer usually places the plate in one place such as the basin provided. All the plates in the basin are unsorted. Sorting a pile of plates manually according to the stall's plate takes a long time for the worker. To overcome this problem, this study proposes an automated dish sorter using a microcontroller by applying the fuzzy logic method. An Arduino Uno microcontroller was used to control the process and a TCS3200 color sensor was used to detect the color of the plates. The fuzzy logic helps in the sorting process of the plate for each stall automatically. The result of this prototype is being able to sort the plates according to their color correctly into the respective bins.

Keywords: Arduino Uno; Fuzzy Logic; TCS3200 Color Sensor

INTRODUCTION

In today's fast-paced world, automation has become increasingly popular in various industries, including the food industry. Automated dish sorting systems are one such example that can significantly improve the efficiency and accuracy of commercial kitchens. By using sensors and controllers, these systems can automatically sort dishes and utensils, freeing up staff to focus on other tasks [1].

An automated dish sorting system using Arduino is an exciting development in this area. Arduino is a popular microcontroller platform that is widely used in various industries due to its affordability and flexibility [4]. With Arduino, an automated dish sorting system can be developed and implemented quickly and easily, providing businesses with an affordable solution to their dish sorting needs.

The system can sort dishes based on a main parameter which is the color sensor detects the various color of all the dishes according to the stallers preference [5]. By automating the dish sorting process, businesses can reduce labor costs, improve productivity, and minimize the risk of errors and cross-contamination. Additionally, the system can help to improve customer service by reducing wait times and enhancing order accuracy.

INNOVATION DEVELOPMENT

The automated dish sorter using Arduino is a fascinating innovation that has made the work of stall owners and restaurant staff easier. However, there is still room for development and improvement to make the process even more efficient. One potential area for future development is the integration of sensors that can detect the size of the plates and sort them accordingly. This would save time and improve accuracy, as the sorter would not have to rely

solely on color detection.

Another area for innovation is the use of artificial intelligence (AI) to improve the accuracy and speed of the sorting process. With AI, the sorter could learn from its previous sorting patterns and adjust accordingly to sort the dishes more efficiently. This would save time and reduce errors in the sorting process.

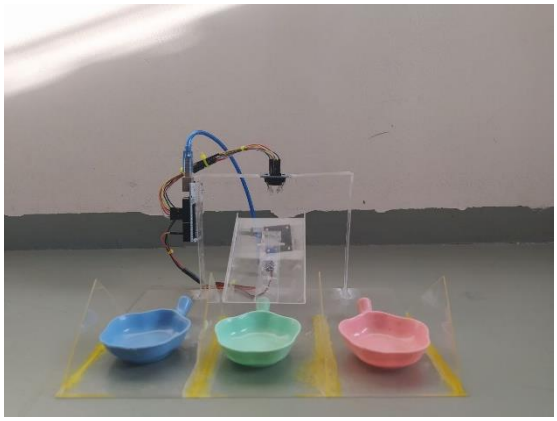


Figure 1: Front view

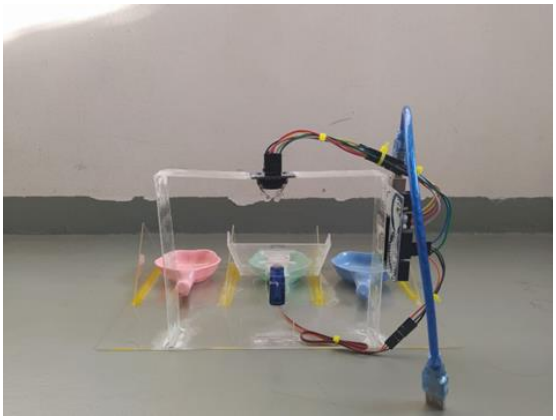


Figure 2: Back view

METHODOLOGY

The prototype was developed using Arduino Uno microcontroller and TCS3200 color sensor to detect the color of the plates. The color sensor was used to detect 3 different colors of the plates and fuzzy logic was implemented for the process of sorting the plates according to the color [7]. Servo motor was used to move the plates into 3 different bins according to their colors.

Block Diagram

Figure 3 shows the block diagram for the prototype dish sorter and several components contain in the automated dish sorter are light-emitting diode (LED), TCS3200 color sensor, Arduino Uno microcontroller and servo motor [3].

The power supply is part of the component used to supply electric current to the circuit. It helps to activate the circuit and electronic devices. LED is a semiconductor device that emits light. It is used in many applications. Sometimes it is used as an indicator to show whether the state is ON or OFF. In this prototype, LED was used to enhance the color of the plates more precisely.

TCS3200 color sensor has an array of photodiode. It is designed to detect light intensity. The color was sense and used as input to the Arduino Uno microcontroller.

The sorting process was controlled by the microcontroller which is Arduino Uno. It receives input from the color sensor then processes it by identifying the color and sort it based on the logic defined and provide the output.

The Servo motor helps to direct the plate based on the output received from the microcontroller to the respective bin according to the color.

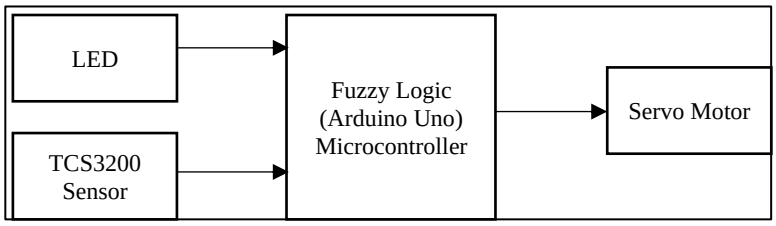


Figure 3: Schematic diagram of automated dish sorter

Flowchart

In Figure 4 shows the flowchart of the sorting process. The plate placed on the Perspex and the LED help to enhance the color of the plates. This will help the TCS3200 color sensor to detect the color correctly. TCS3200 color sensor detect the color on the plate as an input to the Arduino Uno microcontroller. Then, the microcontroller process the color and identify the Perspex turn to a certain degree of angle and place the plate according to the bins.

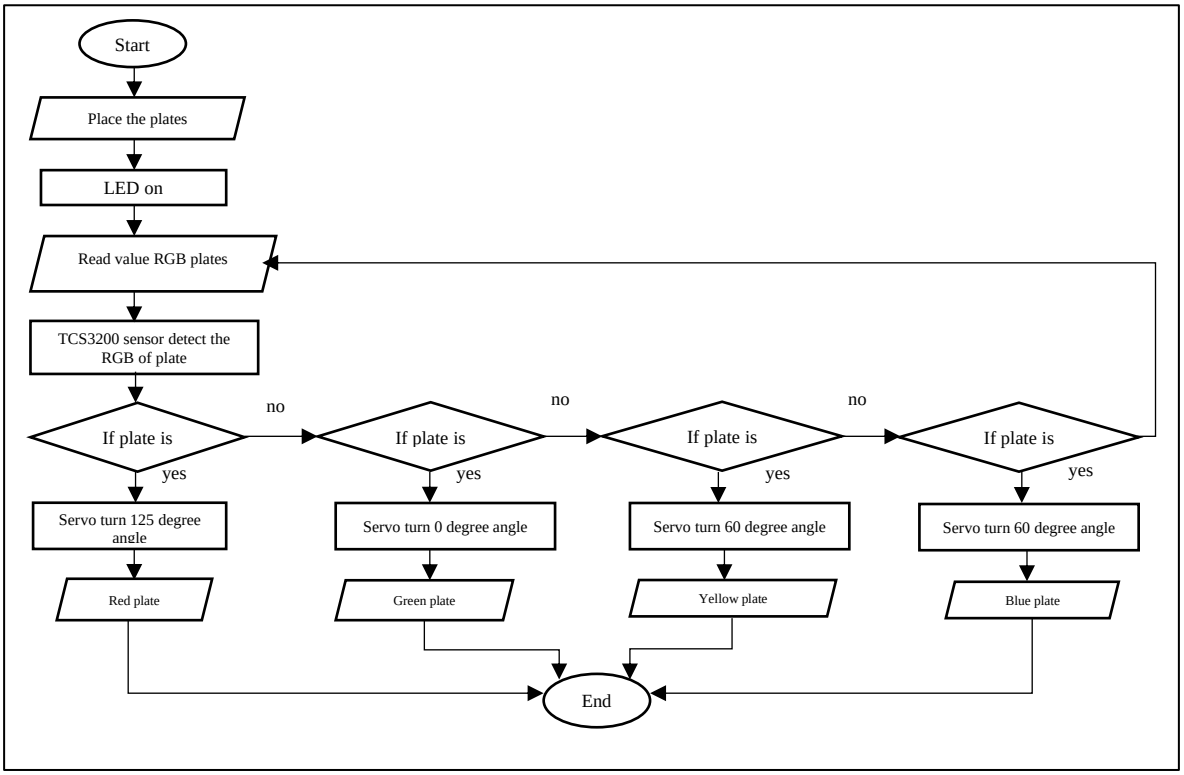


Figure 4: Flowchart sorting process

Implementation Fuzzy Logic for Sorting Process

The prototype is designed by adapting fuzzy logic for sorting process. The color of the plate is an input for the microcontroller and the output is the movement of the vane attached with servo motor. The fuzzy logic is used to determine the vane position and turn into a certain degree of angle and place the plate according to the correct bin based on the condition of the color plates.

COMMERCIAL POTENTIAL

Automated dish sorting systems have great commercial potential in the food industry, particularly in busy kitchens and food stalls where time and efficiency are crucial. An automated dish sorter using Arduino is an excellent example of how technology can be utilized to streamline kitchen operations and improve customer service [2].

The use of Arduino in automated dish sorting systems provides an affordable and user-friendly solution for businesses. The platform is widely available and has a large community of developers who can provide support and guidance. Additionally, the open-source nature of Arduino allows for customization and flexibility, making it easier for businesses to adapt to changing needs.

Automated dish sorting systems can greatly improve efficiency in the kitchen by reducing the need for manual labor. The system can quickly and accurately sort dishes based on various parameters such as size, shape, weight, or color. This frees up staff to focus on other tasks, such as food preparation and customer service. Furthermore, automated dish sorting can help to reduce errors and minimize the risk of cross-contamination.

The implementation of automated dish sorting can also lead to cost savings for businesses. By reducing the need for manual labor, businesses can reduce their labor costs and improve productivity [6]. The system can also help to minimize dish breakage, reducing the need for replacements and repairs.

In conclusion, the commercial potential of an automated dish sorting system using Arduino is significant. The technology can help businesses to improve efficiency, reduce costs, and enhance customer service [8]. With its affordability, user-friendliness, and flexibility, Arduino provides an excellent platform for developing and implementing automated dish sorting systems.

COST

ITEM	UNIT	PRICE(RM)
ARDUINO UNO BOARD	1	42.90
MICRO SERVO MOTOR	1	6.90
COLOR SENSOR	1	21.90
JUMPER WIRE (30cm)	25	0.25
BATTERY 9V	1	6.70
ACRYLIC SHEET(A4)	3	5.70
ACRYLIC GLUE (30ml)	1	10.00
ACRYLIC CUTTER	1	8.10
TOTAL COST(RM)		104.7

PROFIT MARGIN

PROFIT= PRICE - COST
= RM150 – RM104.7
= RM49.30

PROFIT MARGIN = PROFIT/PRICE*100
= RM49.30/RM150*100
= 32.87%

CONCLUSION

In conclusion, the automated dish sorter using Arduino is an innovative solution that addresses the challenges of dish sorting in food stalls and homes. The device offers convenience and efficiency, enabling stall owners to collect and sort their plates based on color preferences effortlessly.

Moving forward, there are several future developments that could enhance the device's functionality. For instance, incorporating machine learning algorithms could improve the device's ability to sort plates accurately, especially when the colors are similar. Additionally, incorporating a sensor to detect plate size could make the device versatile and applicable in different settings.

In terms of recommendation, we suggest that food stall owners and homeowners consider adopting the automated dish sorter to improve their efficiency and organization. The device's affordability and simplicity make it an attractive solution for those seeking to streamline their plate sorting process.

In summary, the automated dish sorter using Arduino is a practical and innovative solution to the challenges of plate sorting. With its ease of use and affordability, it has the potential to revolutionize the way we sort dishes in food stalls and homes. We look forward to seeing the device's continued development and adoption in the future.

ACKNOWLEDGEMENT

We would like to express our gratitude to Madam Nurhilyana binti Anuar, our CSC099 lecturer, for her vital role in coordinating the project. She provided us with detailed instructions and guidelines, which were instrumental in completing the project. Her insightful comments and recommendations also helped us to finish the project.

We are grateful for the opportunity to participate in the 'CREATIONS de UiTM: INTERNATIONAL MEGA INNOVATION CARNIVAL 2023' event, organized by the Centre for Foundation Studies at UiTM Cawangan Selangor Kampus Dengkil. This event allowed us to showcase our creativity and talents to the world, which not only helped us develop teamwork skills but also encouraged us to work independently.

Finally, we would like to acknowledge the exceptional work done by our team members. With their active participation and efficient delegation, we were able to complete the project before the deadline. The group discussions and meetings were carried out without any hindrances, making it a smooth process.

REFERENCES

[1] Kim, J., Lee, M., Kim, K., & Lee, S. (2021). Development of an automated dish sorting system using Arduino for restaurant operations. Journal of Foodservice Business Research, 24(3), 233-245. https://doi.org/10.1080/15378020.2021.1906392
[2] International Journal of Engineering Research & Technology (IJERT). (2020). Automated Dish Sorter Using Arduino. (Vol. 9, Issue 6, pp. 865-870).
[3] Arduino. (2021). Arduino - Home. https://www.arduino.cc/

[4] Khan, I. A., & Gondal, I. (2019). A review on automated sorting techniques for food industry. Journal of Food Process Engineering, 42(3), e13006. https://doi.org/10.1111/jfpe.13006

[5] Gupta, A., Gupta, A., & Gupta, R. (2021). Function of color sensors in a dish sorting system. International Journal of Engineering and Advanced Technology, 10(2), 476-481. https://doi.org/10.35940/ijeat.B2877.129102

[6] Saeed, I., Anwar, S., Khan, I. A., Kamal, S., & Zaman, W. (2019). The impact of automation on food industry: A review. Frontiers in nutrition, 6, 7. https://doi.org/10.3389/fnut.2019.00007

[7] Gao, Y., Li, D., & Xia, J. (2017). Application of fuzzy logic control in food processing. In 2017 2nd International Conference on Mechanical, Control and Computer Engineering (ICMCCE) (pp. 437-440). IEEE. doi: 10.1109/ICMCCE.2017.207

[8] Vivek, P. (2017). Real time implementation of automated food sorting system using arduino. International Journal of Engineering Research & Technology (IJERT), 6(04), 290-293. https://www.ijert.org/research/real-time-implementation-of-automated-food-sorting-system-using-arduino-IJERTV6IS040429.pdf

EPROS

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ABSTRACT

Since the beginning, speaking the English language has been a challenge for most of the Malaysian students. Lack of confidence and afraid of being judged, are among the reasons behind the insecurities of the students to use the English language in their daily life. As a result, this predicament has hindered their English language learning as they are too scared to ask questions when they do not understand certain topics in class. Therefore, the proper initiative must be carried out to help Malaysian students to improve their speaking skills either in ESL classrooms or outside of the classroom. This paper aims to shed light on one of the ways to enhance students' speaking skills, which is through a program named EPROS. EPROS is a conference-like program that consists of 7 booths that will cover 7 components which are divided into 2 aspects. The first aspect is the internal factors of an individual which are inhibition, nothing to say, low participation, and mother tongue use (Ur, 1996). The second aspect is the components of English speaking skills which are vocabulary, pronunciation, and grammar (Brown, 2004; Fitriani, 2015; Syakur, 2007). This program will be involving the students of Pusat Asasi, UiTM Kampus Dengkil, both as the mediators and participants, and it will be open to the public who are interested in improving their English speaking skills. The objective of this program is built under the foundation of a need analysis where the majority of the respondents (90 out of 120 respondents) chose speaking skills as the most challenging skill in learning the English language. Hence, it is hoped that this program can be one of the significant factors in enhancing and improving Malaysian students' English speaking skills.

Keywords: EPROS; English speaking skills; ESL learners

INTRODUCTION

EPROS is a program that adapts a conference-like event where we will have 7 booths that will cover different components of English-Speaking Skills (Brown, 2004; Fitriani, 2015; Syakur, 2007). In each of the booths, participants will be exposed to English speaking skills in a fun way (putting aside the traditional method of learning) and they also get to play games. Applying the notion put forward by Lubis (2019), giving rewards can increase students' motivation and enhance students' enthusiasm in learning English. Hence, when the participants have done all the games, they will be given rewards that not only increase their motivation but ensure their participation in all of the booths. Thus, it is hoped this program can shed light on the teaching of English-speaking skills and provide a medium for students in Malaysia to speak the English language comfortably.

INNOVATION DEVELOPMENT

EPROS is an exhibition that was developed by DAZEQ Innovators. Our product, EPROS,

stands for English Proficiency of Speaking in which this product's sole function is to improve English Speaking Skills. Before this product is made, a need analysis survey was done via Google Forms to identify which part of the English Proficiency Skills students are struggling with. Hence, based on that need analysis survey, most of the respondents claimed that they are struggling with speaking. As a result, EPROS is invented as a means to aid those who are struggling to speak the English language. In this program, there will be 7 booths that will cover all the components of English-speaking skills, which are Inhibition, Nothing to Say, Low Participation, Mother Tongue Use, Vocabulary, Pronunciation, and Grammar.

The flow of the event is that the participants will have to go through the first 4 booths starting on the bottom left first. This is where they can learn how to gain confidence in speaking English. This is then followed by the last 3 remaining booths where they learn how to use the proper grammar, vocabulary, and pronunciation when speaking in English. Once all the booths are covered, participants can claim their reward from the Reward Booth for completing all the 7 booths. It will be the highlight of the EPROS exhibition to boost the participants' motivation through the rewards. This booth will be located at the center of the exhibition next to the organizer's booth. Through EPROS, participants hoped to gain fluency in speaking the English language and EPROS acts as a medium to enhance the participants' English Proficiency skills.



Figure 1: Sample of EPROS by DAZEQ Innovators

COMMERCIAL POTENTIAL

EPROS is a product that is based on the social entrepreneur business model. EPROS' mission is to provide affordable and accessible English language learning opportunities to students, particularly those from underserved communities or non-native English speakers. The goal is

to empower them with the skills needed for better educational and career prospects. Next, by creating this product, we can generate revenue through various channels, such as offering paid subscriptions to individuals, partnering with educational institutions or language centers, or licensing the program to schools or organizations. Additionally, it could explore grants or sponsorships to provide free or discounted access to students who cannot afford the program. Engaging with students, parents, educators, and community organizations is crucial as collaborating with schools, universities, and NGOs can help reach the target audience effectively. Feedback from stakeholders should be incorporated to continuously improve the program and adapt to their needs. Last but not least, EPROS is able to incorporate innovative and effective teaching methodologies, and interactive learning resources, and potentially leverage technology to enhance the learning experience. This could include features like speech recognition, personalized assessments, and gamified elements to make learning easier and more fun rather than the traditional way of learning.

CONCLUSION

Based on our research and the feedback that we received from experts and the public, we can conclude that our product, EPROS, is able to fulfill its main objective which is to help and encourage the student to speak English comfortably and confidently in a fun and effective way. Furthermore, by participating in this program, the students not only are able to gain knowledge for themselves, but they are also able to help others improve their speaking skills. Therefore, we hope we are able to shed light on the new teaching and learning process in order to effectively and efficiently improve English Speaking Skills.

ACKNOWLEDGEMENT

We would like to extend our utmost gratitude to the organizers of Creations de UiTM (CDU2023) for giving us support and for providing us the medium for us to embark on creating a product that is not only hoped to enhance Malaysian students' English proficiency skills but to increase the visibility of Pusat Asasi. Last but not least, we are forever grateful to have our positive and supportive families with us throughout the research process. Thank you.

REFERENCES

[1] Chou, D. C. (2018). Applying design thinking method to social entrepreneurship project. Computer Standards & Interfaces, 55, 73-79. https://doi.org/10.1016/j.csi.2017.05.001
[2] Seelos, C., & Mair, J. (2018). Social entrepreneurship: Creating new business models to serve the poor. Business Horizons, 48(3), 241-246. https://doi.org/10.1016/j.bushor.2004.11.006.
[3] Lubis, W. M. (2020). Reward and punishment in English foreign language classroom. Journal of Education, Linguistics, Literature and Language Teaching, 2(1).
[4] Nggeabak, I. U. (2021). English education study program language and art education department teacher training and education Faculty Tadulako University 2021. Investigating the Difficulties in Speaking English Encountered by The Eighth-Grade Students of SMPN 1 Balaesang Tanjung.
[5] Saebi, T., Foss, N. J., & Linder, S. (2019). Social entrepreneurship research: Past achievements and future promises. Journal of Management, 45(1), 70-95.

MyTabung: An Automatic Counting Machine for Money

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ABSTRACT

Saving money is a wise thing to do in life. Children have been taught to save money and give 'sadaqah' till it comes naturally to them from an early age. Normally people will keep their cash in a variety of sized and shaped money boxes. The market has a wide variety of money boxes, some people even make their own money box from recycled materials and as it fills up, the money inside must be counted before depositing in the bank. Most people have struggled with money counting, especially when handling big sums of cash. Currently man must count the money manually and it is time-consuming, tedious and higher tendency of error due to many reasons. Money counting machines do exist, but exclusively used in banks, and only count the number of notes, not the total amount of money. To address this issue, alternative money-counting methods can appear to be crucial because accurate money-counting is able to provide quantitative output and time saving. This will be the main purpose of this innovation. This innovation consists of Arduino Uno and various components such as colour sensor, servo motors, RFID and LCD display. A colour sensor is used to develop the automated gadget known as MyTabung, which counts the total amount after determining the colour of the notes and displays it on the LCD screen. MyTabung uses RFID technology to provide high levels of security, and only authorised users are allowed to access. The management of the mosque, individuals, and those in charged for financial management are believed to profit from MyTabung's distinctive qualities. MyTabung able to save time and money while increasing accuracy and security. It provides faster processing time, higher accuracy, reduced labour costs and potential theft. Therefore, allowing more efficient and precise information acquisition.

Keywords: Automated device; Arduino; time saving; accuracy; less costs

INTRODUCTION

Most people have struggled with money counting, especially when handling big sums of cash. The Federal Bill Counter Company of Washington, D.C. created the first automatic bill counters or known as money counters that were released in the 1920s in the United States. The Federal Reserve Bank's tellers will work more efficiently and make fewer mistakes thanks to these devices [1]. However, it was not really a counter machine as the machine's counter would halt when the number of notes in any container reached 100. The teller then used a wooden block to insert to separate the 100-bundle bundles and when the count hit 100, that device began to signal rather than operate as a counter. Despite this restriction, it was very helpful to bankers in keeping up with the expanding amounts of money in circulation at the time. The real currency-counting device was created only in the late 1950s by a small-time banker in China named Zhi Tian Sie, who created it to win a competition [2]. The technology used by contemporary counting machines was created by Tokyo Calculating Machine Works of Shinagawa, Tokyo,

and unveiled in 1962. It immediately became the market leader in terms of accelerated speed and accuracy [3]. Most banks today utilise some kind of machine to expedite counting cash and speed up the process of spotting counterfeits, making banks the most likely site to witness a currency-counting machine. There are other variations of counting machine, such as banknote only, coin counting, coin sorting, and counting both banknotes and coins and to detect fake notes [6]. Optical sensors, image processing and computer vision are technologies being utilized in the modern currency counters [4,5].

Currently man must count the money manually and it is time-consuming, tedious and higher tendency of error due to many reasons. There are machines that count money, but they are only found in banks and only count the quantity of notes, not the total amount. Since accurate money-counting can result in quantitative output and time savings, alternative money-counting techniques may seem essential to solving this problem. This is going to be the main goal of this innovation. Besides, the goals of the innovation are to provide a secure way in manage, count and save money and to monitor the saving towards specific financial goal. As for this innovation, it is aiming the small to medium scale usage of counting machine. Individual, religious organization or mosque management, charitable organization and medium business are the target users as this innovation is more to saving or collecting money with automated counter purposes. Normal money box only serves as a place to collect money. MyTabung offer a better money box with unique features; only authorized person can access the money box via RFID technology which give better security and display amount of money inside the box via LCD display.

INNOVATION DEVELOPMENT

The innovation consists of Arduino UNO, servo motor, LCD display, lock, RFID reader, and colour sensor. The colour sensor in MyTabung is a sophisticated piece of technology in detecting the colour of notes that being deposited in the box. The colour sensor comes with algorithms that are capable of accurately identifying the colour and measuring the values. In other words, each time a note being deposited in the box, the Arduino UNO, which act as the brain of the innovation will count the money based on the colour detection. The amount will be displayed via LCD module which located inside the box.

Only authorised individuals can use RFID technology to open the box and gain access to MyTabung. These features give MyTabung a secure and time saving output.

COMMERCIAL POTENTIAL

The innovation is designed to save or gather money with automated counter purposes that offer high levels of security, therefore its target market is people who have encouraged their children to save money. Even though there are many colour and shape options for money boxes on the market, they may still be uninspired and uninspired enough. Religious organization or mosque management is one of the potential users. To avoid theft, ordinary "sadaqah" money boxes that are placed in mosques typically have a padlock as a locking mechanism and compel management to tally the amount of cash in the box. This will make the process of totalling the money less safe and subject to human mistake. Small- to medium-sized businesses and non-profit organisations are likewise susceptible to the same predicament. As a result, they will also be the target users.

The conventional money counting machine already in use is thought to be more suited for large scale business use and not the intended users of the innovation. Additionally, the cost for personal use is rather high if using conventional money counting machine. People can now have the same technology utilised in large scale businesses at a low cost because to this invention. The expected profit margin will be 35% at most for this innovation.

Due to uniqueness of this innovation, MyTabung is now in the middle of applying for Copyright form the authority. Once it is awarded, the innovation can be commercialized in peacefully.



Figure 1: Front view of MyTabung

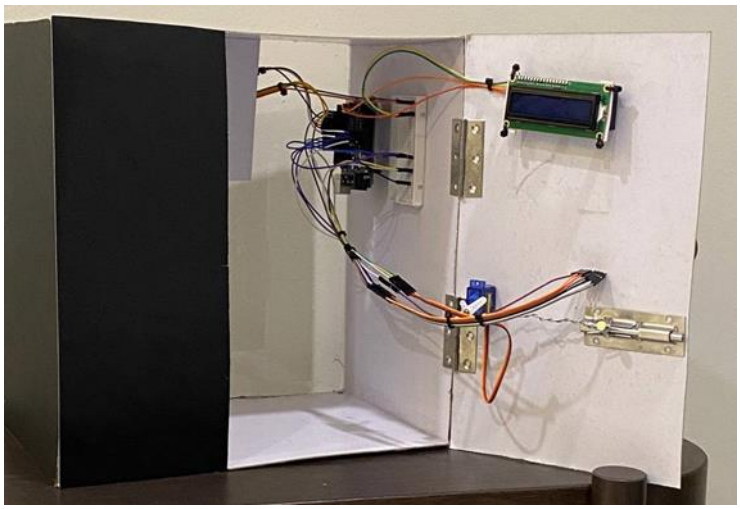


Figure 2: Inside of MyTabung

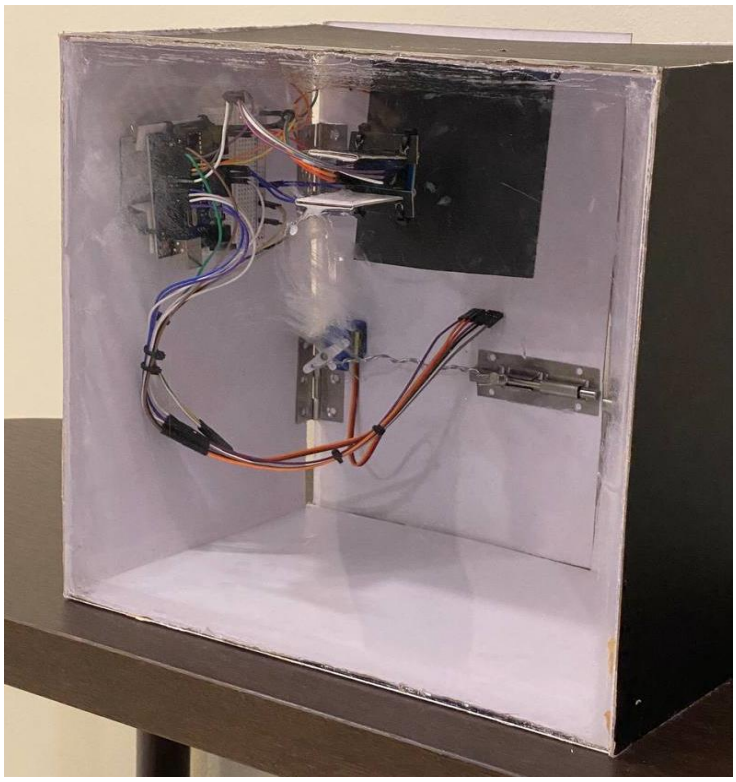


Figure 3: Back view of MyTabung in lock position

CONCLUSION

MyTabung is a technological advancement that addresses the problem of money counting while enhancing security. It is firmly believed that by using MyTabung, parents may motivate their children to save money in an enjoyable way, and individuals who oversee managing money in an organisation can work stress-free. MyTabung is a financial management solution that simplifies tracking savings towards specific goals. It provides motivation and accountability for individuals and businesses, making it easy to manage, count and save money securely. In addition, it promotes 'sadaqah' habits and provides a fun way to set charity goals and track progress.

Future improvements will include wireless connectivity, which enables users to connect to the internet or other devices wirelessly, facilitating data transfer and enabling remote progress monitoring. It can use IoT technologies to achieve this. This indicates that a user's smartphone or other internet-capable device can obtain real-time updates on their savings.

One of the upgrading features for this innovation may be multi-user support. This tool adds still another degree of flexibility and convenience, making it simple for numerous people to work towards common financial goals. It also encourages teamwork and collaboration, making it ideal for families and organisations with similar financial aspirations.

REFERENCES

[1] Wells, D. R. (2004). *The Federal Reserve System: A History (Chapter 6).* Digital Vision.
[2] Staughton. J. 2018. *How do currency counting machines work?* Retrieved May 6, 2023, from https://www.scienceabc.com.

[3] Tavlas, G. S., & Ozeki, Y. (1992). *The Internationalization of Currencies: An Appraisal of the Japanese Yen.*

[4] Ribao Technology. (2023, March 26). *The history of the first money counter.* Retrieved May 6, 2023, from https://www.ribaostore.com/blogs/news/the-history-of-the-first-money-counter.

[5] Temiloluwa, A. A. (2019*). Design and Construction of a Currency Counting Machine with Fake Note Detection.* Retrieved May 6, 2023, from http://178.79.165.82/handle/123456789/1967.

[6] Anupa, K., Shraddha, S. & Prachi, B. (2019). *Coin counting and sorting machine.* 2019 9th International Conference on Emerging Trends in Engineering and Technology – Signal and Information Processing (ICETET-SIP-19). doi: 10.1109/ICETET-SIP-1946815.2019.9092251.

Designated Parking for OKU with RFID Access

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ABSTRACT

Most structures, public spaces, and even public transportation in Malaysia have offered disabled-friendly infrastructure to those in need as awareness of the need of services for individuals with disabilities grows. Even an exclusive area for parking cars has been created. To make everything easier for those with impairments, this space is typically placed close to the entrance. However, not everyone is aware of this group of people with disabilities, even being selfish. Even though it is obvious that this parking space is designated for the disabled, they unilaterally leave their cars parked there. The reason for this is that the entrance is not far from this area. They blatantly park their cars there even they don't have any disabled person decals. For individuals who are in extreme need, this attitude of selfishness is especially challenging. To address this issue, something needs to be done so that people not misused and being selfish. Designated Parking for OKU with RFID Access is an innovative solution that addresses the problem of unauthorized usage of disabled parking spaces. The use of RFID by OKU to obtain parking space authorization was highlighted by this invention. Unauthorised vehicles may have to pay for the compound before they are allowed to leave if the space is filled with them. These were the key goals in mind when this innovation was created. This innovation utilizes ultrasonic sensors to detect incoming vehicles and RFID readers to determine if the vehicles are authorized to park in the designated area. Unauthorised vehicles are prevented from leaving the parking lot by the system's boom gate, which is operated by a servo motor, allowing management to respond to the offender. Conversely, authorized users can enter and exit the parking lot without any issue. The uniqueness of Designated Parking for OKU with RFID Access gives it a significant advantage in the market. This innovation could potentially address the issue of unauthorized vehicles occupying designated spaces, leading to a decrease in conflicts between users of parking lots. Overall, this innovation is a revolutionary innovation that offers a reliable and efficient way of controlling access to disabled parking spaces.

Keywords: OKU; authorized person; RFID; parking space; disable

INTRODUCTION

As the necessity for services for people with disabilities becomes more widely acknowledged, most buildings, public areas, and even public transportation in Malaysia have provided disabled-friendly infrastructure to those in need. Even a private parking lot has been established. This area is often located near the entrance to make things simpler for those with disabilities.

As stated in [1], one of the most hotly contested topics in today's local society is the violation of disabled people's rights. The community is less conscious of the abuse that takes place around them today. In the context of disability parking places, it has become normal to

obstruct those designated spaces without being held accountable. The fact that non-disabled people are now parking in disability parking places makes this situation a complete mess.

According to a study by The Star Online, the penalty for wrongful usage of parking bays for the disabled (OKU) is steep, and yet the misdemeanour is rampant in Petaling Jaya [2]. The article reported that in the past 14 months, the total number of compounds issued by the Petaling Jaya Municipal Council (MBPJ) was 211, but only 69 have been settled. It is also reported that, due to the widespread sale of fake stickers in hardware shops and bookshops, there seems to be some confusion about OKU stickers which are intended for identifying a car belonging to individuals with disabilities.

This problem is not unique to Malaysia and is a global issue, with disabled parking spaces often being misused by able-bodied drivers, causing frustration and inconvenience for those with disabilities. The objective of this innovation, Designated Parking for OKU with RFID Access is to provide a practical solution to this problem by using advanced technology to control access to these parking spots, ensuring that only authorized vehicles are allowed to park in them.

The motivation behind this innovation is to create a more accessible and equitable society for individuals with disabilities, who often face significant challenges in their daily lives. By providing a solution to the problem of unauthorized parking in disabled parking spots, it is expected to make a positive impact on the lives of these individuals and promote greater awareness and understanding of their needs.

INNOVATION DEVELOPMENT

Designated Parking for OKU with RFID Access is a solution for the problems encountered in parking-lot management systems via RFID technology. RFID readers, RFID labels, computers, barriers and software are used as for the main components of the RFID technology. The software has been handled for the management, controlling, transaction reporting and operation tasks for parking lots located on various parts of the city. Check-ins and check-outs of the parking-lots will be under control with RFID readers, labels and barriers. In this innovation, RFID reader is located at the side of the parking space, so that it can read the RFID card that belong to the disabled people (authorized person).

An ultrasonic sensor is used in this invention to find any adjacent objects. It is utilised in this instance to find any car parked at the defined spot. It is crucial as a system indicator before activating on the boom gate. There is a RFID Tag attached to every vehicle. RFID reader is embedded into the system and when vehicles approach, the Readers “read” the signals that being broadcasted by the RFID Tags displayed on each vehicle. The RFID reader will turn to read the data from the RFID card as soon as the sensor detects the vehicle in that region. It will notify the green LED to light up if the correct data (OKU personal data) was read. It signifies that the car is registered to the rightful owner thus the boom gate is in passive mode. Conversely, when the RFID reads the incorrect data, the servo motor will automatically activate the boom gate. The owner of the vehicle will hear a buzzer, and they will have five minutes to move the vehicle before it gets stuck behind the boom gate. The management can act in this way towards the owner by suggesting the compound to the offender.



Figure 1: RFID reader and access card



Figure 2: Buzzer



Figure 3: Ultrasonic sensor



Figure 4: Servo motor

COMMERCIAL POTENTIAL

This invention is pertinent because it solves the long-standing problem of finding parking spaces for people with disabilities. By encouraging inclusivity and accessibility for those with disabilities, which is crucial for their mobility and independence, it makes a positive contribution to society.

There is a growing demand for designated parking systems for persons with disabilities (PWD), and the market potential for our innovation is high. According to the Department of Social Welfare Malaysia, the estimated number of PWDs in Malaysia in 2020 was 586,558 and this number is expected to grow with an aging population [3]. The demand for designated parking spaces for PWDs will continue to increase as a result. Furthermore, there are currently no designated parking systems embedded with RFID technology on the market. This innovation provides a unique and valuable solution to the current problem, making it highly marketable.

This innovation provides a simple yet effective solution to the problem of unauthorized parking in designated parking spaces for PWDs. The designated parking system is embedded with RFID technology, which allows only PWDs with authorized access to park in the designated parking spaces. The system includes a boom gate that imposes a fine on drivers who park illegally in the designated parking spaces, as their car will be stuck and unable to leave the parking space.

This innovation's marketability is further strengthened by the fact that it is the first of its kind in the market. As a result, it is expected to generate significant interest among individuals with disabilities and organizations that cater to their needs. The starting price of RM 130.00 is reasonable and competitive compared to other parking products.

Depending on how many units are sold, it can be estimate that this innovation's profit margin. On the other hand, a sizable profit margin can be anticipated given the great demand for this product and the lack of market competition. Since this invention has not yet been launched, there is no sales history. However, market research has been done and it shows potential to be successful in the market.

Investigation and study have been done in order to make sure that this invention is original and hasn't already been patented or trademarked by another business. All required precautions to safeguard our intellectual property has been taken, including filing for the necessary copyrights.

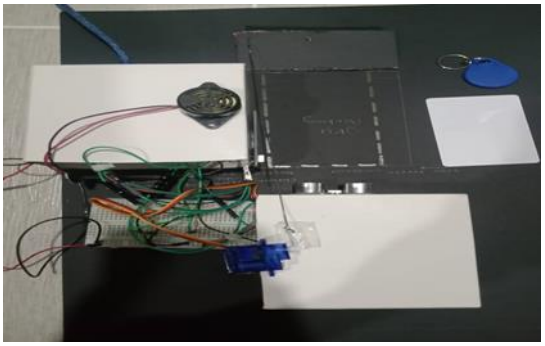


Figure 5: Top view of prototype

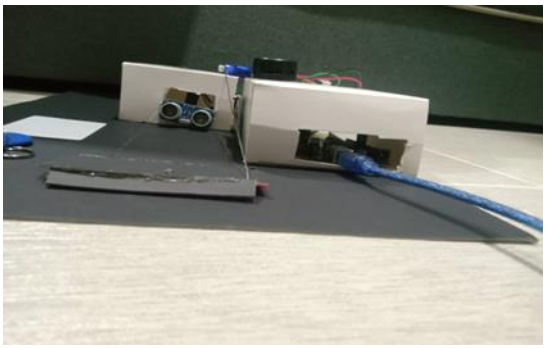


Figure 6: Front view of prototype

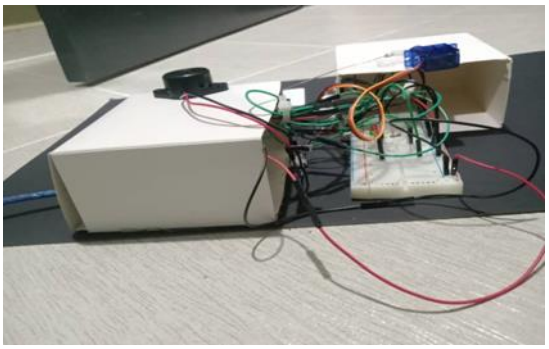


Figure 7: Back view of prototype

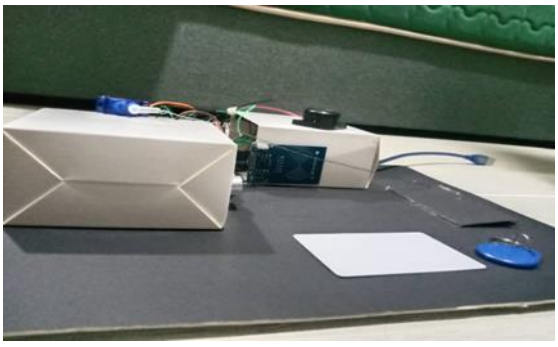


Figure 8: Side view of prototype

CONCLUSION

In conclusion, Designated Parking for OKU with RFID Access is a ground-breaking innovation that addresses a crucial issue faced by disabled individuals in society. This innovation provides an efficient and effective way to control access to disabled parking spaces, reducing conflicts and promoting a more equitable society. The use of RFID technology and ultrasonic sensors make our innovation unique and superior to other parking systems in the market.

As for future development, it is suggested to explore the integration of this innovation with mobile applications to provide real-time information on parking availability and allow for easier access control. Additionally, it is recommended to collaborating with local authorities to expand the implementation of this innovation to public spaces to increase its impact and benefit to the

community.

Overall, Designated Parking for OKU with RFID Access is a remarkable innovation that offers an efficient and reliable solution to the problem of unauthorized usage of disabled parking spaces. It is believed that this innovation has the potential to bring significant positive impacts to society, and looking forward to seeing it implemented widely in the future.

REFERENCES

[1] Gining, R. A. J., Fauzi, S. S. M., Hadi, A. F. A., Razak, M. Z. A., Jamaluddin, M. N. F. (2018). Design and development of disabled parking system for smart city. *Journal of Physics Conference Series*. DOI: 10.1088/1742-6596/1019/1/012016

[2] Fines not stopping misuse of OKU bays. (2017, March 11). *The Star*. Retrieved August 12, 2020, from https://www.thestar.com.my/metro/community/2017/03/11/fines-not-stopping-misuse-of-oku-bays-private-parking-operators-can-also-help-curb-problem-says-coun/

[3] Jabatan Kebajikan Masyarakat. (2021). *Statistik tahun 2020*. Retrieved August 10, 2022, from https://www.jkm.gov.my/jkm/uploads/files/Bahagian%20Pengurusan/Laporan%20Statistik%20JKM%202020_.pdf

[4] Arifin, L. (2021, December 3). Jumlah OKU berdaftar dengan JKM masih rendah. *Berita Harian Online*. Retrieved December 3, 2021, from https://www.bharian.com.my/berita/nasional/2021/12/894942/jumlah-oku-berdaftar-dengan-jkm-masih-rendah

[5] Amsler, S. (2021, March). What Is RFID and How Does It Work? IoT Agenda. https://www.techtarget.com/iotagenda/definition/RFID-radio-frequency-identification

[6] What is an Ultrasonic Sensor? (2019). *Sensor basics: Introductory guide to sensors*. KEYENCE. Retrieved from https://www.keyence.com/ss/products/sensor/sensorbasics/ultrasonic/info/

Automatic Laundry Folding Machine (A.L.F.M)

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ABSTRACT

One of the household chores that all housewives, regardless of whether they work or not, must perform daily is folding clothes. When there are many clothes to fold and need to fold them correctly based on the type of clothing, folding clothes takes a lot of time, and elderly people find it difficult to do this. Finding the appropriate garments will be challenging when more and more clothing is not folded. Folding clothes can be hectic and tiring for some people as it involves physical work and skills. Saving time and lest effort in folding clothes are the main goals of this innovation which lead to creation of Automatic Laundry Folder Machine (A.L.F.M). The Automatic Laundry Folder Machine (A.L.F.M.) was designed to work as intended, with servo motors, Arduino Nano, and Uno serving as the major technological foundation. By pressing the correct button for the right type of clothing to fold, this invention helps the user while they wait for the machine to finish. In other words, user can simply press the corresponding button on the panel to fold a specific type of fabric. The primary focus would be on the elderly because some of them might not have the energy to complete physical tasks around the house. They would be able to work more effectively because of the additional time and energy saved. The device that will offer a neat one-way fold for clothes may be used by busy employees at the clothing department location. Starting at RM200, the pricing is within reach. All in all, the A.L.F.M. wants to help everyone fold their garments more quickly and easily.

Keywords: Folding clothes; less effort; conveniences; custom-made; time-saver

INTRODUCTION

For daily life, clothing is crucial. To maintain the clothing, it always being washed, dried, and folded. There was already automatic washing and drying but folding isn't automatic. Not just for industry, but also for domestic use, automated clothing folding is anticipated. There are many types of clothes folding machines on the market and most of them are large and expensive. As a result, numerous research projects and field tests on automated machines for folding garments have been conducted. As conducted in [1], the automatic folding machine is done by two small robots that folded the clothes from the edge of the table with control from a small camera. This requires some space and several separated gadgets to function.

As introduced by [2], they have similarity with this innovation but limited to one kind of clothes. However [3] introduced a robot to fold clothes that horizontally lying on the flat surface and while hanging vertically from the gravity vector. There also some folding machine powered by photovoltaic as mentioned in [4]. According to [5], washing and drying equipment is widely available. So why can't the awful folding procedure be similarly automated? Over the years, researchers have investigated it, and it has been discovered that robots just struggle with the

task of folding laundry.

The main objectives of this invention that resulted in the creation of the Automatic Laundry Folder Machine (A.L.F.M.) were to save time and require the least amount of work to fold clothing. This is because household chores, particularly folding clothes, take a long time, a lot of effort, and a certain level of ability to execute. As a result, it is thought that the A.L.F.M can compete with existing folding machines due to its low cost and simplicity of use.

INNOVATION DEVELOPMENT

This invention uses a standard clothes folder as a starting point and advances it with the most recent technologies to save time over manual folding. It is enhanced using an Arduino Uno, which serves as the brain, and six servo motors, which drive the clothes-folder elbow actuator. Clothes folding is a quick task that may be accomplished with just one button.

Two buttons make up A.L.M.F, which are used to fold clothing and trousers. The Arduino Uno, which serves as the brain, will send a signal to the servo motors to flip the plates in the proper order when the button has been depressed. Different types of clothing will be folded in different sizes according to a particular sequence order. People will find it easier to fold garments in the right sizes and ways with this.



Figure 1: Automated Laundry Folding Machine (A.L.M.F)

COMMERCIAL POTENTIAL

Due to the previously described issues, the goal of this innovation is to assist people in completing household tasks, notably folding clothes, in less time and with less effort. Due to the hurried lifestyle of today, it is thought that this kind of technology is greatly in demand.

The elderly, occupied workers, stay-at-home mothers, and other people who need to complete basic household tasks with less time and effort will be the target consumers. Given that the current market's products are more expensive while offering essentially the same characteristics, this product is anticipated to enjoy very high demand due to its low pricing. Additionally, this device is hassle-free and easier to use.

Based on the grade of the material used, the product's suggested selling price is roughly starting from RM200, and a profit margin of about 35% of the cost is to be expected. The suggested price is very low compared to products that are already on the market with the same characteristics and therefore can generate high sales. Depending on the customer's preferences, the A.L.F.M can be designed specifically for them. Consumers have a choice in the machine's size, plat material, and motor type. The pricing will change as a result.

CONCLUSION

In conclusion, A.L.F.M achieved it goals in providing tools that help fold clothes faster and with less effort. As for future improvement, adding scanner to the machine will be one of the special features. It used to detect the type of clothes thus automatically fold the cloth accordingly without to press the button manually.

Additionally, it could be enhanced by including an automatic laundry dispenser and receiver. Dispenser is utilised so that the machine doesn't require a person to load it up with fresh garments each time a piece of fabric needs to be folded. The receiver is designed to hold onto the folded clothing until every piece of clothing has been folded, allowing the user to simply wait until every piece of clothing has been folded before gathering it all up at once.

REFERENCES

[1] Watanabe, T., Kawamura, T., Iizuka, K., & Suzuki, S. (2017). Development clothes folding system with small mobile robots. 56th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE), Kanazawa, Japan, pp. 190-193, DOI: 10.23919/SICE.2017.8105731.

[2] Jantan, I. I., Rohizat, N. A., & Karim, N. S. (2020). Clothes Folding Machine. http://repository.psa.edu.my/handle/123456789/3156. Retrieved date: 6 May 2023.

[3] Berg, J., Miller, S., Goldberg, K., & Abbeel, P. (2011). Gravity-Based Robotic Cloth Folding Algorithmic Foundations of Robotics IX, Volume 68. Springer-Verlag Berlin Heidelberg, pp. 409 – 424. ISBN: 978-3-642-17451-3.

[4] Gomesh, N., Daut, I., Kumaran, V., Irwanto, M., Irwan, Y. M., & Fitra, M. (2013). Photovoltaic Powered T-Shirt Folding Machine. TerraGreen 13 International Conference 2013 - Advancements in Renewable Energy and Clean Environment. pp. 313 – 322. https://doi.org/10.1016/j.egypro.2013.07.036

[5] Rachel Treisman, NPR. (2022). The fastest ever laundry-folding robot is here. And it's likely still slower than you. Minnesota Public Radio. https://www.mprnews.org/story/2022/10/22/npr-robot-folding-laundry. Retrieved date: 6 May 2023.

Virtual Hajj and Umrah

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ABSTRACT

"Virtual Haji" is an app to attract the attention of younger generations in the way of performing Hajj and umrah. This idea was prompted when we looked at the difficulty and lack of interest of the young generation in studying the science of Hajj and Umrah. As a solution, we created exciting applications using technology to upgrade the learning methods of Hajj and Umrah to attract attention and be easier to understand and more effective than reading books. "Virtual" which means virtual or something that seems to exist but actually does not exist and "Haji" is the fifth rule of Islam. The main objective of the creation of this application is to provide new learning methods for the younger generation in the implementation of Hajj. Within this app, the user can choose whether to execute Hajj in full or execute separately. This app is suitable for children aged 12 and above. Next, the price to create this application requires only a low cost. The target buyers for this app are parents and educators. We hope with this application, it can give pleasure and make learning more effective for the generation now to master the science of Hajj and Umrah.

Keywords: Hajj; virtual; effective

INTRODUCTION

Hadith and Umrah are the fifth rule of Islam that Muslims should accept if they are able. "Islam is built on five things: to testify that there is no god but Allah, and to bear witness that Muhammad is the Messenger of Allah, to establish the Sabbath, to fulfill the Zakat, to fast in the month of Ramadan and to hide to Baitullah for those who can travel there [1]. Most of the younger generation at this time has a less interest in learning Hajj and umrah. They quickly get bored when they are taught orally by their teachers, especially in the era when technology is being built. Adolescents are also less prone to the execution of Hajj and Umrah because they are not taught practically. In addition, we found that adolescents are very easily affected by gadgets. The younger generation prefers short videos on social media that provide a more attractive visual to watch.

Therefore, we have created an innovation called "Virtual Hajj" to make Hajj learning more effective in the 21st century. We have created one app that can be downloaded by users aged 12 and over on smartphones. This app displays the situation in Mecca and Medina to fulfill Hajj. Users can also choose to perform Hajj in full or separately. For example, users can choose to view the wukuf in Arafah for implementation separately [2]. Next, the user can also choose to perform umrah or haji. For more effective use, the app is also brought by VR (virtual reality) so that the user can feel as if he is in the place of execution with a 360° angle [3]. The price of the app sold is also very affordable and meets the needs of customers. The aim of this study is to facilitate the learning of the young generation in Hajj or Umrah.

INNOVATION DEVELOPMENT

The innovation that is applied to this Virtual Haji product is to take advantage of the increasingly evolving technology transition, i.e., VR technology (virtual reality) and then be used in Virtual Haji revenue. The main function of this product is to make learning and public exposure to Hajj and Umrah wider by using a method that is more interesting than attending a Hajj seminar or demanding science in the classroom. Studies have shown that learning methods conducted with fun methods can make something like science easier to accept by an individual regardless of age [4]. Thus, the main advantage of this product innovation is that users can learn the science of Hajj and Umrah virtually.

The table below shows the differences and similarities between Virtual Hajj and conventional learning methods, i.e., learning in class and attending Hajj seminars.

Table 1: Equations and differences between Virtual Haji and conventional learning methods

Similarities
Exposure and science regarding Hajj and Umrah
The Islamic people were able to perform the 5th Islamic rule.

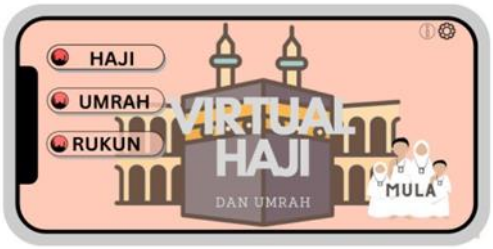
Differences	
Virtual Hajj	**Conventional Learning Method**
Dual language	The use of language is limited when science is delivered
Incorporating a variety of senses	Use only hearing and vision.
Interesting and can interact in virtual reality	Cannot interact directly

How to use:
Use of VR Head Collaboration

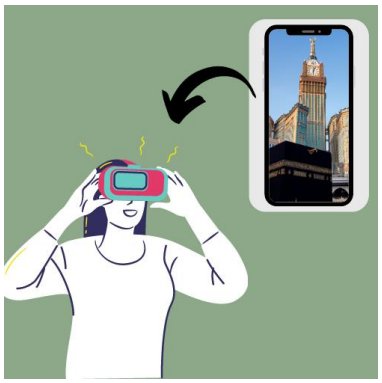
Download the app on your smart phone



Choose the desired mode.



Put your smartphone into the VR set.



Users now start (using Virtual Haji) playing while learning



The Design:

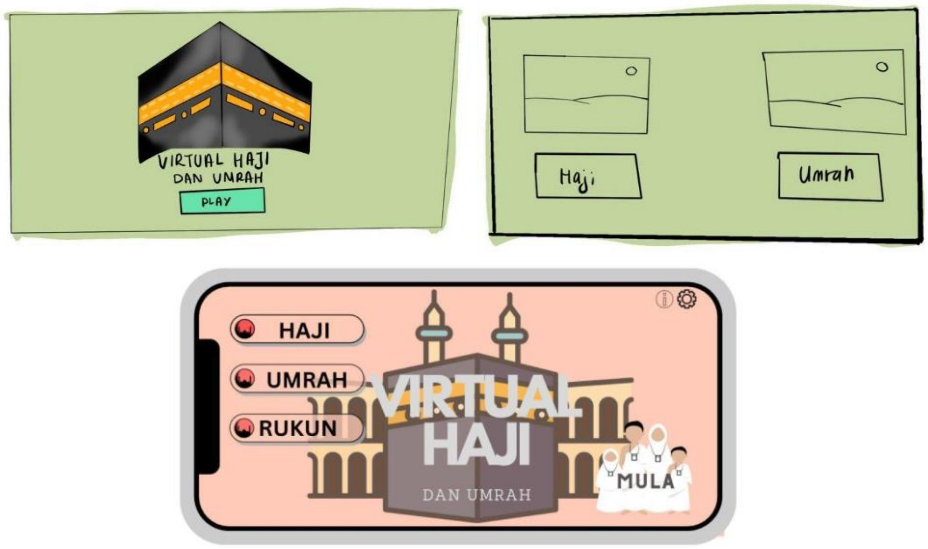


Figure 1: Prototype of innovation (age 1)



Figure 2: Prototype of innovation (Page 2)

COMMERCIAL POTENTIAL

Virtual Haji is a product that is suitable for every layer of society. With the existence of this product, not only those who want to perform Hajj can prepare themselves easily before going to the holy land of Mecca, but it can also attract the interest of younger generations to seek out science about Hajj with the latest technologies. The main objective of this product is for those who want to fulfill the worship of Hajj and Umrah. This simulated learning can make it easier for users to understand every step and deed they need to do while doing Hajj compared to learning through books.

With affordable price offerings, our innovative products can be used many times, anytime and anywhere. It can also be shared. It can not only increase knowledge, but it can also strengthen relationships of human beings. Aside from the individuals who want to perform Hajj and Umrah, parents are also among our primary targets. With this product, children and adolescents can get early exposure to the fifth Islamic Rukun. Interesting ways of learning are obviously easier to focus attention on. we have agreed to set a “Virtual Haji” price of RM 19.99/set. For each purchase, you will receive a ‘VR goggles’ along with a QR code for you to download the app. The profit margin is also estimated at 0.225.

Table 2: Product cost

Materials	Cost
Application development	RM 4.00
VR Box	RM 7.99
Overhead cost	RM 3.50
Total cost	**RM 15.49**
Product price	**RM 19.99**
Total profit	**RM 4.50**

CONCLUSION

Virtual Hajj exists as an alternative for the younger generation to learn how to perform Hajj in an interesting method. By using this app, users will be easier to understand this fifth Islamic rule because it can be seen virtually. This application will be used more frequently with the implementation of improvements. Among them, it adds the choice of execution of worship, such as the prayers of bodies, tayamum and victims. This can give the user an understanding of the practice of worship clearly and also enjoyably. In conclusion, interesting learning methods can create curiosity and encourage the current generation to develop religious science in an effective and compact way.

ACKNOWLEDGEMENT

We must express our gratitude to madam Nik Nurul Akmal binti Ab Alim and Dr. Fadiatul Hasinah Muhammad, our mentors, for her guidance in completing this application prototype. We also sincerely appreciate the help from friends and family in getting everything done. We appreciate the support of the UiTM Dengkil Campus Centre of Foundation Studies in sponsoring this CDU 2023 participant.

REFERENCES

[1] Yussof, A. (2019). Haji, rukun Islam kelima yang wajib ditunaikan jika berkemampuan. Retrieved March 1, 2023, from https://pts.com.my/berita/haji-rukun-islam-kelima-yang-wajib-ditunaikan-jika-berkemampuan.
[2] Tabung Haji. (2021). Kursus Asas Haji (KAH) Siri 5-Wajib Haji. Retrieved March 2, 2023, from https://youtu.be/D6vfFzKhKcc.
[3] Virtual Reality in the Classroom. (2022). University of Toronto. Retrieved March 2, 2023, from https://guides.library.utoronto.ca/c.php?g=607624&p=4938314#:~:text=Get%20Help!-,What%20is%20virtual%20reality%3F,to%20give%20an%20immersive%20experience.
[4] Waith, S. (2010). Teaching and learning outside the classroom: personal values, alternative pedagogies and standards. Retrieved September 23, 2010 from https://www.tandfonline.com/doi/full/10.1080/03004270903206l4

EcoE

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ABSTRACT

EcoE is a comprehensive mobile application that simplifies and enhances users' daily routines while promoting environmental responsibility. This all-in-one app combines scheduling, e-wallet, messaging, and eco-friendly features, making it the only app users need for their daily usage. With the scheduling feature, users can stay organized and up-to-date with upcoming events and even set reminders. The e-wallet feature allows for quick and convenient payments while keeping track of expenditures in one place. The messaging feature enables users to catch up with friends, plan trips, and send money effortlessly. EcoE also includes eco-friendly features that make it easier for users to reduce their carbon footprint. The recycling feature helps users locate nearby recycling centers and learn about proper waste disposal. The e-hailing feature encourages ride-sharing, reducing emissions and traffic congestion. In summary, the Eco E mobile application is a sustainable and practical solution to enhance users' daily lives while promoting environmental responsibility.

Keywords: Eco E; eco-friendly; mobile application; carbon footprint

INTRODUCTION

The world is facing a climate crisis. The effects of climate change are already being felt around the world, in the form of more extreme weather events, rising sea levels, and changes in agricultural yields. If we do not take action to reduce greenhouse gas emissions, the effects of climate change will only get worse.

One of the biggest challenges in the fight against climate change is getting people to change their behaviour. People often don't know how to reduce their environmental impact, or they don't think that their individual actions will make a difference.

EcoE is an app that helps people reduce their environmental impact. The app combines scheduling, e-wallet, messaging, and eco-friendly features, making it the only app users need for their daily usage.

Scheduling

The scheduling feature helps users stay organized and up-to-date with upcoming events and even set reminders. This can help users reduce their environmental impact by reducing the number of last-minute trips and purchases. For example, if a user knows that they have an event coming up, they can plan ahead and walk or bike to the event instead of driving.

E-Wallet

The e-wallet feature allows for quick and convenient payments while keeping track of expenditures in one place. This can help users reduce their environmental impact by reducing the number of paper receipts and credit card statements. For example, if a user uses their e-wallet to make a purchase, they will not receive a paper receipt. This can help to reduce deforestation and pollution from paper production.

Messaging

The messaging feature enables users to catch up with friends, plan trips, and send money effortlessly. This can help users reduce their environmental impact by reducing the number of paper letters and phone calls. For example, if a user wants to send a friend a message, they can use the messaging feature to do so instead of writing a letter or making a phone call. This can help to reduce deforestation and pollution from paper production and energy use from phone calls.

Eco-friendly features

EcoE also includes eco-friendly features that make it easier for users to reduce their carbon footprint. These features include:

Recycling: The recycling feature helps users locate nearby recycling centers and learn about proper waste disposal. This can help users reduce the amount of waste they produce, which can help to reduce pollution and conserve resources.

E-hailing: The e-hailing feature encourages ride-sharing, reducing emissions and traffic congestion. This can help users reduce their carbon footprint and improve air quality.

Carbon footprint tracking: The carbon footprint tracking feature allows users to track their environmental impact and set goals for reducing their carbon footprint. This can help users become more aware of their environmental impact and take steps to reduce it.

In summary, the EcoE mobile application is a comprehensive and sustainable solution to enhance users' daily lives while promoting environmental responsibility. The app's features make it easy for users to reduce their environmental impact, and the app's carbon footprint tracking feature helps users track their progress and stay motivated.

INNOVATION DEVELOPMENT

The EcoE app can be further developed to include the following features:

A Social Media Platform

The app can be developed to include a social media platform where users can connect with each other and share tips on how to reduce their environmental impact. This can help to create a community of people who are working together to make a difference.

A Rewards Program

The app can be developed to include a rewards program where users can earn points for taking actions that reduce their environmental impact. These points can then be redeemed for prizes, such as gift cards or donations to environmental organizations. This can help to motivate users to continue reducing their environmental impact.

A Carbon Offset Program

The app can be developed to include a carbon offset program where users can offset their carbon footprint by donating to environmental projects. This can help to ensure that even if users are not able to completely eliminate their environmental impact, they can still make a positive contribution.

Prototype

The following is a prototype of the EcoE app:



Figure 1: Mockup of EcoE app

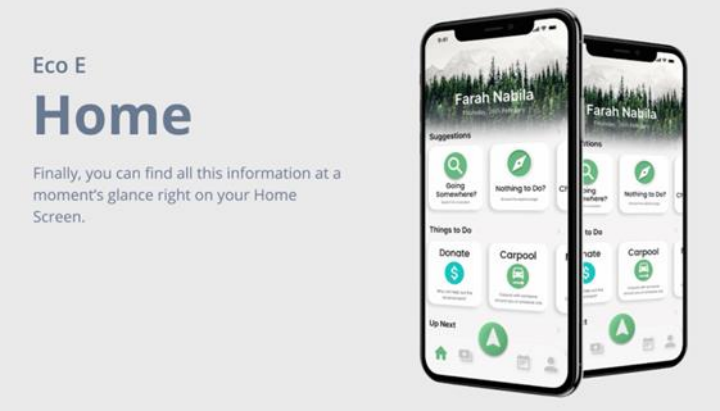


Figure 2: Home screen of EcoE



Figure 3: E-hailing & carpooling section of EcoE



Figure 4: Recycling section of EcoE

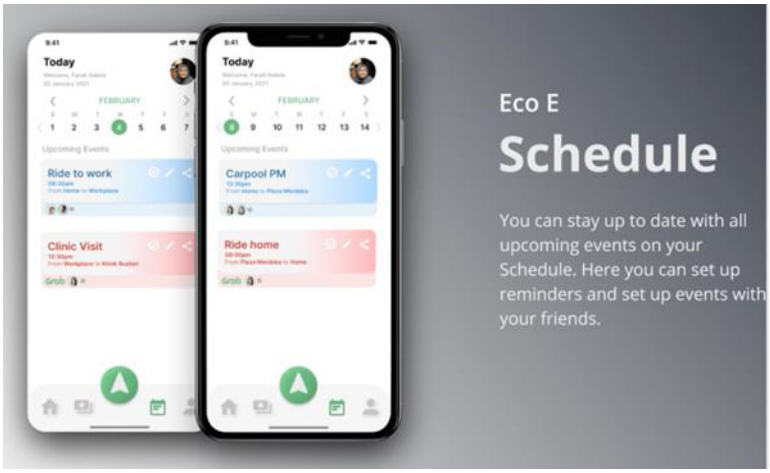


Figure 5: Scheduling section of EcoE

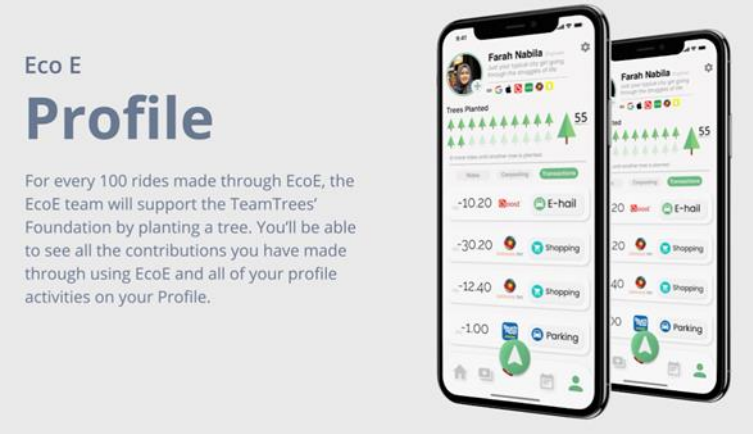


Figure 6: Profile section of EcoE

The app has a simple and user-friendly interface. The main features of the app are located on the home screen. These features include:

Scheduling: The scheduling feature allows users to stay organized and up-to-date with upcoming events and even set reminders.

E-Wallet: The e-wallet feature allows for quick and convenient payments while keeping track of expenditures in one place.

Messaging: The messaging feature enables users to catch up with friends, plan trips, and send money effortlessly.

Eco-friendly features: The eco-friendly features of the app include recycling, e-hailing, and carbon footprint tracking.

Inventive Features

EcoE has several inventive features that make it a unique and valuable tool for reducing environmental impact. These features include:

The social media platform: The social media platform allows users to connect with each other and share tips on how to reduce their environmental impact. This can help to create a community of people who are working together to make a difference.

The rewards program: The rewards program motivates users to continue reducing their environmental impact by rewarding them for taking actions that make a difference.

The carbon offset program: The carbon offset program allows users to offset their carbon footprint by donating to environmental projects. This can help to ensure that even if users are not able to completely eliminate their environmental impact, they can still make a positive contribution.

EcoE is a comprehensive and innovative tool that can help users reduce their environmental impact. The app's features make it easy for users to track their environmental impact, set goals, and take steps to reduce their carbon footprint. The app's social media platform, rewards program, and carbon offset program can help to motivate users to

continue reducing their environmental impact and make a positive contribution to the fight against climate change.

COMMERCIAL POTENTIAL

Relevance of the Invention

EcoE is relevant to the problem of climate change. Climate change is a major challenge facing the world today. It is caused by the release of greenhouse gases into the atmosphere, which trap heat and cause the planet to warm. The effects of climate change are already being felt around the world, in the form of more extreme weather events, rising sea levels, and changes in agricultural yields.

EcoE can help to address the problem of climate change by helping users reduce their environmental impact. The app's features make it easy for users to track their environmental impact, set goals, and take steps to reduce their carbon footprint. The app's social media platform, rewards program, and carbon offset program can help to motivate users to continue reducing their environmental impact and make a positive contribution to the fight against climate change.

Contribution to New Knowledge, Technology, Environment, or Society

EcoE contributes to new knowledge, technology, environment, and society in the following ways:

New knowledge: EcoE provides new knowledge about how to reduce environmental impact. The app's features help users to track their environmental impact, set goals, and take steps to reduce their carbon footprint. This knowledge can help users to make more informed decisions about their environmental impact.

New technology: EcoE uses new technology to help users reduce their environmental impact. The app's features, such as the carbon footprint tracker and the rewards program, are innovative and can help users to make a positive contribution to the environment.

Environment: EcoE can help to improve the environment by helping users reduce their environmental impact. The app's features can help users to reduce their carbon footprint, conserve resources, and protect the environment.

Society: EcoE can help to improve society by helping users reduce their environmental impact. The app's features can help to create a more sustainable society and make a positive contribution to the fight against climate change.

Market Needs and Market Potential

The market need for EcoE is high. There is a growing awareness of the problem of climate change and a desire to take action to reduce environmental impact. EcoE can help to meet this need by providing a convenient and easy-to-use tool for reducing environmental impact.

The market potential for EcoE is also high. The app can be used by individuals, businesses, and organizations to reduce their environmental impact. The app can be used in a variety of

settings, such as homes, offices, and schools. The app can also be used in a variety of industries, such as transportation, energy, and manufacturing.

Interpretation of How the Product Provides the Solution to the User's Needs and Its Marketability

EcoE provides a solution to the user's needs by providing a convenient and easy-to-use tool for reducing environmental impact. The app's features make it easy for users to track their environmental impact, set goals, and take steps to reduce their carbon footprint. The app's social media platform, rewards program, and carbon offset program can help to motivate users to continue reducing their environmental impact and make a positive contribution to the fight against climate change.

EcoE is marketable because it meets a need that is in high demand. The app is also innovative and can help users to make a positive contribution to the environment. The app can be used by individuals, businesses, and organizations in a variety of settings and industries.

CONCLUSION

In conclusion, EcoE is a comprehensive and innovative tool that can help users reduce their environmental impact. The app's features make it easy for users to track their environmental impact, set goals, and take steps to reduce their carbon footprint. The app's social media platform, rewards program, and carbon offset program can help to motivate users to continue reducing their environmental impact and make a positive contribution to the fight against climate change.

EcoE has the potential to make a significant impact on the environment. By helping users reduce their environmental impact, the app can help to mitigate the effects of climate change and create a more sustainable future.

EcoE is still under development, and there are plans to add new features in the future. These features could include:

- A more detailed carbon footprint tracker
- A wider range of eco-friendly features
- A more user-friendly interface

EcoE is a valuable tool for reducing environmental impact. It is easy to use, innovative, and has the potential to make a significant impact on the environment. The app is still under development, but it has the potential to be a powerful tool for fighting climate change.

Here are some recommendations for future development of the EcoE app:

- The app could be expanded to include more eco-friendly features, such as a water footprint tracker and a waste reduction program.
- The app could be made more user-friendly by simplifying the interface and adding more helpful tips and instructions.
- The app could be made more accessible by being translated into more languages.

EcoE is a valuable tool for reducing environmental impact. With further development, it has the potential to be an even more powerful tool for fighting climate change.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the following people for their invaluable support and contributions in the achievement of developing the EcoE app; Universiti Teknologi MARA, Dengkil Campus, the group members of the project being, Muhammad Amir Dzakwan bin Dzulzalani (Leader), Ameer Yusuf bin Muhammad Randie, Nor Fauzan Madihah binti Fissol, Awangko Emir Irsyad bin Awangko Hamdan, our supportive mentor, Mohd Helmy bin Yusof and most importantly Universiti Teknologi MARA (UiTM), Dengkil Campus provided us with the opportunity to complete in this project. We are grateful for the support and guidance we received from the university. Our group members worked hard and dedicatedly to complete this project. We appreciate their contributions and support. Our mentor, Mohd Helmy bin Yusof, provided us with valuable guidance and support. We are grateful for his help in completing this project. We would not have been able to achieve this milestone without the help of these individuals. We are grateful for their support and contributions. We are proud to present the EcoE app to the world. We hope that this app will make a positive impact on the environment and help to promote sustainability.

REFERENCES

[1] Intergovernmental Panel on Climate Change (IPCC). (2021). Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/
[2] United Nations. (2022, February 25). What is climate change? United Nations. https://www.un.org/en/climatechange/what-is-climate-change
[3] United States Environmental Protection Agency (EPA). (2022, February 15). Climate change. EPA. https://www.epa.gov/climate-change
[4] Ismail, M. (2023, March 8). Most Malaysians not sure what they can do to tackle climate change - Expert. The Star. Retrieved from https://www.nst.com.my/news/nation/2023/03/887295/most-malaysians-not-sure-what-they-can-do-tackle-climate-change-expert
[5] The Star. (2022, July 5). The effects of climate change in Malaysia. The Star. Retrieved from https://www.thestar.com.my/lifestyle/health/the-doctor-says/2022/07/05/the-effects-of-climate-change-in-malaysia
[6] Krug, S. (2020). Don't make me think: A common sense guide to improving your users' experiences. Pearson Education.
[7] Hecht, B., & Frampton, C. (2017). The user experience of mobile apps: A systematic literature review. Journal of the Association for Information Science and Technology, 68(1), 23-40.
[8] Kim, J., & Moon, J. Y. (2011). Towards a unified framework of user experience design: A systematic literature review. Computers in Human Behavior, 27(6), 1998-2009.
[9] Bangor, A., Kortum, P. B., & Miller, J. T. (2009). Evaluating the user experience of websites: A practical guide to usability testing. Morgan Kaufmann.

CATEGORY D
School

D-BOX

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ABSTRACT

D-Box helps individuals who work far from their homes to receive their goods safely. Recently, people are facing an issue where their parcel is missing because there is no one at the delivery address to pick up the parcel as it is not secured. Consumer goods delivery found that it was difficult for them to be at the delivery address itself due to a variety of factors. So, by using this product, users can unlock and lock the door of D-Box and check whether their item has been successfully placed into D- Box or not just at their fingertips. All these operations are controlled by Flutter Application, an loT app that has a user-friendly interface. So, this application can be used by anyone regardless of age. D-Box is super affordable, and it gives a huge impact to the user. By using D-Box, users can focus on what they are doing and should not worry about their parcel anymore. Three out of the nine pillars of the Industrial Revolution 4.0 pillars are implemented in D-Box.

Keywords: Delivery box; safety; consumer

INTRODUCTION

Background Statement Based on This Innovation Project

Nowadays, the citizen desires a product which will enhance the lifestyle and the product need to be user friendly. People are facing an issue where their parcel is missing because there is no one at the delivery address to pick up the parcel as it is not secured. Consumer goods delivery found that it was difficult for them to be at the delivery address itself due to a variety of factors.

Problem Statement with Respect to Innovation Project

Problem faced by the people of Malaysia when no one is home. This will however impact towards delivery man and receiver. The absence of parcel recipients at the delivery address during the delivery process can cause many difficulties. Moreover, due to current global pandemic, people are advised to practice social distancing and avoid human contact. This situation will bring some trouble in delivery process. To overcome these problems, we had come out with an idea of enabling a smart, safe, and secured delivery process.

Innovation Project and Why This Innovation Project was Carried Out

To solve the problem mentioned to receive a parcel, D-Box is created to solve the problem. D-Box applies high-tech security control system in line with the Industrial Revolution 4.0 (IR 4.0). D-Box is a user-friendly safety box that can be placed in every home. Usage of ESP8266

NodeMCU as the main micro controllers and the usage steeper motor and driver as the door locking system. It also has been assembled with a DHT11 sensor to detect the temperature and humidity as a safety feature. The usage of IoT is also applied in this D-Box. Three out of nine pillars of I.R 4.0 elements has been used in the project. D Box solve the problem of items delivery when the recipient is absent. Consumer goods delivery found that it was difficult for them to be at the delivery address itself due to a variety of factors. People are facing an issue where their parcel is missing because there is no one at the delivery address to pick up the parcel as it is not secured.

How Innovation Project Help to Solve the Problem

This product will cater the difficulty to receive a parcel hence directly solves problems of loss of goods. By using this product, users can unlock and lock the door of D-Box and check whether their item has been successfully placed into D- Box or not just at their fingertips. All these operations are controlled by flutter application, a loT app that has a user-friendly interface. So, this application can be used by anyone regardless of age. D-Box is super affordable, and it gives a huge impact to the user. By using D-Box, users can focus on what they are doing and should not worry about their parcel anymore. Three out of the nine pillars of the Industrial Revolution 4.0 pillars are implemented in D-Box.

Methodology of This Innovation Project and How to Use It

Initially, research was carried out to determine the problems faced by the public. users can unlock and lock the door of D-Box and check whether their item has been successfully placed into D-Box or not just at their fingertips. All these operations are controlled by flutter application, an loT app that has a user-friendly interface. So, this application can be used by anyone regardless of age. D-Box is super affordable, and it gives a huge impact to the user. By using D-Box, users can focus on what they are doing and should not worry about their parcel anymore. Three out of the nine pillars of the Industrial Revolution 4.0 pillars are implemented in D-Box. From the justification, this product was developed with research questions and research frameworks. The purpose of this research project is to discover answers to questions through the application of D-Box tools.

Research Questions

The main aim of research is to find out the truth which is hidden, and which has not been discovered as yet. Though each research study has its own specific purpose, some general questions of research below:
i) What is the solution for security problems of delivery items.
ii) What is the solution for the problem of item receipt time

INNOVATION DEVELOPMENT

Research Framework

The study is divided into two phases and each phase's output is an input to the next phase. Phase-1 (first phase) we do the literature review and continue with the survey in which the survey is implemented by using a questionnaire. The purpose of this survey is to get some information weather respondent having a trouble in receiving delivery packages and the risk.

Second Phase (Phase-2) involve an evaluation on the solution suggest by respondent. This phase also aimed to evaluate and find the possible solution suggest by respondents and develop the prototype of D-Box as a possible solution for the problem.

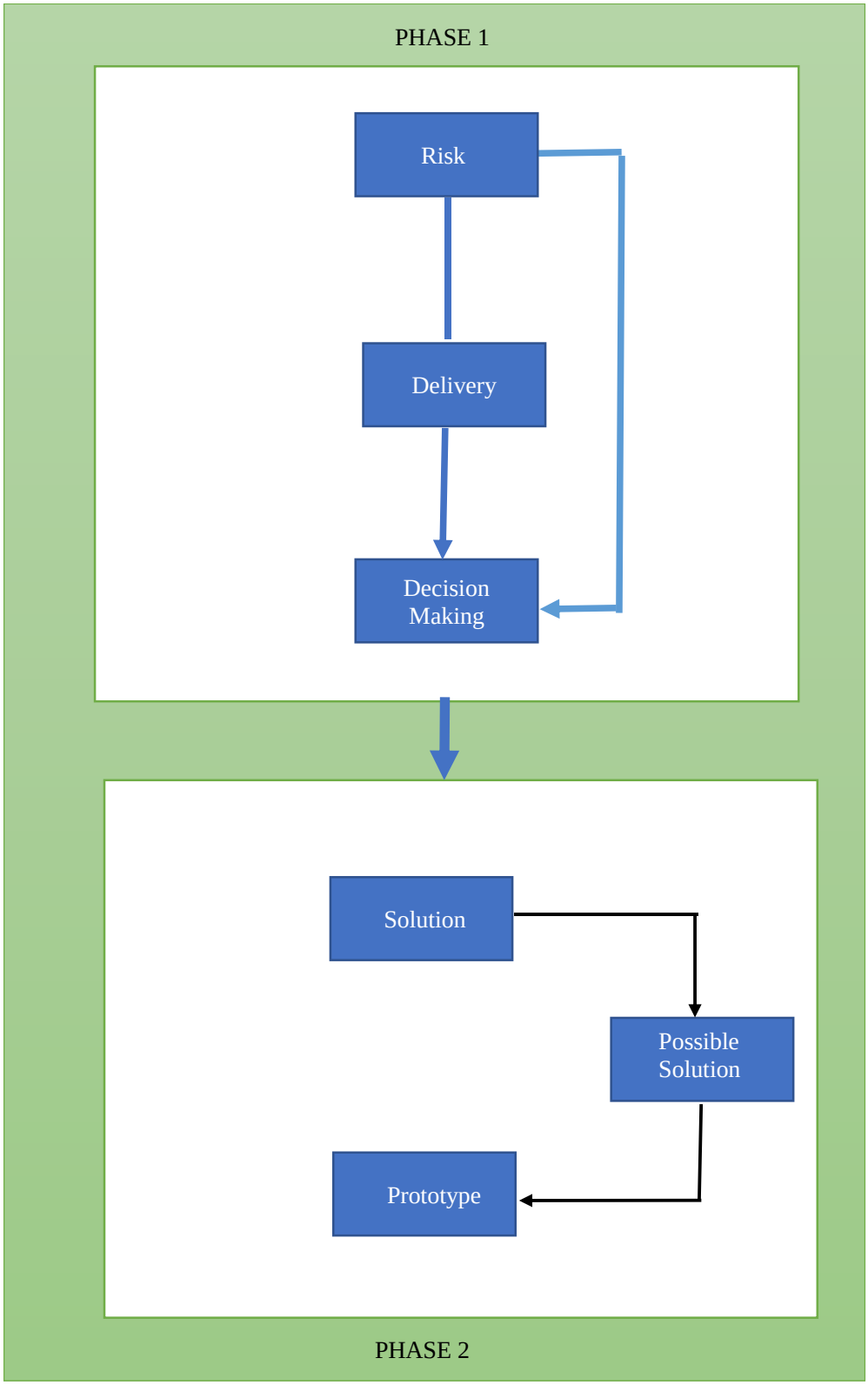


Figure 1: Research framework

Research Method

For the purposes of this research, the writer has decided to use a sciences research tools questionnaires and interviews (Sarantakos, 2013). The questionnaires will be distributed among people from district in Kota Setar which most of them are working. There are 108 of respondent were selected for this survey.

COMMERCIAL POTENTIAL

From the product developed, the in terms of package safety when no one is at home. Both parties, the delivery man and the receiver will benefit. many people are facing an issue where their parcel has lost because there is no one at the delivery address that can pick up the parcel as it is not secured. So, the case of a parcel lost is increasing each day. By using this product, the user will not worry much about their parcel lost because the user can check their parcel from time to time from the apps itself. Also, we have seen many complaints to the courier services towards the issues that the parcel just left there, and it was raining on that specific day. So, the items inside have a defect, especially for electronic items. So that is why D-Box invented with a waterproof material. The result shows positive impact hence saves the end user in a lot of aspects.

Based on the questionnaire, most of our respondents received delivery packages within the range of 0-2 by 55.2% followed by a 3-5 range of 33.3%. Meanwhile, 7.6% of the respondents received delivery packages within the range of 6-8. Ranges 9-11 and >12 have the same number of respondents as 1.9% as depicted in figure 6.

Most of our respondent says that they have experienced a situation where their parcel has arrived at the delivery address, but they were not home. Only 18% of respondent never encountered that situation before as depicted in figure 7.

95% of the respondent says that they are not comfortable with the risk of receiving the package without their presence at the delivery location as depicted in figure 8. So, through all the graph, we can see that D-Box enable a safe delivery process.

CONCLUSION

To conclude, the problem solved with the innovated product hence improve warranty on the packaging. Many people can do anything without the need for packaging that is not at home. The courier also does not have to wait long when using the goods. This can save shipper time. Recipients also do not have to worry if the goods will be damaged due to rain because the D-Box is made using waterproof material.

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The authors can include an acknowledgment to express their appreciation for the support of the sponsors. Include details such as research grant, individual(s), or name(s) of organization/institution.

REFERENCES

[1] Alexander. (2019). Decision problems, risk and uncertainty. https://www.deep-mind.org/2019/05/19/decision-problems-risk-and-uncertainty/

[2] Kusrini, E., Sugito, E., Rahman, Z. M., Setiawan, T. N., & Hasibuan, R. P. (2020). Risk mitigation on product distribution and delay delivery: A case study in an Indonesian manufacturing company. IOP Conference Series: Materials Science and Engineering, 722(1). https://doi.org/10.1088/1757-899X/722/1/012015

[3] Li, G., Hou, Y., & Wu, A. (2017). Fourth Industrial Revolution: technological drivers, impacts and coping methods. Chinese Geographical Science, 27(4), 626–637. https://doi.org/10.1007/s11769-017-0890-x

[4] Sarantakos, S. (2013). Social Research. In Social Science (4th Edition). Red Globe Press.

Papan Pelangi

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ABSTRACT

Dalam menghadapi kemajuan revolusi industri 4.0 tidak ketinggalan sektor pendidikan, Program Pendidikan Khas Integrasi SK Tmn Tun Aminah mengambil inisiatif mencipta "Papan Pelangi" yang mempunyai ciri tarikan emosi MBK yang menarik disamping merangsang daya intelektual (murid berkeperluan khas) dalam membanding beza huruf jawi yang seolah-olah sama bentuk. Terdapat 3 masalah utama iaitu masalah kecelaruan dengan huruf yang seakan sama; masalah lambat untuk memberi respon kerana keraguan dengan huruf yang seakan sama; Masalah Afektif iaitu keadaan mood yang lemah kerana bosan. Kajian ini menggunakan kaedah kualitatif berbentuk deskriptif. Data dikumpul melalui pemerhatian. Sampel dilakukan pada 10 orang pelajar. Pelajar di pantau melalui penilaian bilik darjah berfokus pada pemahaman selapas belajar dan keberkesanan produk yang dilakukan ketika subjek Pend Islam. Hasil mendapati 10/10 murid dapat mengusai huruf yang sama bentuk berlaianan bunyi dan meningkatkan fokus pelajar. Sementara itu, "Papan Pelangi" dapat mengoptimakan keupayaan murid khususnya MBK dalam subjek pendidikan Islam dengan keberhasilan pencapaian melalui penilaian bilik darjah yang dilakukan guru. Dalam pada itu, "Papan Pelangi" direka dengan kompenan teknologi terkini dalam bentuk bahan bantu mengajar yang sesuai dengan peredaran zaman juga mampu menarik minat MBK serta mencapai objektif kajian. Selain itu juga, "Papan Pelangi" direka dengan alatan yang murah dan mudah didapati disampiang kaualiti yang mampu tahan lasak sesuai dengan murid berkeperluan khas.

Keywords: PPKI (Program Pend. Khas Integrasi); Papan Pelangi; MBK (murid berkeperluan khas)

INTRODUCTION

Dalam era globalisasi ini, kementerian pelajaran Malaysia berhasrat teknologi dalam pendidikan khususnya membina alat bantu mengajar sesuai dengan peredaran zaman industri 4.0 yang berorientasikan gadjet dan pelbagai aplikasi. Bersesuaian dengan ini "Papan Pelangi" direka bagi mencapai 4 signifikan masalah utama iaitu; dalam kecelaruan huruf hijaiyah; menarik minat pelajar dan membentuk persekitaran pembelajaran yang selesa; komponen yang mudah didapati dan menggunakan skrin komputer kitar semula, tahan lasak dan boleh di bawa ke mana-mana; membantu guru dan ibu bapa untuk melatih murid berkeperluan khas. Daripada signifikan utama tercetusnya objektif projek iaitu; bahan yang mudah dan murah; alat bantu mengajar yang boleh membantu menangani masalah pelajar khususnya dalam huruf jawi yang seakan bentuknya; meningkatkan minat dan fokus murid dalam belajar. Hal ini berkaitan dengan masalah yang terdapat di pendidikan khas SK Tmn Tun Aminah seperti berikut pertama celaru dengan huruf yang seolah-olah sama bentuknya (ba, ta, tha, ha, ho, ja, ain, ghoin, shin, syim, sot, dhot, tho, dzho, fa, qof) kedua Memakan masa yang panjang untuk membandingbeza huruf yang seolah-olah sama bentukannya (ba, ta, tha, ha, ho, ja, ain, ghoin, shin, syim, sot, dhot, tho, dzho, fa, qof) ketiga Cepat hilang tumpuan dan mudah bosan. Masalah ini terbentuk

berdasarkan keputusan murid melalui penilaian bilik darjah yang dijalankan.

Kompenan item “Papan Pelangi” seperti Acrylic a4 saiz sebagai based, Bateri 3.7v menyimpan kuasa, Charger modula untuk mengecas bateri, DC convanter, Led lampu untuk menarik perhatian, Suis, Potentiometer boleh melaras kecerahan lampu. Untuk proses pembinaan litar “Papan Pelangi” disolder dengan rapi dan kemas suapaya tidak tertanggal antara wayar penyambung.

INNOVATION DEVELOPMENT

Dalam kajian Kulop Saad dan Ahamad (2000), 70% faktor yang membezakan sesebuah kelas ialah apabila setiap murid mempunyai perbezaan dari segi psikologi, keupayaan intelektual dan tingkahlaku bagi setiap individu yang memberbeza antara kelas. Dengan penyataan ini SK Tmn Tun Aminah mengambil inisiatif untuk berinovasi ‘Papan Pelangi’ khusus untuk murid berkeperluan khas yang terdapat 3 masalah utama iaitu masalah kekeliruan dengan huruf yang seakan sama; masalah lambat untuk memberi respon kerana keraguan dengan huruf yang seakan sama; Masalah Afektif iaitu keadaan mood yang lemah kerana bosan.

Kajian yang dilakukan oleh Thondike pula, guru perlu membuat pentaksiran dalam bilik darjah dan penilaian bagi setiap murid bagi memastikan murid sedia dan boleh menerima pelajaran. Perkara yang perlu diambil perhatian adalah (emosi, intelektual dan keberkesanannya). Thondike mencadangkan kaedah warna-warni bagi mempengaruhi pelajar. Selain itu, boleh juga dengan kaedah token atau pujian positif. Oleh itu, berinspirasikan kajian Kulop Saad dan Thondike, PPKI Sk Tmn Tun Aminah mengambil inIsiatif mencipta “Papan Pelangi” yang mempunyai ciri tarikan emosi MBK yang menarik disamping merangsang daya intelektual MBK dalam membanding beza huruf jawi yang seolah-olah sama bentuk.

Menurut Gani et. Al 2006, dalam era globalisasi ini, Adaptasi teknologi dalam pendidikan khususnya membina alat bantu mengajar sesuai dengan peredaran zaman industri 4.0 yang berorientasikan gadjet dan pelbagai aplikasi. Bersesuaian dengan ini “Papan Pelangi” direka bagi mencapai 4 signifikan utama iaitu; menyelesaikan masalah MBK dalam kecelaruan huruf hijaiyah; menarik minat pelajar dan membentuk persekitaran pembelajaran yang selesa; komponen yang mudah didapati dan menggunakan skrin komputer kitar semula, tahan lasak dan boleh di bawa ke mana-mana; membantu guru dan ibu bapa untuk melatih MBK.

Kajian menggunakan kaedah kualitatif berbentuk deskriptif. Data dikumpul melalui pemerhatian. Sampel dilakukan pada 10 orang pelajar sahaja kerana dikalangan pelajar yang boleh menyebut berbanding murid pendidikan yang lain. Pelajar berusia 13-14 tahun. Pelajar di pantau melalui penilaian bilik darjah berfokus pada pemahaman selapas belajar dan keberkesanan produk yang dilakukan ketika subjek Pend. Islam.

COMMERCIAL POTENTIAL

“Papan Pelangi” dapat menyelesaikan kesulitan masalah yang terdapat di atas dengan; Pengulangan sebutan, Penulisan yang mudah dipadam dan lampu yang menarik minat dan perhatian pelajar semasa PdP dijalankan sehingga akhirnya murid berkeperluan khas mendapat manfaat ilmu dan kemahiran yang baharu. Proses ini akan membantu MBK memperoleh keupayaan pemahaman dengan melakukan proses pengulangan berbentuk lisan semasa menyebut huruf yang seolah-olah sama. Dengan latih tubi yang bersistem ini dapatlah membantu MBK untuk membezakan pengetahuan yang lama dan huruf yang baru dipelajari

berorientasikan imejan dan visual.

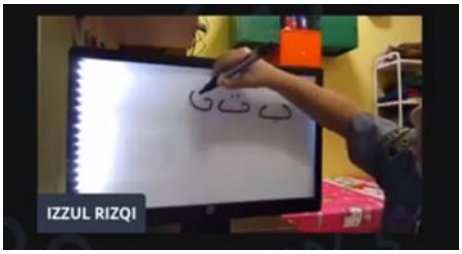


Figure 1: Papan Pelangi

Penyediaan alat bantu mengajar sebelum memulakan pengajaran amat mencabar apabila berhadapan dengan murid pendididkan khas, sebagai guru yang mengajar murid pendidikan khas penilaian kemampuan murid dan tingkahlaku bagi setiap murid perlu diambil kira. Rentetan daripada ini, 4 elemen utama dititikberatkan untuk menyiapkan "Papan Pelangi" seperti; ketahanan keupayaan produk, elemen menarik minat murid pendidikan khas segi intelek dan tingkahlaku, keberhasilan murid dan akirnya memudahkan guru dan ibu bapa. Elemen pertama "Papan Pelangi" Ketahanan keupayaan produk dengan pemilihan kompenan item elektronik seperti Acrylic a4 saiz, Bateri 3.7v, Charger modula, DC convanter, Led, Suis, Potentiometer kompenan ini didapati di kedai elektronik. Untuk proses pembinaan litar "Papan Pelangi" disolder dengan rapi dan kemas suapaya tidak tertanggal antara wayar penyambung. Elemen kedua, menarik minat MBK segi intelek dan tingkahlaku "Papan Pelangi" disinari dengan lampu putih LED dan diletakkan ke dalam skrin komputer yang dikitar semula ini yang membuatkan tarik minat MBK. Seterusnya elemen ketiga, keberhasilan murid dengan membuat penilaian bilik darjah menilai perkembangan setiap kali subjek pendidikan Islam. Akhirnya elemen keempat ialah membantu guru dan ibu bapa untuk membuat pengukuhan dengan pengulangan penulisan dan senag diurus dipadam. Selain daripada empat elemen di atas keistimewaan lain "Papan Pelangi" ini adalah mudah digunakan dibawa ke mana-mana dan boleh disimpan tanpa memakan ruang yang besar seperti dalam laci meja.

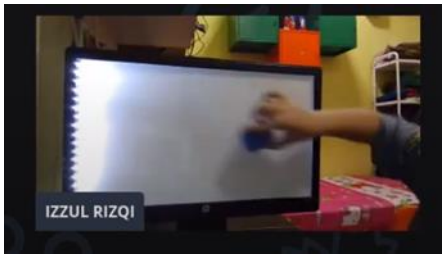


Figure 2: Papan Pelangi

CONCLUSION

Reka cipta "Papan Pelangi" dapat mengoptimakan keupayaan murid khususnya MBK dalam subjek pendidikan Islam dengan keberhasilan pencapaian melalui penilaian bilik darjah yang dilakukan guru. Dalam pada itu, "Papan Pelangi" direka dengan kompenan teknologi terkini dalam bentuk bahan bantu mengajar yang sesuai dengan peredaran zaman juga mampu menarik minat MBK serta mencapai objektif kajian. Selain itu juga, "Papan Pelangi" direka dengan alatan yang murah dan mudah didapati disamping kualiti yang mampu tahan lasak sesuai dengan murid berkeperluan khas. Jelaslah bahawa, "Papan Pelangi" sesuai untuk murid berkeperluan khas bagi menangani masalah kecelaruan untuk membeza dan menyebutkan

bentuk huruf hijaiyah yang sama tetapi berbeza sebutan.

REFERENCES

[1] Kulop Saad, A. A., Ahamad, A. (2000). *Keberkesanan bahan pengajaran multi interaktif*.
[2] Mohamed Nor, K. (1993). Kaedah *pembelajaran berkesan*. Cahaya Pantai M Sdn. Bhd.
[3] N. S. Mohd Faiz, M. Mohamed, R. Zahit. (2006). *Gaya pembelajaran pelajar cemerlang-satu kajian dalam membantu meningkatkan kualiti pembelajaran.* Seminar Kebangsaan Pendidikan Teknik dan Vokasional 2006, Johor. 29–38.

TREHAFE (TREAT BEAUTY HEALTHY SAFE)

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ABSTRACT

The TreHafe Eczema Cream Product (Treat,Beauty,Healthy,Safe) is believed to be safe from alcohol. The hypothesis of this project is that the Eczema Cream can moisturize dry skin. Ingredient A, put beeswax and shea butter and heat it until it melts. Remove and let it cool to 40 degrees centigrade. Ingredient B, put 1 drop of vitamin E, 3 drops of geranium, 5 drops of lavender, 2 drops of chamomile/calendula and stir until well mixed. Ingredient C add sunflower 22 g, hemp seed 10 g calendula/camomile 5 g (ingredient A enter in part C). A (can change ring for ringworm and ringworm). B (You can also change the smell of neem oil) Can be changed.

Keywords: Eczema; vitamins; moisturize

INTRODUCTION

Eczema is an infectious disease of the skin that is accompanied by swelling, itching and a red rash that sometimes looks like a watery burn. If prolonged it will cause itching. Eczema is often found on the face, the middle of the elbows and even the knees. The affected skin will become crusty.

INNOVATION DEVELOPMENT

We modified it with this lipstick shape cream. Lipstick shape cream can also be taken anywhere. In addition, it avoids more exposure to finger contact that contains harmful microbes than placed in the jar container in the market today. Besides, it can be used as a lip balm.

COMMERCIAL POTENTIAL

We feel it can be sold since the eczema cream industry always uses standard ingredients. Suitable for both men and women with all skin types.

Simple to use, pocket size. The mini size can put it in handbag, purse, school bag and even pockets and use it anytime though for a quick little hydration boost of your skin. It is cheaper than in the market and it has high quality.



Figure 1: Innovation prototype

We use eczema cream lipstick because easy to carry and easy to use at any time anywhere. The moist mist moisturizes and instantly soothes the skin. This technology use for skin caring suitable for all kind of skin.

Tables

All tables should be inserted (see sample below) and labelled Table 1, and Table 2, followed by others. The header for each table should be centred and placed at the top.

Table 1: Formula treatment cream for eczema & sensitive skin

Content	Percent %
Sunflower oil	43.9
Hemp seed oil	20
Calendula infused oil	10
Shea butter	10
Beeswax	15
Lavender essential oil	0.5
Geranium essential oil	0.3
Chamomile essential oil	0.2
Vitamin E	0.1

Table 2: Formula treatment cream for eczema & sensitive skin (100 g)

Content	Weight (g)
Sunflower oil	43.9
Hemp seed oil	20
Calendula infused oil	10
Shea butter	10
Beeswax	15
Lavender essential oil	0.5
Geranium essential oil	0.3
Chamomile essential oil	0.2
Vitamin E	0.1

CONCLUSION

In conclusion, topical eczema cream can help cure really severe skin inflammation and can provide relief from skin irritation. Additionally, it can smooth out our skin. In addition, it is safe for everyone to use and may be utilised for infants.

ACKNOWLEDGEMENT

We are incredibly appreciative of our teachers' ongoing encouragement and assistance.
We sincerely dedicated to Puan Baizura Norida Binti Mohamad Noor, Puan Nur Farhana Binti Mohammed Lazim and Puan Ruzita Binti Jusoh as well as our principal Encik Azahar Bin Ali who gave us the opportunity to do this innovation project which is TreHafe (Treat Beauty Healthy Safe). Our completion of the research could not have been accomplished without the support of our team members, Nurul Qurratuaini Bariah binti Kharudin, Alya Maisarah binti Ahmad Kamil, Ahmad Thariq Al Habibi. Thank you for allowing your time away to research, review and write. We express our heartfelt gratitude for the learning possibilities offered, which greatly aided us in completing this innovation project in the allotted time.

REFERENCES

[1] Evans, A. N. & Rooney, B. J. (2014). Kaedah dalam penyelidikan psikologi. SAGE Publications.
[2] Kantowitz, B. H., Roediger, H. L., & Elmes, D. G. (2015). Psikologi Eksperimen. Stamfort, CT: Pembelajaran Cengage.
[3] Mohd. Tahir, I. & Abu Bakar, N. M. (2007). Business students' belief in learning mathematics. Jurnal Kemanusiaan, 5(2).
[4] What is Coaching? (n.d.). | SkillsYouNeed. Retrieved 20 September, 2021, from https://www.skillsyouneed.com/learn/coaching.html
[5] Poverty and Its Impact on Students' Education. (2021, March 8). NASSP. Retrieved September 24, 2021, from https://www.nassp.org/poverty-and-its-impact-on- students-education/
[6] Jansen, D. (2021, 28 June). What Is Research Methodology? Simple Definition (With Examples). Grad Coach. https://gradcoach.com/what-is-research-methodology/
[7] Makarim, F. R. (11 Oktober 2022}. Manfaat bunga mawar bagi kesehatan dan kecantikan kulit. https://www.halodoc.com/artikel/manfaat-bunga-mawar-bagi-kesehatan-dan-kecantikan-kulit/
[8] Shida Mohamed. Homebiz Empire, Kelas Skincare, February 1, 2022.

FACEMIST SPEUROS (SPECIAL NATURE ROSE)

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ABSTRACT

Facemist Speuros (Special-Nature-Rose) products made from rose flowers, believed to be safe from alcohol. The hypothesis of this product is that roses have vitamins A, C and E and have calcium. The first step is to prepare 2 rose flower, 100 ml distilled water, liquid germal plus (preservative) 1% (20 drops = 1g) and a bottle spray 100 ml. The second step, pick a single rose flower and the rose until it is believed to be clean. The third step, dry the flower and then dissolve the flower petals that are then inserted into an empty jar. The fourth step, put distilled water in a different jar but make sure, the distilled water is 100ml.The fifth step, boil the distilled water using the distillation process and pour it into the jar containing the flower petal. The sixth step, set it until the color of the petal is produced then let the water cool for a few minutes. The seventh step, filter the distilled water and separate the contents. The eighth step, put 20 drops of germal plus liquid. Last step, put it in an empty bottle.

Keywords: Face mist; vitamins; rose

INTRODUCTION

Face mist is a skincare product that rehydrates and moisturizes your skin with calming ingredients. It also provides with the necessary nourishment and a spritz of revitalisation, especially when outdoors. Just like it sounds, a face mist is a skin care product that use spray on your face. There are lots of different types out there, and for the most part they deliver an instant hit of hydration with ingredients like 95% water, vitamins, extracts, and essential oils. Some have additional skin care benefits like controlling excess oil, calming stressed skin and offering anti-aging properties. We use roses because it also supports the body's natural collagen production, our body's protein responsible for healthy skin, nails and hair loaded with anti-inflammatory and antibacterial properties, roses can also help ease breakouts and calm skin conditions such as eczema and rosacea. Sip and glow on.

INNOVATION DEVELOPMENT

We use nano mist spray because increases the moisture of the skin without damaging any cosmetics. The moist mist moisturizes and instantly soothes the skin. This technology use for skin caring suitable for all kind of skin. Perfect for keeping your face hydrated and healthy. This handy portable nano face mist makes feels relaxing and cool on a hot day and helps the skin stay hydrated during the hot season. Nano mist spray produces smaller molecules and a faster rate of absorption into the skin layer.

COMMERCIAL POTENTIAL

We believe it can be marketed, it is because the face mist market they always use normal spray. Ideal for quick recovery of skin vitally in the office, airplane, outdoor, home etc. Suitable for all skin types for women and men. USB charging, simple to use, pocket size. The mini size can put it in handbag, purse, school bag and even pockets and use it anytime though for a quick little hydration boost of your skin.



Figure 1: Innovation prototype

Tables

We use nano mist spray because increases the moisture of the skin without damaging any cosmetics. The moist mist moisturizes and instantly soothes the skin. This technology use for skin caring suitable for all kind of skin.

Table 1: Formula of face mist in percent

Content	Percent %
Rose petal	33.11
Distilled water	66.23
Liquid Germal Plus	0.66

Table 2: Formula of face mist in gram

Content	Weight (g)
Rose petal	50 (a)
Distilled water	100(b)
Liquid Germal Plus	1(c)

Equations

$$½b + a + 100c = d$$

CONCLUSION

In conclusion, it is hoped that Facemist Speuros (Special-Nature-Rose), products innovation can provide many benefits, especially to those responsible for skin health. Among other things, it allows the skin health department to reduce the rate of skin diseases with this skin health is guaranteed.

ACKNOWLEDGEMENT

We cannot express enough grateful to our teachers for their continued support and encouragement Puan Baizura Norida Binti Mohamad Noor, Puan Nur Farhana Binti Mohammed Lazim and Puan Ruzita Binti Jusoh as well as our principal Encik Azahar Bin Ali who gave us the opportunity to do this innovation project which is Facemist Speuros (Special Nature Rose). Our completion of the research could not have been accomplished without the support of our team members, Nur Aisyah Batrisyia Binti Azmee, Muhammad Danial Hakimi Bin Mohd Latiff and Muhammad Afiq Najmie Bin Muhammad Zaidi. Thank you for allowing your time away to research, review and write We offer our sincere appreciation for the learning opportunities provided and helped us a lot in finalizing this innovation project within the limited time frame.

REFERENCES

[1] Latham, G. P. (2006). Motivasi kerja: Sejarah, teori, penyelidikan, dan amalan. Penerbitan Sage.
[2] Likert, R. (1932). Teknik untuk pengukuran sikap. Arkib Psikologi 140, 1-55.
[3] Abdul Ghaffar, M. N. (2003). Reka bentuk tinjauan soal selidik pendidikan. Universiti Teknologi Malaysia.
[4] Mohd. Tahir, I. & Abu Bakar, N. M. (2007). Business students' belief in learning mathematics. Jurnal Kemanusiaan, 5(2).
[5] Lazim, M. A., Abu Osman, M. T., & Wan Salihin, W. A. (2004) The statistical evidence in describing the students' beliefs about mathematics. International Journal for Mathematics Teaching and Learning.
[6] What is Coaching? (n.d.). SkillsYouNeed. Retrieved 20 September, 2021, from https://www.skillsyouneed.com/learn/coaching.html
[7] Cherry, K. (n.d.). Bagaimana pembolehubah yang digunakan dalam penyelidikan psikologi? bagaimana pembolehubah yang digunakan dalam penyelidikan psikologi? Retrieved September 20, 2021, from https://ms.reoveme.com/bagaimana- pembolehubah-yang-digunakan-dalam-penyelidikan-psikologi/
[8] Jansen, D. (2021, 28 June). What Is Research Methodology? Simple Definition (With Examples). Grad Coach. https://gradcoach.com/what-is-research-methodology/
[9] Makarim, F. R. (11 Oktober 2022}. Manfaat bunga mawar bagi kesehatan dan kecantikan kulit. https://www.halodoc.com/artikel/manfaat-bunga-mawar-bagi-kesehatan-dan-kecantikan-kulit/

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