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"Empowering Students Towards Educational Innovation"

3rd January - 4th February 2022

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ABOUT PPT

UiTM offers a Pre-Higher Education Programme or Program Pra Pendidikan Tinggi (PPT) that assists SPM graduates with academic strengthening activities at the Pre-Diploma level. Students who pass the Pre-Diploma will be absorbed into Diploma studies, which will give them more opportunities to continue their studies at the Bachelor's, Master's, and Doctor of Philosophy levels.

Pra Pendidikan Tinggi (PPT) UiTM was previously known as *Program Mengubah Destini Anak Bangsa* (MDAB). The programme is based on the university's philosophy, which reckons that, through the transfer of knowledge and the application of noble values, an individual is capable of striving for excellence.

The PPT programme's major goal is to enrol students who have graduated from Sijil Pelajaran Malaysia (SPM) but whose SPM results do not fulfil UPU's requirements. The PPT programme is offered to both B40 and non-B40 students, allowing them to advance their education.

FOREWORD MESSAGE

by Director of PPT

First and foremost, I would like to extend my most resounding praise to Allah S.W.T who has bestowed His blessing to us in producing the PPTNVIC 2022 E-Proceedings.

My heartiest congratulations to the Pejabat Program Pra Pendidikan Tinggi for successfully organizing the very first PPT UiTM National Virtual Innovation Competition 2022 which is the foundation of this extended abstract book. This programme would not have happened without the synergy between the organizing committee, participants and the sponsors.

Alfred North Whitehead, a British Mathematician, logician and philosopher once mentioned that "Ideas won't keep. Something must be done about it." All of us have great ideas but what matters is what we do with the ideas. This extended abstract e-proceedings records the ideas from students, facilitated by the lecturers, materialized into a form of innovation.

Once again, my deepest appreciation and congratulations to the Pejabat Program Pra Pendidikan Tinggi for providing the students an outlet to do something about their ideas instead of just keeping it.

It is also impossible to miss the note that PPTNVIC E-Proceedings was morally and physically supported by our outstanding coordinators, lecturers, students, volunteers and most importantly our honourable jury. It is very grateful to have those mentioned as our expertise contributors in making this extended abstract e-proceedings a success.

As for the pre-diploma students, may this participation be a kickstart to many more innovation and creative products in the future.

Thank you.

Assoc. Prof. Ts Dr Aini Jaapar
Director of Pra Pendidikan Tinggi (PPT),
Universiti Teknologi Mara (UiTM) Malaysia

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PREFACE

Designed for both B40 and non-B40 students, Pra Pengajian Tinggi (PPT) UiTM or formerly known as Program Mengubah Destini Anak Bangsa (MDAB) has been offering a second chance to countless number of students with potential but less than stellar SPM results. Currently, it houses five pre-diploma programmes namely Pra Diploma Perdagangan, Pra Diploma Sains, Pra Diploma Agroteknologi, Pra Diploma Sains (Aliran STEM C dan Sastera) and Pra Diploma Pengajian Islam. To date, students from these programmes have shown remarkable achievements in academic performance and participations in national as well as international competitions.

This year marks another milestone for the office with the first PPT UiTM National Virtual Innovation Competition 2021 (PPTNVIC 2021). This innovation competition is an open door for the students and lecturers to exhibit creative minds stemmed from curiosity. A number of e-content projects have been evaluated by esteemed judges and that has led to the birth of this PPTNVIC E-Proceedings. Ideas and novelty are celebrated and participants are applauded for displaying ingenious mind in their innovations.

It is hoped that such an effort continues to breed so that there is always an outlet for these creative minds to grow.

LIST OF EXTENDED ABSTRACTS

EDUCATIONAL GAMING

ONLINE TEACHING LEARNING STRATEGIES

STEM EDUCATION

VIRTUAL ONLINE LABORATORIES

EDUCATIONAL GAMING

A DIGITAL GAME FOR LEARNING BASIC CALCULUS: A CONCEPT PAPER

Nurul Aityqah Yaacob[1], Nadiah Mohamed[1], Mardiana Ahmad[2], Wan Faizatul Syarlinny Wan Suhaimi[2], Syahirah Shareza[2], Rabiatul Adawiyah Abdul Halim[2]

[1]Faculty of Computer and Mathematical Sciences. Universiti Teknologi Mara Cawangan Negeri Sembilan, Kampus Kuala Pilah, 72000 Kuala Pilah, Negeri Sembilan, Malaysia;
[2]Faculty of Applied Sciences Universiti Teknologi Mara Cawangan Negeri Sembilan, Kampus Kuala Pilah, 72000 Kuala Pilah, Negeri Sembilan, Malaysia:
[3]Department

Corresponding author e-mail: aityqah@uitm.edu.my

ABSTRACT

The COVID-19 pandemic has caused many teachers around the world to abruptly switch from face-to-face to online teaching. Digital games can provide the context and environment in reinforcing the learning of basic calculus in class. The game strategy makes learning meaningful, varied and fun. This study is unique as it seeks to integrate appropriate elements of a digital game design with that of calculus education; thus, making learning fun, engaging and consequential. The purpose of this article is to discuss the feasibility of utilizing open distance learning to extend educational opportunities for pre-diploma students enrolled in institutions of higher education. This paper explores the benefits of using digital games to deliver an inclusive education to pre-diploma students and makes recommendations based on the findings of a literature research.

Keywords: digital game, fun learning, calculus.

1. INTRODUCTION

As a dualistic discipline, mathematics comprises both processes and calculations as well as conceptual structures that link these two aspects together [1]. Mathematical thinking is a comprehensive method that analyzes the patterns that arise from the breakdown of things to their numerical, structural, or logical essentials. Concerns about students' inability to reason and think mathematically cannot be taken lightly. What is challenging to the students is their attempt to make appropriate connections amongst mathematical concepts. A long list of terms to memorize and complex calculations to complete is not enough.

Educators need to provide a more meaningful and realistic environment for them to practice their mathematical skills and reinforce understanding. The game board strategy makes learning meaningful, varied and fun. Other than the traditional way of teaching, educators or educational researchers have used other ways since there are many game applications such as video, simulation and online. Games and simulations are educational initiatives that foster the acquisition of knowledge across subjects and disciplines by students [2]. These applications have been used as instructional tools in a variety of disciplines such as biochemistry, psychology, biology, etc. These methods have increased students' positive effects, namely the development of social and soft skills, emotional skills, the empowerment of collaboration with peers, and the promotion of interaction and feedback [2]. Moreover, crossword puzzles and Jeopardy-like games have been used for assignments and review sessions resulting in a positive impact on examination results and students' learning skills [3]. [4] also believed that puzzles, scenarios, or word puzzles can trigger students' critical thinking if the activity goals are clear and understandable by students.

Based on the previous research, students' attitudes toward mathematics mostly include anxiety, cynicism, fear, and contempt. Control in performing, positive math attitudes, beliefs about math, and adaptive perfectionism were all linked to better math achievement [5]. Math anxiety and maladaptive perfectionism, on the other hand, were linked to lower math achievement. These attitudes may have an effect on their math learning process. It might impact how well students learn math, how efficiently they apply what they learn outside the classroom, and their intention to continue taking further math classes. According to [6], teachers found technology to be useful in fostering mathematical thinking and communication. While a number of active learning techniques exist, games are becoming an increasingly popular tool used to encourage student involvement with the course material [3]

Many students today struggle to make connections between similar subjects within a single field of study. In most cases, students just recall the formula to assist them in solving common issues. Mathematics can be more easily learned through the use of an interactive learning tool which makes studying meaningful and enjoyable by utilizing a digital gaming approach. According to [7], a principal component analysis using the Varimax rotation approach identified six domains as motivation, novelty, enjoyable learning, commercialization, product attributes, and eco-friendliness. The findings suggested that these six critical criteria were considered while evaluating a learning tool and its potential for teaching any tough subject in an engaging and fascinating manner while retaining rigor.

The purpose of this research is to ascertain the effectiveness of digital games in terms of memorization and comprehension of fundamental differentiation concepts, as well as to identify the characteristics of digital games that influence the learning of introductory calculus among pre-diploma students at a public university. This article is structured as follows: Section 2 discusses the proposed methodologies for developing and accessing digital games as a tool in teaching differentiation strategies to pre-diploma students, and Section 3 concludes the research.

2. EXPERIMENTAL DESIGN AND PROPOSED METHODOLOGY

Data will be collected qualitatively and quantitatively. A set of pre-prepared guided questions will be used in the interviews. All interviews will be videotaped or recorded to provide qualitative data. In general, students' interviews will last for about 45-60 minutes. The transcriptions will then be qualitatively analyzed by comparing the similarities and differences between students and supported by quotations from their oral responses. Apart from that, the students will be given a pre-test, post-test and three quizzes to provide quantitative data (see Figure 1). The figure below shows the design for the proposed data collection.

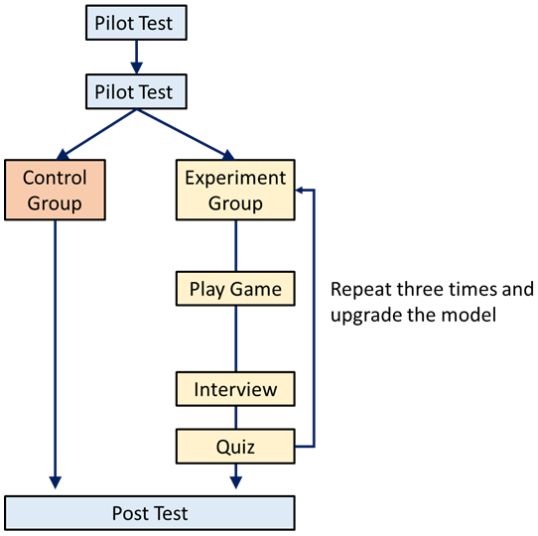

Figure 1: Proposed research design for data collection

[8] suggested the following data analysis procedures: (1) read the data several times, (2) develop an overall understanding, (3) describe the case(s) in detail and establish a context for them, (4) develop issues or themes about the case(s), and (5) consider a within-case analysis followed by a cross-case analysis when studying multiple cases. Creswell (2009) proposed a more precise data analysis model, as illustrated in Figure 2.

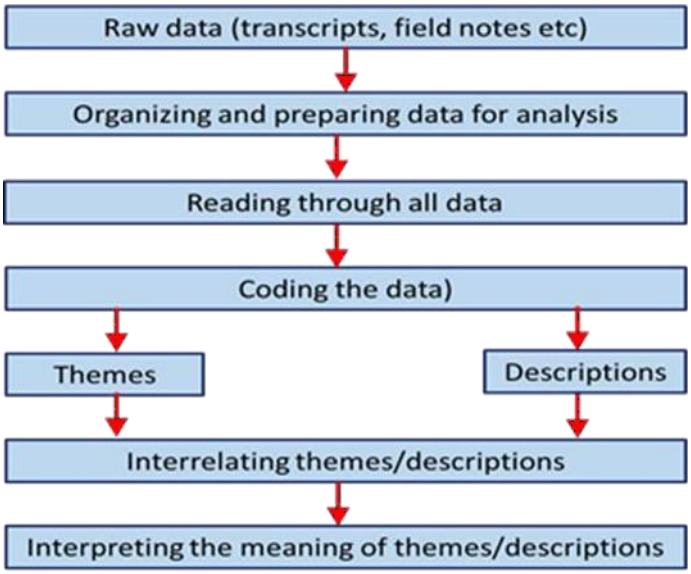

Figure 2: A proposed model of data analysis in qualitative research [9]

3. CONCLUSION

Students can gain a better understanding of theoretical concepts when games are employed in conjunction with standard lecture-based courses [2].This research aims to identify the features of games that have an effect on the learning of introductory calculus among pre-diploma students at a public university. The importance of the issue that is studied is to understand the learning ability of students in basic calculus. As such, this research report attempts to provide an approach for learning basic calculus that is meaningful, varied, and enjoyable. In addition, games enable teachers to gain a better understanding of their students' learning abilities in an inclusive education to enhance their teaching skills and competency. Finally, the review found that students' attitude towards a particular subject is important for learning success. Once students have confidence in their abilities, they will progress to a higher level with minimal guidance from the teachers, as what Vygotsky has termed as Zone of Proximal Development [10]

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THERMAL PHYSICS GAMES USING WORDWALL

Siti Nafisah Md Rashid[1], Nor Fadhlin Jaafar[1], Nurul Rashidah Syuhada Mohd Rais[1]

and Nur Fara Ellyana Ab Rahman[1]

[1]*Faculty of Applied Sciences, Universiti Teknologi MARA Cawangan Negeri Sembilan Kampus Kuala Pilah, Malaysia*

Corresponding author e-mail: nafisah@uitm.edu.my

ABSTRACT

Physics lecturers typically teach using the traditional method, in which they pose questions to the students in the class at each tutorial session and ask them to complete them in the allotted time. This method can cause students to become bored and disengaged in class. To address this issue, 39 pre-diploma in science students from groups PD0071A1 and PD0071B2 at UiTM Cawangan Negeri Sembilan, Kuala Pilah Campus were introduced to Wordwall, an online educational game. The activity consisted of a review of the topic thermal physics, with students required to answer 15 questions, with their scores displayed on the leaderboard after the session. The students' perceptions of their learning experience, motivation to learn Physics, and expectations were reflected by the ratings collected from their survey responses. According to the findings, 93.8% of students agreed that learning Physics through digital resources was interesting, and 81.3% preferred using Wordwall gamification tools in class over traditional methods. Furthermore, 75% of them agreed that using Wordwall as a teaching aid motivates them to understand the topic thermal physics and increases their engagement in the classroom since the implementation of open and distance (ODL) learning this semester. It makes the class more interactive and learning more enjoyable.

Keywords: Physics, pre-diploma, online game, engagement, learning

1. INTRODUCTION

In an era disrupted by the Covid-19 pandemic, the development of educational tools that are compatible with remote learning has become a critical approach, as millions of students practice social distance to keep the virus from spreading [1]. The situation has also posed a challenge to UiTM's education system, forcing lecturers to shift from traditional face-to-face classrooms to virtual learning. Previously, physics subjects were taught in a traditional way, with lecturers giving practice questions to students during tutorial sessions and discussion were carried out in class. The activities are not interactive, and students may find the physics subject tedious due to the theoretical and application concepts involved. Therefore, this may lead to poor engagement and poor performance towards learning physics under a flipped classroom.

The use of new technologies enables the teaching learning process to be more dynamic, interactive, contextualized and closer to students' reality [2]. According to Ferdiana (2020), various learning media implemented by lecturers during the pandemic increased the use of digital technology that is integrated into the entire student learning experience [3]. During the pandemic, it is expected that the use of various learning media will increase student motivation in meaningful teaching and learning, resulting in better learning outcomes. One method for ensuring that students understand lecture material is to use online media or e-learning-based media. There are some web tools that are frequently used by the lecturers such as Kahoot, Quizizz, Quizlet and others. The purpose of this study is to design and develop digital online games with gamification elements that will be used for physics revision, specifically in the topic Thermal Physics. Therefore, Wordwall was chosen for the purpose as it includes gamification elements such as a timer, score, and leaderboard. Furthermore, it is user-friendly because students can access the platform without having to sign up.

2. MATERIAL AND METHOD

Wordwall is a web-based educational game that is still infrequently used. This game can be accessed at any time and from any location using a laptop or smartphone. There are 18 game options available, including Match Up, Quiz, Wordsearch, Flip tiles, True or False, and many more. The templates are chosen based on the type of activity that the instructor wishes to create. In this study, the Game Show

Quiz template was used, which allows for the creation of a multiple-choice quiz with time constraints, lifelines, and a bonus round. Figure 1 shows the screenshots of the physics game shown on Word Wall.

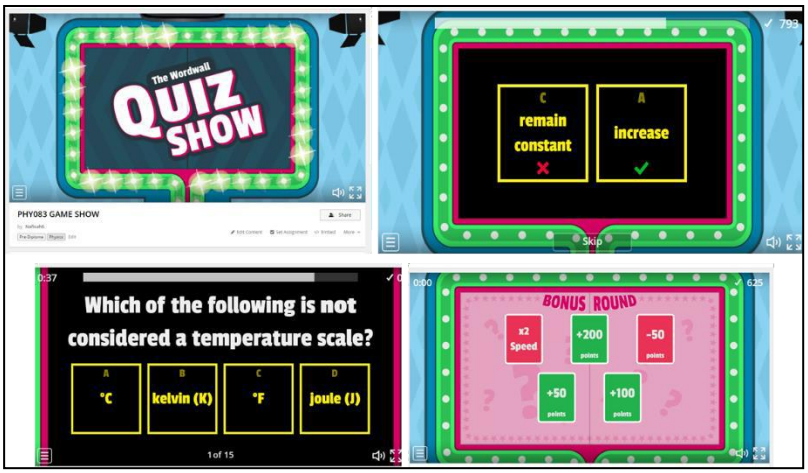

Figure 1: Screenshots of Physics Game Show on Word Wall.

The activity was carried out with the participation of 39 students from the Pre-diploma in Science programme at the Kuala Pilah campus, specifically from classes PD0071A1 and PD0071B2. Before the session began, the instructor used the Google Meet platform to give a briefing about the game and shared the Word Wall link with the students. The game was designed with 15 questions related to the topic of thermal physics, with 45 seconds allotted to answer each question. Students will be awarded extra points for each correct answer; however, if their answer is incorrect, the correct answer will be displayed immediately after the question concludes. After they have answered five questions, a bonus round will appear in which their luck will be tested. The student's performance will be visualized at the leaderboard score, which will rank the students based on their points. After the session, the students' perceptions of the learning experience, motivation, cognitive development, and expectations were analyzed using a survey form distributed to them.

3. RESULTS AND DISCUSSION

The survey was successfully completed by 32 pre-diploma in science students from groups PD0071A1 and PD0071B2 to investigate the efficacy of Wordwall as an alternative game-based platform for improving students' understanding of Thermal Physics. It was discovered that 62.5% of the students were female as opposed to male. The questionnaire was developed systematically in order to collect empirical data on the effectiveness of Wordwall as educational digital games in terms of perceptions and acceptance. All items in the questionnaire were measured using the Likert scale showing '1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree'.

A) Students' Learning Experience

Graphs on Figure 2 show the results of the students' responses to the learning using digital resources. Overall, 87.5% of respondents agreed and strongly agreed with the use of digital resources in learning

Physics, while 93.8% agreed and strongly agreed that using digital resources makes Physics more interesting.

B) Students' Motivation in Physics

According to Figure 3, 75% of respondents agreed and completely agreed that using Wordwall improved students' motivation, understanding of Thermal Physics topic, and desire to study. The use of educational digital games by lecturers during revision improves their engagement in study physics. To summarise student motivation for using Wordwall, according to Figure 3, 62.5% of respondents agreed and strongly agreed that answering questions on Wordwall was preferable to traditional tools such as books or paper.

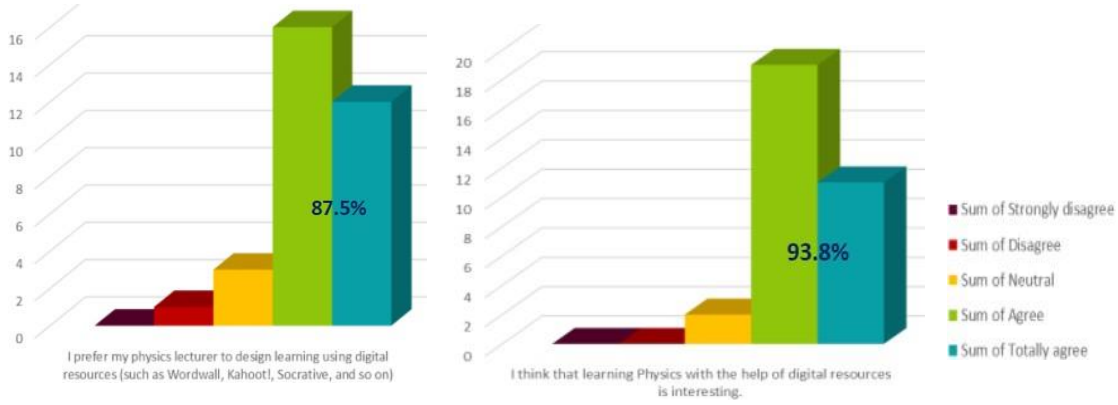

Figure 2 : Percentage of students' learning experience using Wordwall

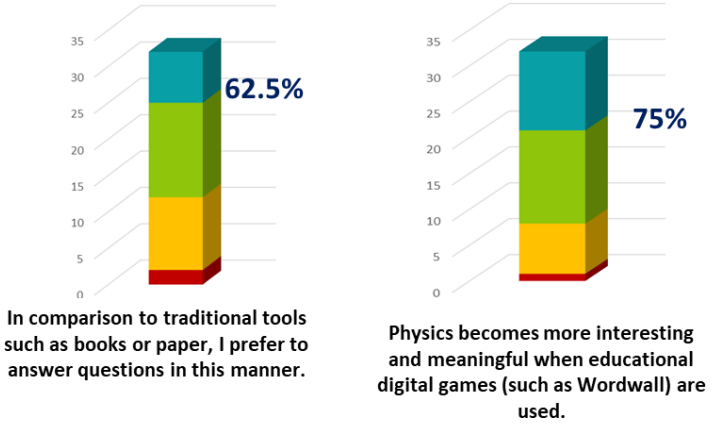

Figure 3 : Percentage of students who are motivated to study Physics after playing Wordwall educational digital games.

C) Students' Expectation of Using Wordwall

According to Figure 4, more than 80% of respondents expected to have more opportunities to learn using Wordwall in other classes as well. Furthermore, they preferred using Wordwall gamification tools in class over traditional methods because the Wordwall is easily accessible online to support teaching and learning activities

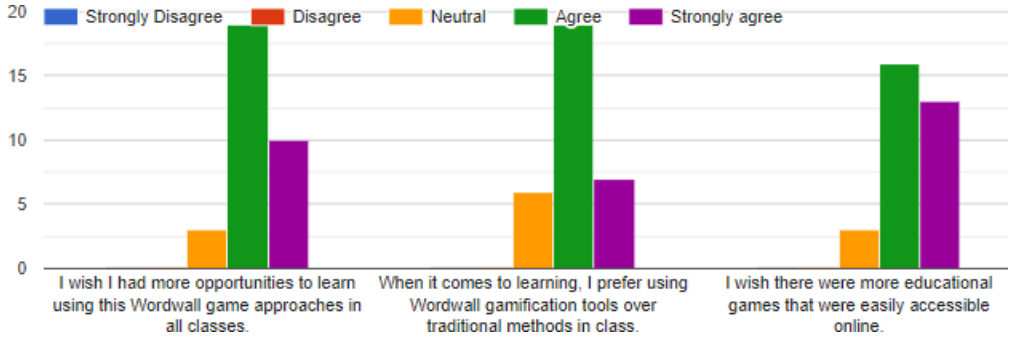

Figure 4 : Percentage of students' expectation towards Wordwall as teaching and learning aid.

4. CONCLUSION

Based on the findings, the study concludes that the majority of pre-diploma in science students strongly agreed with the effectiveness of Wordwall as an educational digital game in learning Thermal Physics. Students also believed that Wordwall could increase their motivation to learn Physics in general, which provides educators with insight into how to diversify their teaching and learning methodologies.

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GEOGRAM: LEARNING THROUGH PLAY

Nur Syahirah Mohd Mansor [1], Nur Aliah Syahirah Abd Ghofur [2], Sharifah Syazwani Syed Ahmad Za'im [3], Rafizah Kechil [4], Azlina Mohd Mydin [5]

[1,2,3]*Program Pra Pendidikan Tinggi (PPT), Universiti Teknologi MARA, Cawangan Pulau Pinang, Malaysia*
[4,5]*Jabatan Sains Komputer & Matematik (JSKM), Universiti Teknologi MARA, Cawangan Pulau Pinang, Malaysia*

Corresponding author's e-mail: rafizah025@uitm.edu.my

ABSTRACT

The mathematical study of shapes and space is known as geometry. In order to solve problems involving geometry, students should be able to know the formulas for the basic shapes and spaces. Problems with calculations will arise due to a lack of knowledge and awareness of skills in calculating and identifying basic geometry's formula. The purpose of this GeoGram is to provide an edutainment experience for students to review and improve their knowledge of basic geometry formulas. We want to make a game that will teach students simple and rapid self-learning tactics that they may use at any time. We used a PowerPoint spinning-wheel created by tekhnologic and a tangram created by mathigon as a game platform. We modified the spinning wheel by including a task for the player to perform. The geometry's formula is also visible near the spinning wheel. After spinning the wheel, the player must accomplish the objective of creating a diagram using the tangram platform by applying the formula provided. The use of GeoGram, which has an edutainment component, will aid students in improving their familiarity of geometry's formulas. GeoGram can be utilised in STEM programmes involving secondary school and higher education students. This is because they can see how mathematics is used in their lives and surroundings, and students' knowledge and enthusiasm in mathematic subjects will grow. This is due to the GeoGram's development considering learning theories, as well as an awareness of students' requirements and interests.

Keywords: Geometry's formula, edutainment, learning through play, self-learning.

1. INTRODUCTION

Students have a variety of misconceptions, a lack of prior knowledge and basic operation errors in the topic of geometry [1]. Learning geometry has become one of the most difficult subjects for students because it requires students to have strong cognitive abilities as well as spatial skills [2]. They are also weak in their understanding and applications of geometric concepts [3]. Thus, we created a product called GeoGram to assist students resolve this issue. The goal of this GeoGram is to give students an edutainment experience in which they can refresh and improve their basic geometry formula knowledge. We want to provide a game that teaches students quick and simple self-learning strategies that they may utilize at any time.

GeoGram is developed using PowerPoint software. It combines the use of spinning-wheels in PowerPoint created by technology [4] and tangram on mathigon's website [5]. The use of spinning wheels as a teaching aid is common. For example, [6] and [7] in their studies also used the spinning wheel as a teaching aid tool. [8] found that the spinning wheel that had been used as a tool was effective. They found that using Van Hiele learning theory and spinning wheel media could attract students' interest in the learning process, resulting in better conceptual understanding. The spinning wheel media could improve from the level of visualisation thinking to the level of analytical thinking in students.
The selection of a tangram in the development of GeoGram is because it is a STEM learning tool that helps children as young as pre-school, develop a variety of important STEM skills [9]. They can also

be used by teens. Tangram provides a simple concept with powerful brain growth benefits. Tangram assists students in developing problem-solving skills as well as geometrical concepts [10].

2. PRODUCT DEVELOPMENT

A PowerPoint spinning wheel produced by tekhnologic and a tangram created by mathigon were utilised to create a game platform. We modified the spinning-wheel by displaying the basic geometry formula on the spinning-wheel. Figure 1 shows the process of development of the GeoGram. We blended the basic geometry formula, the PowerPoint spinning-wheel and the tangram together.

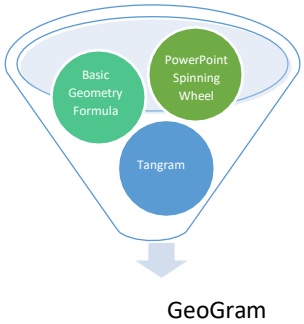

Figure 1: The Process of development of the GeoGram

3. PRODUCT DESCRIPTION

The formulas for geometry are shown near the spinning wheel. After spinning the wheel, players must use the formula provided to complete the goal of building a shape utilising the tangram platform. Figure 2 shows the user manual of the GoeGram. Players can refer to the steps that mentioned in this user manual before they proceed with the game.

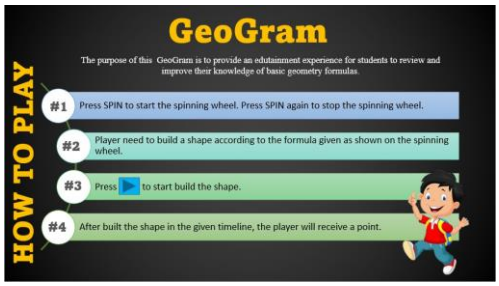

Figure 2: User Manual of the GeoGram

As shown in Figure 3, the basic geometry formula can also be seen near the spinning wheel. It will help players to remember the basic geometry formula. After spinning the spinning-wheel, players must construct a shape using the number of shapes and formulas specified on the spinning-wheel. If players are unable to identify the formulas, they can refer to a list of formulas displayed on the same screen.

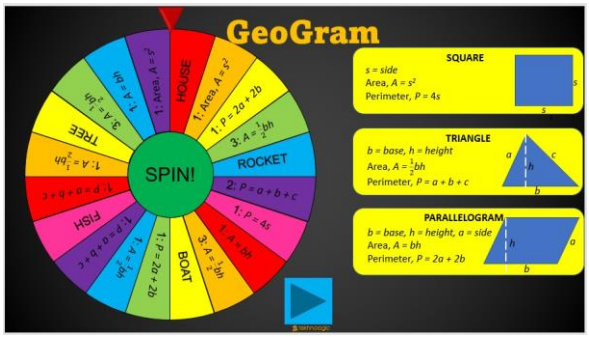

Figure 3: Spinning-Wheel of the GeoGram

To reach the tangram website, players must press the play button. Figure 4 shows the Mathigon Website, the platform to play the tangram in online mode.

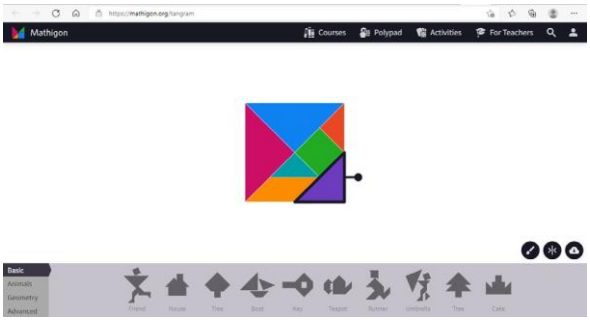

Figure 4: Mathigon Website

For example, if the spinning-wheel lands on a house plot, players are suspected of constructing the house's shape using one square, three triangular and one parallelogram, as shown in Figure 5.

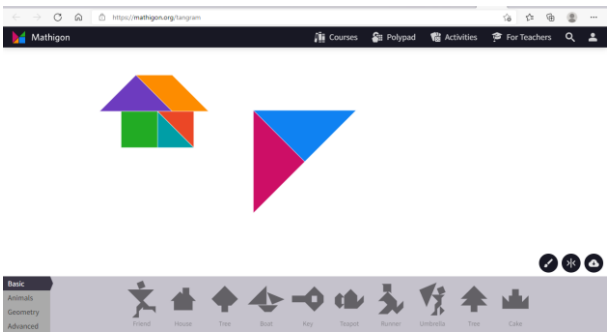

Figure 5: The Development a House using One Square, Three Triangular and One Parallelogram

4. NOVELTY AND UNIQUENESS

GeoGram includes an edutainment element, which is learning through play. Students' knowledge of basic geometry formulas and creativity in building a two-dimensional shape are blended in GeoGram. The combination of games encourages students to complete the overcoming challenge to improve their performance in the activities, making learning more enjoyable. Students appreciate completing the game since it allows them to work out their creativity.

5. PRODUCT SATISFACTION

A total of 25 people were chosen and participated in this study. According to the results of the pre-test and post-test as shown in Figure 6, students are better able to solve basic geometry applications after being introduced to the GeoGram.

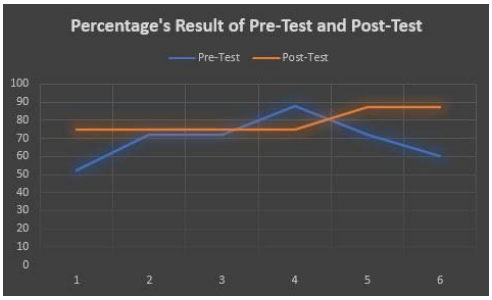

Figure 6: Percentage's Result of Pre-Test and Post-Test

6. BENEFIT TO MANKIND

Students will benefit from using GeoGram, which has an edutainment component. GeoGram helps to improve their understanding and ability to remember basic geometry formulas. Students' understanding and interest in mathematical subjects will grow as they see how mathematics is employed in their daily lives and surroundings.

7. POTENTIAL COMMERCIALIZATION

GeoGram can be used in STEM programmes involving students in secondary and higher education. STEM is important because it instills a love of innovation and teaches critical thinking skills. STEM education teaches students how to solve problems through critical thinking. Students learn how to examine problems and then devise solutions by participating in STEM learning experiences [11].

8. CONCLUSION

Learning through play helps students to improve their performances and this will make the learning more fun. They also enjoy completing the task because they can polish their creativity. GeoGram will sharpen students' skill in memorizing the basic geometry formula. This result aligns with the research done by [12]. They found that the students in the experimental group had developed a better attitude toward geometry.

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CROSS-SPELLBOUND

Siti Zarikh Sofiah Abu Bakar[1], Nabil Syakir Zin Khami[2], Roshiqal Roslan[3], Sahil Sulaiman[4], Mohd Akmal Faiz Mohd Johari[5]

[1]Academy of Language Studies, Universiti Teknologi MARA (UiTM) Cawangan Johor, Malaysia [2,3,4,5] Pra Pendidikan Tinggi, Universiti Teknologi MARA (UiTM) Cawangan Johor, Malaysia

Corresponding author e-mail:
sitiz148@uitm.edu.my

ABSTRACT

Spelling is the sacred pillar of all words. Misspelled words are calamitous. Cross-Spellbound is a gold mine to enhance ESL students' skill in identifying and practicing the correct spelling for common misspelled English words. In a form of crossword puzzles, the students will be able to enjoy the extraordinarily amusing experience in trying to get the correct spelling for all words based on the clues provided. Adding to the fun, the students will be challenged by three difficulty levels namely warrior (easy), elite(intermediate), and master(hard). They should also complete each level within the stipulated time. Acing each level will definitely boost their confidence in using the English words, especially in academic writing purposes. Other than that, as students all around the globe are also challenged by the unwelcomed arrival of Covid-19 pandemic, this educational game should be beneficial in reducing their stress while gaining precious English spelling knowledge. Besides, since Open and Distance Learning (ODL) requires a more independent and student-centered learning process, Cross-Spellbound is one of the best wagons to jump on. Cross-Spellbound further serves its novelty by providing complete instructions to guide the potential players. While online games are taking the limelight in most educational areas, printed materials should not be left out as the experience from the sense of touch activities as scratching the words on paper could be one of the best spells to charm an individual.

Keywords: spelling, ESL students, common misspelled English words, Open and Distance Learning (ODL), educational games

1. INTRODUCTION

One of the challenges for second language learners is to spell the new words correctly. Likewise, for English, the second language learners (ESL students/learners), they are prone to be influenced by the rules of their mother tongue, hence the misspelled words. They are also bound to spell the words based on their registered sounds. Once the word is mispronounced, the incorrect spelling will be generated. As quoted by Mohd Samuddin and Krish (2018), in Botley, Hakim and Dillah (2007), ESL learners tend to choose the wrong grapheme to represent the sound of the words as a result of mispronunciation.

Malaysian students who learn English in school fall under the same category of second language learners, therefore, they are also bound to commit spelling errors. With the emergence of various social network services, these ESL learners have more platforms to practise the second language; spoken or written. According to Yunus et al., (2019), social network service motivates students to engage in their English language learning as well as encourage them to improve their writing.

Even though this could be a good sign for their second language learning process, it could be defeated if they do not pay attention to the correct spelling of words. A research by Nazman, Ting and Chuah (2021), highlights that social media users believe that the use of non-standard spelling is normal in social media context as it saves time and eases their typing effort. Unfortunately, this situation could be a contagious virus to the ESL learners who might believe that the published spelling on social media is the correct form to be used.

In brief, Cross-Spellbound wishes to familiarise ESL learners with the commonly misspelled English words by providing both the wrong and correct spelling in one amusing educational game; this has proven a great boost in mastering English vocabulary by using crossword puzzles as the main activity.

2. MATERIAL AND METHOD

A. Cross-Spellbound: Materials

Cross-Spellbound was created using the most user-friendly application, Microsoft Word and Portable Document Format (PDF). These applications were chosen since this project aims to provide fun and easy English educational game experience for the players. Besides, the application formats used let the players decide whether to play the game using the soft copy or the hard copy.

B. Cross-Spellbound: Content

Cross-Spellbound comprises three modes with three difficulty levels namely warrior, elite, master. There will be three sets of crossword puzzles for each level. The players are expected to complete each set and level within the stipulated time.

C. Cross-Spellbound: Method

Cross-Spellbound can be played either by an individual, in pair, or in group.

Mode: Individual
Step 1: Set the mode (individual)
Step 2: Choose the difficulty level (starts with warrior – elite - master)
Step 3: Set the stopwatch:
Warrior = 10 minutes for each set.
Elite = 15 minutes for each set.
Master = 20 minutes for each set.
Step 4: Play the game till the end.
Step 5: Get the answer key to check and score yourself.

Mode: Pair
Step 1: Set the mode (pair)
Step 2: Choose the difficulty level (starts with warrior – elite - master)
Step 3: Set the stopwatch:
Warrior = 10 minutes for each set.
Elite = 15 minutes for each set.
Master = 20 minutes for each set.
Step 4: Play the game till the end.
Step 5: Get the answer key to check and score yourself.

**If one of the players could not complete any set within the stipulated time, he/she will be eliminated from the game and the remaining player will be declared as the winner.*
***If no player is eliminated, the player with the most correct answers will be declared as the winner.*

Mode: Group
Step 1: Set the mode (Group)
Step 2: Choose the difficulty level (starts with warrior – elite - master)
Step 3: Set the stopwatch:
Warrior = 10 minutes for each set.
Elite = 15 minutes for each set.
Master = 20 minutes for each set.
Step 4: Play the game till the end.
Step 5: Get the answer key to check and score yourself.

**If one of the players could not complete any set within the stipulated time, he/she will be eliminated from the game and the remaining player will be declared as the winner.*
***Group with more remaining player(s) will be declared as the winner.*

3. RESULTS AND DISCUSSION

Cross-Spellbound was played by its first 30 players and their feedbacks are shared in the following figures;

3.1 Students' Feedbacks on Cross-Spellbound

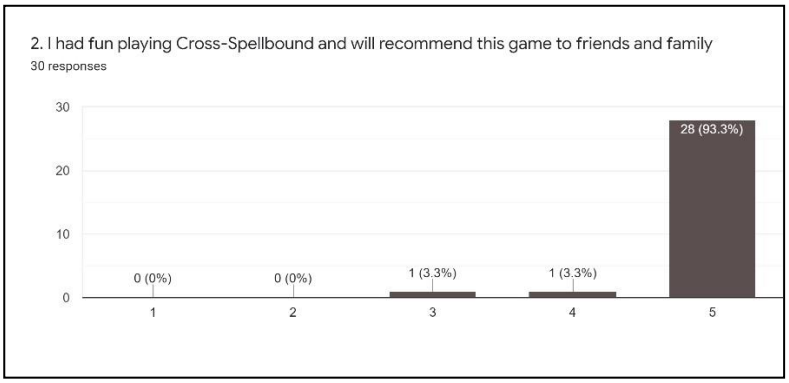

Figure 1: Students' Feedback on their Excitement in Playing Cross-Spellbound

Based on Figure 1, 93.3% of the students strongly agreed that Cross-Spellbound offers them an amusing experience and they will definitely recommend the game to their friends and family.

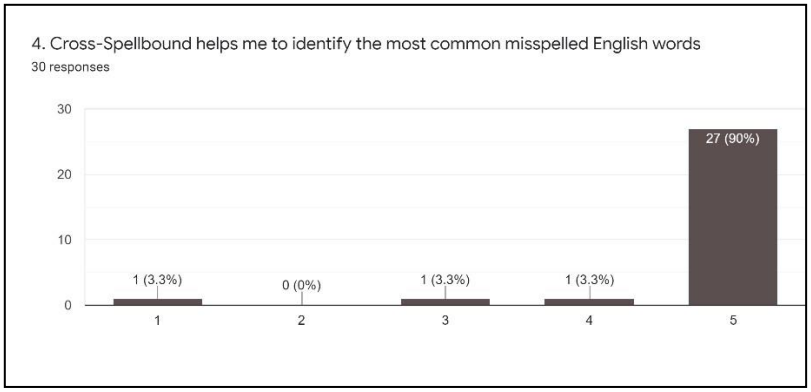

Figure 2: Students' Feedback on their Experience in Playing Cross-Spellbound

Figure 2 reveals that 90% of the respondents strongly agreed that Cross-Spellbound helps them in identifying the most common misspelled English words.

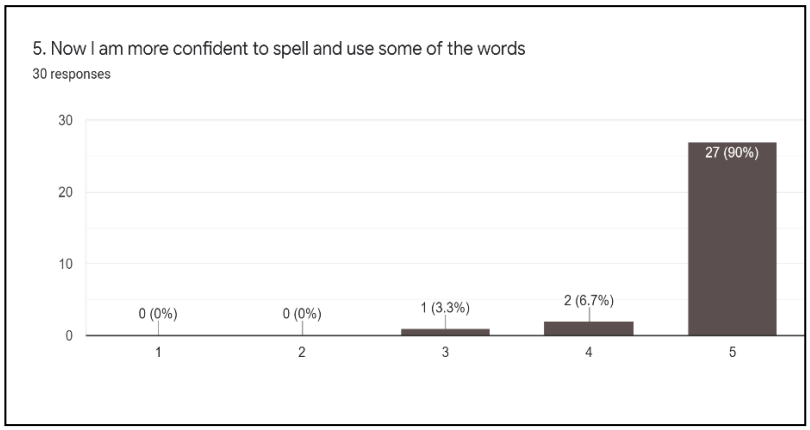

Figure 3: Students' Feedback on their Spelling Confidence after Playing Cross-Spellbound

Referring to Figure 3, the majority of the respondents (90%) strongly agreed that Cross-Spellbound has boosted their confidence in spelling and using some of the words included in the game.

In brief, positive feedback gathered by the project has proven its high potential for commercialisation as well as accompanying other existing educational games. While online games are taking the limelight in most educational areas, printed materials should not be left out as the experience from the sense of touch activities as scratching the words on paper could be one of the best spells to charm an individual. As suggested by Lee (2020), students who learn English as their foreign language believe that printed materials are more effective for learning English compared to digital materials.

4. CONCLUSION

Cross-Spellbound has successfully met its players in its own exciting and beneficial ways, and is hoped to meet more players in future. This educational game is worth playing as it can be played offline, using the soft copy or the hard copy. Other than that, players have full-control on how to play the game except for the restricted instructions accompanied as to increase the challenge. Cross-Spellbound wishes to help ESL learners in spelling as well as their English writing journey. As mentioned by Saeed Al Sobhi (2017), spelling needs to be given more attention even though some might regard it as trivial, as it could lead to greater problems in English writing.

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A-MAZE-ING PHYSICS

N. Makhtar[1], S.Z. Abdullah[1], N. N. K. Aminy[1], S. A. M. Puad[1]

[1]*Faculty of Applied Sciences, Universiti Teknologi MARA Caw. Negeri Sembilan, Kampus Kuala Pilah, Malaysia*
Corresponding author e-mail: nurulizzati@uitm.edu.my

ABSTRACT

Kinematics is one of the topics in physics that describes the motion of objects. Most of the students are getting confused to solve the problems of this topic since there are many considerations to take off before choosing and applying the equations. Creating game-based learning regarding this topic is a useful way to help the students understand this topic. This way is not just improving students' ability but allows the students to engage with educational materials playfully and dynamically. A-maze-ing Physics is game-based learning that uses Wordwall as a platform to create learning activities. This platform has fully customizable activities such as quizzes, word games, maze chases that can be used by the educator as an alternative way to review the students' understanding with a quick revision. In this study, about 43 of the respondents from Pre-Science students have been selected to try the A-mazing-ing Physics game, and they have to give feedback on the game in a given survey form. Based on the feedback, the analysis showed that all the respondents agree that A-mazing-ing Physics is not just game based learning that helps them to more understanding about the kinematics but also attracts them to learn physics interactively.

Keywords: kinematics, Wordwall, physics, maze chase

1. INTRODUCTION

Saying the word physics makes students feel afraid to listen to it. This is because their minds have been stuck on the fact that the subject of physics is the most difficult in the world. Therefore, educators who teach this subject need to find effective ideas or ways to re-cultivate students' interest in learning this subject. The use of the game in teaching and learning has become an option among educators. Gamification in learning is just not an attractive concept, but it also promotes motivation [1] and engagement to the learners [2][3].

Kinematics is one of the topics that students always lack understanding. This is because students are confused with the use of formulas and selections in solving questions involving this topic. The purpose of this study is to build a practical educational game that would assist students in mastering concept kinematics, to provide an alternative platform for students to review their learning and conduct a short revision, to encourage educators to incorporate technology into the teaching and learning process and to investigate the efficiency of revision games based on educational games regarding student motivation.

2. MATERIAL AND METHOD

The study was conducted on the Pre-Science students who enrolled in the Fundamental Physics courses at UiTM Negeri Sembilan, Kuala Pilah Campus. From previous experience, Pre-Diploma Science students have difficulty understanding and applying the concepts of Kinematics when only using a lecture-based approach of teaching. Hence, the ADDIE model was used as a guideline for designing the revision. A-maze-ing Physics was designed as a tool for revision activities, and Wordwall was used as a platform to create interesting activities such as quizzes, word games, maze chases, and random wheels. A total of 43 respondents were given a try to answer A-maze-ing Physics to see the effectiveness of this tool during learning and teaching. Besides that, this was a survey study to identify students' problems in understanding the idea of kinematics.

3. RESULTS AND DISCUSSION

Among the questions asked in the survey are regarding the student's preferred learning style, as shown in Figure 1. The results show that about 65.1% of respondents prefer learning physics face-to-face (F2F) when before the pandemic. However, during the pandemic, most of the respondents (30.2%) preferred online classes, followed by hybrid classes (27.9%) and blended learning (23.3%) instead of face-to face (18.6%).

Figure 2 shows types of game activities that can be played in A-maze-ing Physics, and results show the most interested of respondents to answer is Maze Chase (51.2%). This result was supported by the data in Figure 3 which are among the reasons respondents were interested in Maze Chase. Almost all respondents are interested in answering A-maze-ing Physics because it makes them more competitive, makes them more active in learning, can reduce boredom and burning, and is colorful and interesting.

Overall, Figure 4 shows the student's perception in answering A-maze-ing Physics. About 22 respondents (51.2%) strongly agree physics lessons using educational digital games like A-maze-ing Physics give a lot of benefits especially to improve their understanding. Furthermore, most of the respondents (58.1%) strongly agree that they are very interested in using games for learning physics in the future.

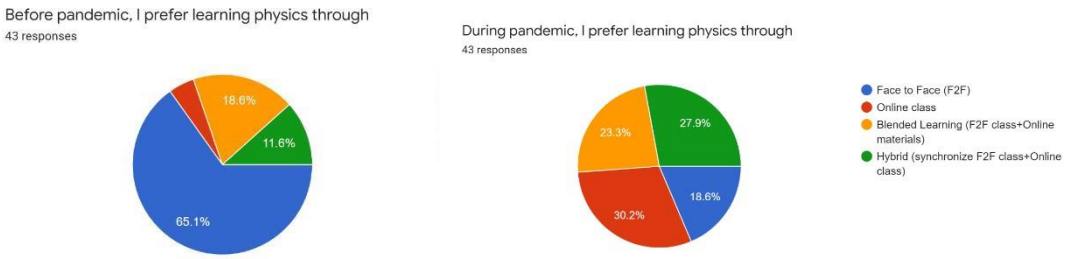

Figure 1: Preferable of students learning physics before and during the pandemic

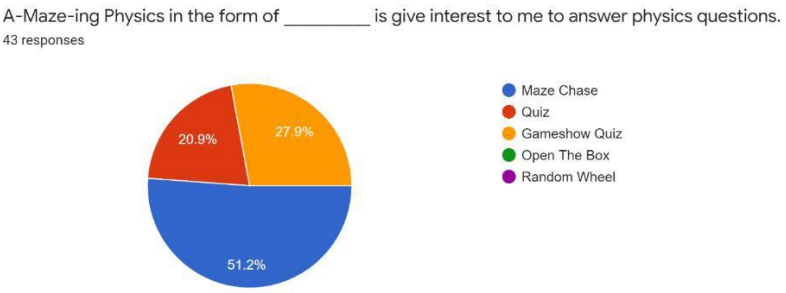

Figure 2: Preferable of students answer A-maze-ing Physics form activities

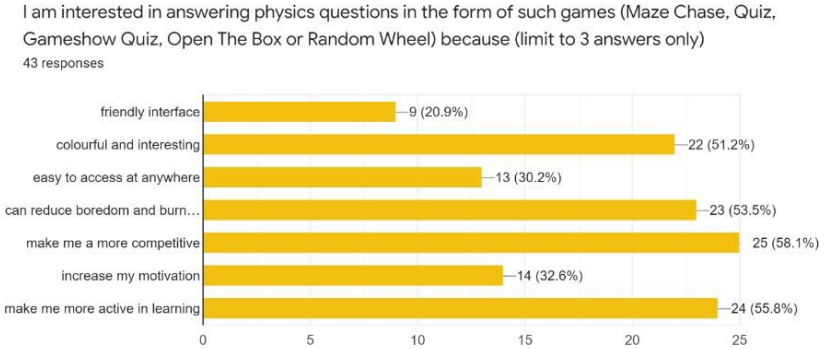

Figure 3: Reasons of students answering A-maze-ing Physics

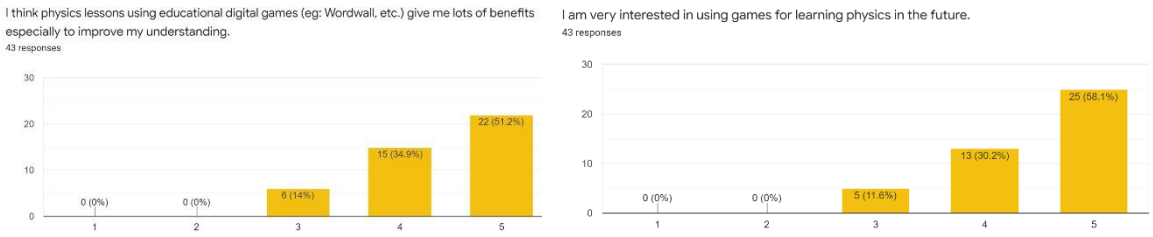

Figure 4: Perceptions of students answering A-maze-ing Physics

4. CONCLUSION

In conclusion, A-maze-ing Physics is one of the educational games which appropriately uses an alternative way of teaching learning online. It can also provide an understanding related to kinematics and indirectly attract students to learn physics subjects.

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ONLINE TEACHING LEARNING STRATEGIES

AGR042 SMART CLASSKIT

Rozlianah Fitri Said[1], Nur Aziemah Jasni[1], Devlon Deannie Jonaile[1], Ahmad Aiman Jafrid[1], Mohamad Azri Abadi Ismail[1]

[1]*Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus, Malaysia*
Corresponding author e-mail: rozli222@uitm.edu.my

ABSTRACT

The COVID-19 has caused school closures worldwide, and education has changed dramatically. The demand for online learning has risen significantly, and it will continue to do so in the future. Currently, teaching is done remotely and on digital platforms. Online learning necessitates that teachers have a basic understanding of using digital forms of learning. However, this is not always the case. Untrained educators usually use online learning to share notes rather than implement interactive learning that promotes active learning in the virtual classroom. Therefore, students tend to lose interest in learning through online platforms. Therefore, this innovation was designed to be an interactive and collaborative e-learning platform that would engage both students and lecturers. Padlet and Edmodo were used in this study. These education technologies provide cloud-based software as a service, hosting a real-time collaborative web platform. Students can easily click on any links provided in the AGR042 Smart ClassKit on Padlet to view the learning materials and activities, even if it has been a few months' post on Edmodo. Moreover, AGR042 Smart ClassKit is protected with a password. Only the students with a registered Edmodo account can access this platform to ensure they are in a secure online learning environment. This innovation has facilitated the online learning process by focusing on interactive and collaborative learning in a safe online environment, thus attracting students' interest.

Keywords: online learning, interactive, Edmodo, Padlet, learning management system.

1. INTRODUCTION

In March 2020, the World Health Organization [1] declared Covid-19 a pandemic that posed a current threat to humanity. This pandemic successfully shut down educational activities globally, resulting in the migration of universities from face to face traditional teaching to online learning as an educational platform. Online learning is the process of utilising the internet and other significant technologies to create materials for educational purposes, instructional delivery, and programme management [2]. Online education has regularly been viewed from the perspective of a good-to-have alternative but not a serious-mission model to guarantee the steadiness of instructional activities [3]. There is still a reluctance to understand and take advantage of the opportunities to move to a digital environment. Hence, impact the educators' and students' performance in teaching and learning. Digitalization is a necessity in higher education institutions (HEIs) capable of creating a learning community and building an inclusive environment that enhances students' engagement, improving the experience of courses, teaching materials, and the overall training process [4]. To be effective and efficient with online learning, educators must implement an interactive and collaborative learning environment that promotes active learning and a thorough understanding of the benefits and limitations of using educational technology tools. Online education is convenient for students, where they can access online materials anytime and anywhere. Active online learning entails going beyond the passive one-way of online learning. This innovation aims to organise the e-learning content effectively with the integration of Padlet and Edmodo for the students to maximise the online learning experience.

2. MATERIAL AND METHOD

The Pre-Diploma in Agrotechnology students of UiTM Sabah Branch registered for Basic Agrotechnology (AGR042) were invited to the virtual classroom via a link created using Buncee that leads the student to a Learning Management System (LMS) on Edmodo. A fascinating introductory video clip was used to capture students' attention at the start of the course. Edmodo and Padlet can be accessed via mobile phone, tablet and desktop. Students created their free accounts for Edmodo and Padlet and updated their profiles. Then, they were briefed on how to use Edmodo and Padlet which was conducted via Google Meet to ensure that they fully benefited from these education technologies. Lectures, assessments and fieldwork for students to update their activities were conducted via Edmodo since the beginning of the October 2021 – February 2022 semester. Small groups were created in the AGR042 virtual classroom to assist the students during lectures and fieldwork. AGR042 Smart Class Kit was developed on Padlet and integrated with exclusive links to Edmodo virtual classrooms.

3. RESULTS AND DISCUSSION

3.1AGR042 Smart ClassKit

AGR042 Smart ClassKit was developed on Padlet and integrated with exclusive links to the Edmodo virtual classroom (Figure 1). It is protected with a password to ensure the safety of the online learning environment. Only the students with a registered Edmodo account and who have enrolled on the AGR042 virtual classroom can access this platform (Figure 2). Students can easily click on any links provided in the AGR042 Smart ClassKit to view the learning materials and activities, even if it has been a few months' posts on Edmodo. Students were prompted to the previous conversation of any topics discussed in Edmodo with only one click on the links provided in AGR042 Smart ClassKit. They were also on track and never missed the due dates of assignments, staying alert on the dates of the tests or final exam. Apart from that, both lecturer and students received notifications for all posts on Edmodo or Padlet. Asynchronous modes of online learning suit students to access online material whenever they need [5]. Edmodo, as one of the global education networks, provides a robust LMS platform that benefits their users across the world

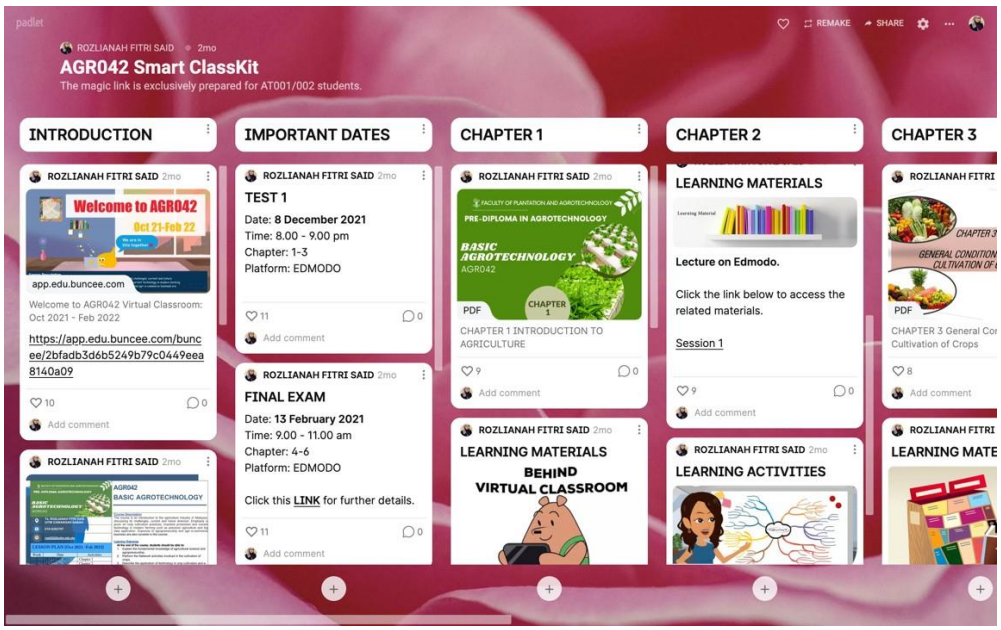

Figure 1: AGR042 Smart ClassKit.

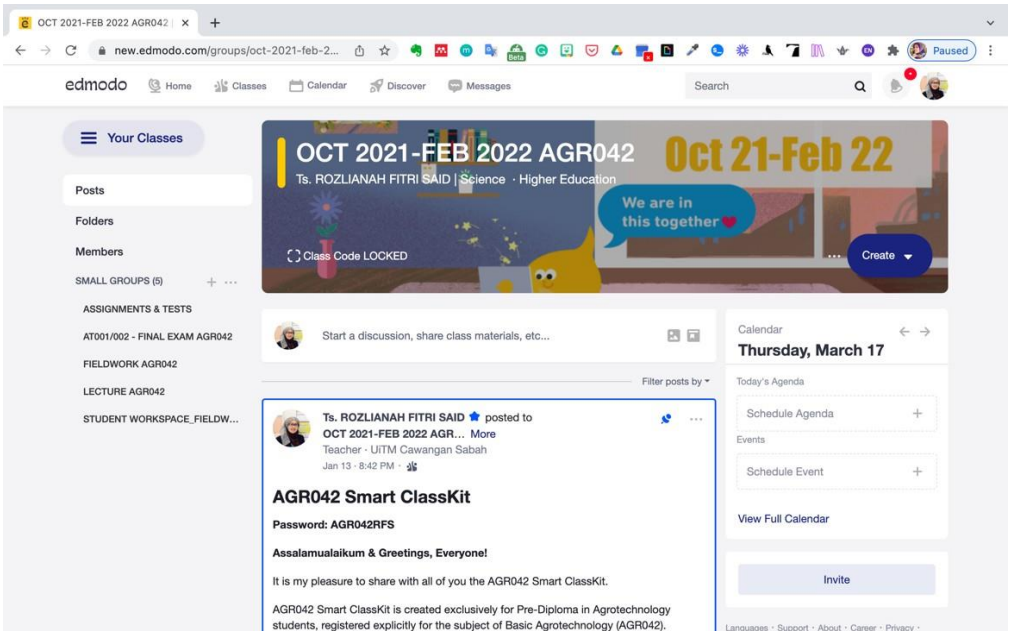

Figure 2: AGR042 Virtual Classroom on Edmodo.

3.2Student Reflection

The student feedback was measured through conversation sessions elicited via Google Meet. The discussion session via Google Meet shows that students become more excited and confident in learning the AGR042 course.

> "AGR042 Smart ClassKit has helped to ease our study, especially to recall the previous notes and discussion of a specific topic."

> "We stay alert on the due date of assignments, tests and exams."

> "We are so grateful to have the AGR042 Smart ClassKit magic link. It is available whenever and wherever we need it."

Online education turns education into student-centered, where students participate in the learning process, and teachers work as supervisors and guides for students [6]. The change to online in higher education entails reshaping our view regarding higher education, including institutions and students' needs.

4. CONCLUSION

This innovation enhances the quality of education where it improves the online teaching and learning environment. The students can refer to the valuable resources that were shared via AGR042 Smart ClassKit at any time to recall things they have learned, thus improving knowledge retention and transfer. Moreover, the system applied in developing AGR042 Smart ClassKit can be used for any e-learning content of academic or training courses, whether free or paid courses. It gives benefits to the trainers/educators as well as participants/students with effective, interactive and collaborative online learning.

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CREATIVE VIDEO COMPETITION: A NEW APPROACH IN NURTURING NATIONAL IDENTITY AND CITIZENSHIP AMONG PRE-DIPLOMA STUDENTS

Noraini Ismail[1], Siti Hanisah Sabri[2], Muhammad Danish Amin Iswadi Efendi[3], Muhammad Afis Firdaus Mohamad Razali[4]

[1-4]*Academy of Contemporary Islamic Studies (ACIS), Universiti Teknologi MARA Cawangan Perlis, Kampus Arau, Malaysia*

Corresponding author e-mail: noraini045@uitm.edu.my

ABSTRACT

The creative video competition is a teaching and learning initiative for the Introduction to Human Development Course (CTU001) in UiTM Perlis and it was implemented during the pandemic via an online platform. It aims to cultivate the values and identity of citizenship which is one of the important topics in the CTU001 course. Based on the old method, learning was through lectures in class and the assignments were assigned in written forms. With this competition, students do not have to be in class all the time but they have to prepare a video according to the theme that has been set in groups. Students are free to be creative and to present information through videos in front of eight jurors. This competition has successfully improved students' soft skills and knowledge. The findings of the survey showed that the students can understand well the values and identity of citizenship as well as they manage to cultivate good values in ensuring that the tasks given were implemented successfully. This competition program needs to be continued as an added value of teaching and learning in the CTU001 course especially during the implementation of Open Distance Learning (ODL).

Keywords: video competition, creative video, teaching and learning strategy, national identity, pre-diploma

1. INTRODUCTION

Online learning is one of the best alternatives especially during the COVID-19 pandemic phase and among the effective e-learning mediums is video-based learning. According to Widahyu (2021), video can show things that cannot be brought into the classroom and it is an appropriate and accurate medium to convey a message and it helps students to understand better. In addition, it can cultivate interest and it generates motivation to the students to always pay attention to class' lessons (Kamlin & Keong, 2020). For instance, video clips can give an overview of the course of history and students can understand history effectively through selected audio and visuals (Ni et al., 2019). Moreover, according to the study of Wan Jusoh et al. (2019), the use of videos and padlets also increased the learning effectiveness of Islamic Civilization Course. Similarly, the production of animated videos can increase students' creativity and give students the freedom to express their feelings and thoughts on an issue (Jamil, 2021). The use of video tutorials is also an effective method to replace face-to-face classes and provide good and clear guidance to students (Mardikaningrum & Supriyadi, 2018). A study by Wong (2020) also showed that learning through video is considered effective by postgraduate and undergraduate students.

Previous studies show various positive impacts of video-based learning. Therefore, a video competition was held for the Introduction to Human Development (CTU001) course at UiTM Perlis Branch to enhance students' skills and knowledge especially about national identity and citizenship. Previously, students learned the topic of values and identity of citizenship through lectures and tutorials in class as a way to increase their learning impacts, however, during the pandemic phase a video competition themed 'Islamic Approach in Nurturing National Identity and Sense of Citizenship' was held to replace the former method. All students of the CTU001 course were divided into several groups and they were

instructed to prepare videos according to different given themes. In addition, they were also given a specific format as well as a scoring rubric. A total of eight jurors were involved in the evaluation and it was done virtually through Google Meet as a medium. UiTM Perlis Branch has provided cash prizes to the group of students who won first, second and third place. Certificates of appreciation and certificates of participation were given to all involved. A study to review the perception of the students and the effectiveness of this video competition program was conducted. This article discusses the findings of the study.

2. MATERIAL AND METHOD

The ADDIE model which consists of five phases (analyse, design, develop, implement, evaluate) has been used for the development, implementation and evaluation of creative video competition programs. In the analysis phase, a literature review and document analysis were conducted to look at past studies related to video-based learning, implementation methods, judging and others related to the competition. Next, designing and developing the theme and the tentative for the implementation of a creative video competition as well as the appointment of committees and juries. After that, the creative video competition was implemented according to the tentative. Then in the evaluation phase, a survey study on the perception and effectiveness of the creative video competition program was conducted. A five Likert scale questionnaire was distributed to 30 students.

3. RESULTS AND DISCUSSION

3.1STUDENTS PERCEPTION TOWARDS CREATIVE VIDEO COMPETITION

Table 1: Perception Towards Creative Video Competition

Items	Mean	Standard Deviation	Interpretation Level
The task of producing a video enhance students' interest in learning	4.06	.58	High
The task of producing a video improve students' knowledge related to the latest technology	4.36	.66	High
The task of producing a video fosters a spirit of teamwork	4.13	.50	High
The task of producing a video builds students' soft skill	4.10	.66	High
The task of producing a video helps students appreciate what they are learning	4.06	.58	High
The task of producing a video gives students the opportunity to spread the noble values of citizenship through new media	4.23	.56	High
I support the use of video competition as a teaching and learning method to disseminate the pure values of citizenship	4.30	.59	High
Total Mean	**4.18**	**0.59**	**High**

Table 1 shows that all students had a positive perception of creative video competitions with the total mean score being at a high level (M = 4.18, SD = 0.59, n = 30). All items showed a high mean score between 4.06 to 4.36. The highest mean score was 4.36 where students agreed that video production enhance knowledge related to the latest technology. The students also agreed that producing a video gives them the opportunity to spread the noble values of citizenship through new media and they support the use of video competition as a teaching and learning method to disseminate the pure values of citizenship.

3.2EFFECTIVENESS OF THE CREATIVE VIDEO COMPETITION

Table 2: Effectiveness of the creative video competition

Items	Mean	Standard Deviation	Interpretation Level
I understand more about the values of citizenship when producing videos for the competition	4.00	.74	High
I love working in groups through video competition assignments	4.13	.50	High
All members of my group cooperated well in producing the video for competition	4.10	.66	High
I became a more creative person through the task of producing videos	4.23	.56	High
I was able to work in groups while performing video production tasks	4.30	.59	High
I managed to form a good relationship with the group members while producing the video	4.20	.61	High
I suggest the task of preparing videos for competition should be continued for students CTU001 course	4.06	.58	High
Total Mean	**4.14**	**0.60**	**High**

Findings in Table 2 show that creative video competitions have a positive effect and improve students' civic knowledge and skills with an average mean score at a high level (M = 4.14, SD = 0.60, n = 30). The whole item showed an average mean score at a high level between 4.00 to 4.30. The highest mean score was 4.30 where students agreed that they could work in groups in video production. Students also agreed they better understood the value and identity of citizenship through this assignment and agreed the program should be continued in the future.

4. CONCLUSION

Findings from the literature review and survey study clearly show that the implementation of creative video competitions especially in the pandemic phase can achieve the teaching and learning objectives for the Introduction to Human Development (CTU001) course. The objectives of the competition which focused on cultivating the values and identity of citizenship were also successfully achieved where the mean score for perception and effectiveness was at a high level. Students also agreed that this competition should be continued in the future. It is believed that this competition does not only facilitate online teaching and learning but it also can improve soft skills and the use of the latest technology among students has also yielded good effects to the students' developments and understanding. It turns out that teaching and learning through creative video competition is more effective and interactive in line with the new millennium education.

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ACADEMIC POSTER COMPETITION: A NEW APPROACH IN TEACHING AND LEARNING STRATEGY FOR INTRODUCTION TO HUMAN DEVELOPMENT COURSE

Noraini Ismail[1], Nor Iman Nabila Abu Bakar[2], Muhammad Danish Amin Iswadi Efendi[3], Muhammad Afis Firdaus Mohamad Razali[4]
[1-4]*Academy of Contemporary Islamic Studies (ACIS), Universiti Teknologi MARA Cawangan Perlis, Kampus Arau, Malaysia*
Corresponding author e-mail: noraini045@uitm.edu.my

ABSTRACT

The COVID-19 pandemic forced all parties to optimize the use of online learning as a medium of teaching and learning. Different strategies have been implemented to improve learning outcomes. Therefore, academic poster competition was adopted into Human Development (CTU001) course as an effective mechanism in order to enhance the learning outcomes. As compared to the traditional method, students were only following the learning in classroom and complete written assignments but through the academic poster competition, students are given the opportunity to work in groups to produce posters as an added value to the knowledge gained during lecture sessions in class. It is more interactive, tests the mind, and can hone students' creativity. The findings of the study show that students are very positive about the implementation of the program and want it to continue again in the future. The implementation of the program has a positive effect on the improvement of students' knowledge and soft skills. Therefore, this program needs to be further developed with various methods in sustaining active learning to meet the challenges of 21st-century education.

Keywords: poster competition, academic poster, teaching and learning strategy, human development course

1. INTRODUCTION

Poster presentation or poster competition is one of the active learning strategies in teaching and learning strategies. Students are able to comprehend learning way better when they actively participate in the process as compared to conventional methods. The poster presentation is an active and cooperative learning approach that creates a better and more enjoyable learning environment (Demerci & Coskun, 2021). The poster competition is not just a program or competition, but it also gives participants the opportunity to improve soft skills, add and share knowledge, hone talents as well as skills. According to Altintas et al. (2014) and Tarigan & Listyani (2021), poster presentation through competition can improve students' communication performance such as eye contact, gestures, fluency, pronunciation, vocabulary, and knowledge. This also can help students make poster presentations up to professional conferences (Su, 2020).

Poster-based learning also can enhance students' academic performance (Coşkun & Eker, 2018; Kartika Sari et al., 2020) and it enables students to develop positive feelings and emotions such as cooperation, achievement, respect, and responsibility (Demerci & Coskun, 2021). According to a study by Bahloul Amel (2014) and Ozturk (2017), a poster presentation is interesting because it has visual and verbal elements. Ross et al. (2019) stated that it is an efficient "fair and appropriate" method to address the issues discussed. Thus, according to Ross et al. (2019), poster presentation should be considered more widely as an innovative way to encourage deeper engagement and learning in a large classroom setting. Similarly, Howard (2015) found that posters have the ability to promote high-level thinking skills. Thus, the study of Dostal (2020) and Harsono et al. (2019) agreed that poster presentation is highly appropriate and relevant to be used as a form of learning strategy in improving the quality of learning and engagement with students. Past studies clearly show that poster-based teaching and learning yield positive impacts on students. Therefore, an academic poster competition

was held for the Introduction to Human Development Course (CTU001) at UiTM Perlis Branch themed 'Islamic Approach in Nurturing National Identity and Sense of Citizenship'. The participants of the competition consisted of pre-Diploma students. Students were given a poster preparation format as well as a scoring rubric. All competition and judging matters were done virtually through Google Drive, Google Docs, and Google Meet. Students were given the opportunity to show their creativity and subsequently they presented the findings of their research. A study to evaluate the effectiveness of the program and students' perceptions was conducted. This article discusses the findings of the study.

2. MATERIAL AND METHOD

The methodology of project implementation and research is based on the ADDIE model, which starts from analyzing, designing, developing, implementing, and evaluating. At the analysis stage, literature review and document analysis were conducted to see the effectiveness of poster-based teaching and learning that has been executed. Based on the findings, a framework for the implementation of the poster competition has been built (design and development) which includes the selection of themes, modus operandi, the appointment of committees and juries, and so on. Upon completion of the design phase, the poster competition is implemented according to the tentative and finally the analysis phase where a set of questionnaires was distributed to participants to obtain students' perceptions and effectiveness with regard to the study. Study data were analysed using SPSS 26.0.

3. RESULTS AND DISCUSSION

3.1STUDENTS PERCEPTION TOWARDS ACADEMIC POSTER COMPETITION

Table 1: Perception Towards Academic Poster Competition

Items	Mean	Standard Deviation	Interpretation Level
The task of producing a poster enhance students' interest in learning	4.06	.63	High
The task of producing a poster increase student understanding of the topics in the syllabus	4.20	.71	High
The task of producing a poster is fun	4.00	.64	High
The task of producing a poster increase knowledge related to the latest technology	4.10	.75	High
The task of producing a poster fosters a spirit of teamwork	4.23	.67	High
The task of producing a poster builds students' soft skills	4.10	.71	High
The task of producing a poster helps students appreciate what they have learned	4.16	.69	High
The task of producing posters gives students the opportunity to spread the pure values of Islam through new media	4.03	.85	High
I support the use of posters as the most relevant means of spreading the pure values of Islam	4.10	.66	High
The academic poster competition is a good appreciation of the students' efforts	4.03	.61	High
Total Mean	**4.10**	**0.69**	**High**

Table 1 shows that all students had a positive perception of the implementation of the academic poster competition with a high average level of the mean score (M = 4.10, SD = 0.69, n = 30). The lowest mean score is M = 4.00 where all students agree that the task of producing posters is fun, while the highest mean score is M = 4.23 where students agree that the task of producing posters instills good teamwork.

3.2EFFECTIVENESS OF THE ACADEMIC POSTER COMPETITION

Table 2: Effectiveness of The Academic Poster Competition

Items	Mean	Standard Deviation	Interpretation Level
I understood the lesson through the task of producing posters	3.99	.71	High
I understand more about Islamic values when producing posters	4.00	.74	High
I had the opportunity to try out the latest technology through the task of producing posters	4.03	.71	High
The task of producing a poster increase my enthusiasm for learning	4.03	.85	High
I am satisfied doing the poster assignment	4.03	.80	High
I had a lot of fun while doing the task of producing the poster	4.00	.69	High
I became a more creative person through the task of producing posters	4.06	.69	High
I was able to work in groups while performing the task of producing posters	4.00	.74	High
I managed to form a good relationship with the group members while producing the poster	4.06	.73	High
The task of preparing posters should be continued for students taking the CTU001 course	4.00	.74	High
Total Mean	**4.02**	**0.74**	**High**

Table 2 shows the findings of the effectiveness of the academic poster competition on students. These findings indicate that the academic poster competition had a positive effect on students with an average overall mean score at a high level (M = 4.02, SD = 0.74, n = 30). All ten items showed a high mean average from M = 3.99 to M = 4.06. The highest mean was M = 4.06 where students agreed that the task of preparing posters made them more creative and they were able to form good teamwork in performing the task. The lowest mean was M = 3.99 where students agreed that the task of preparing a poster increased their understanding of the lesson. Overall, these findings indicate that academic poster competitions are effective in improving students' knowledge and soft skills.

4. CONCLUSION

The academic poster competition is a teaching and learning initiative in the pandemic phase. It was implemented through online learning that has been proven to be effective in improving students' knowledge and soft skills. It helps lecturers to achieve teaching objectives with more interactive methods and in line with active learning methods in the 21st century. The findings of the study showed that students agreed with the effectiveness of the academic poster competition in improving their knowledge and skills, especially in using the latest software and technology in developing their soft skills. Students were able to express their ideas creatively as well as they managed to impart their knowledge which eventually could hone their communication skills, especially in video presentations

and Q and A sessions during the competitions. Therefore, this academic poster' competition program should be continued and further developed with a variety of more interesting and interactive methods in the future.

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VIRTUAL CHEMITHON AND PHYSICSTHON

Nor Aimi Abdul Wahab[1], Suhaiza Hasan[1,2], Nur Adriana Nisa Mohd Fuad[2], Alya Nurazmina Abdul Hamed[2], Dayang Nur Fatin Nadhirah Awang Damit[2]
[1]*Department of Applied Sciences, UiTM Cawangan Pulau Pinang*
[2]*Pra Pendidikan Tinggi, UiTM Cawangan Pulau Pinang*
Corresponding author email: suhaiza@uitm.edu.my

ABSTRACT

The pandemic COVID-19 has become a global health issue and has had a major impact on education. The way of learning has changed from face to face classes to online distance learning (ODL), whereby learning is undertaken remotely on the digital platform. Research has shown that online learning has the advantage of high efficiency, accessibility of time and place, and suits various learning styles. Despite these advantages, the student still finds it difficult to undergo online learning due to lack of focus, technology issues and longer screen time. As a result, most students feel demotivated, burnt out, and bored with the same routine during online classes. A survey conducted at UiTM Cawangan Pulau Pinang among pre-science students on the perceptions towards the final exam for chemistry and physics subjects shows that 70% of the students feel stressed about the exam, and 59% is not confident enough to score A for both subjects. One of the reasons is that students find chemistry and physics subjects difficult to understand and what's more with online learning. Using old and conventional revision styles with long ODL sessions worsens student performance. Thus, to help students better prepare for the chemistry and physics examination, a new semi-guided revision learning style that combines physical activity and practice questions has been developed. "Virtual Chemithon and Physicsthon " was created to help students understand and systematically revise the course, which could lead to better performance in both subjects. This Virtual Chemithon and Physicthon not only help the student to revise and answer the question for the preparation of the final exam but also encourages the student to lead a healthy lifestyle and enhance the student's happiness index. The Virtual Chemithon and Physicshton come with an e-template and where students need to complete the task and submit the e-template online to get an e-certificate. Students are required to answer all questions from each chapter and complete a 1-3 km run between chapters. At the end of this semi-guided revision, the student answered all questions and simultaneously completed a 10 km run. This new revision style ensures students have breaks between studies and encourages them to exercise. It also helps increase brain speed, improve emotional health, wellbeing and reduce stress. Research has also revealed that exercise after revision can help students retain information. It is hoped that using this semi-guided new revision style could improve students' performance in physics and chemistry.

Keywords: Chemithon, Physcicsthon, Revision, Exercise, Healthy lifestyle

1. INTRODUCTION

The COVID-19 disease has been declared a public health emergency worldwide by the World Health Organization (WHO). The COVID-19 crisis has forced educational institution closure in over 188 countries[1]. During this pandemic, the shift to online distance teaching and learning (ODL) brought about a real challenge for both educators and students[2]. They were forced to rapidly adapt to online learning. Even though online learning has been proven to help students excel academically, many students still find it challenging to adapt to online learning. One factor contributing to students' negative perception of online learning is the lack of face-to-face communication. Most online learning focuses only on theory rather than practice, and it requires the student to have strong self-motivation and good time management skills. The old and conventional online learning method also causes students to lose interest in the subject [3]. A survey conducted among pre-science students of UiTM Cawangan Pulau Pinang shows that 87% of the students still have their ODL classes from home. The results also show that 70% of the students felt stressed about their final exam, and 59% did not have confidence that they would get an A for chemistry and physics. It is also related to the fact that most of the students find that chemistry and physics are subjects that are difficult to understand and score.

There are various techniques and tips for revision are available for students.Most of the tips stated that having a lot of practice questions and good physical and mental health are among the factors that affect the effectiveness of the revision technique. These findings show that there is a need for a new revision learning method that can help students to do their revision in a fun way and having a balance between academic performance and good health. Thus, we have developed a new revision learning method to help students study chemistry and physics for the final examination by Virtual Chemithon and Physcisthon. Virtual Chemithon and Physicsthon is a new semi-guided revision learning style that combines both brain and physical exercises by answering a set of questions together with a virtual run. It is well known that the exams periods are commonly reported to be a stressful experience for the students [4] thus this concept will hopefully allow the students to enjoy their revision time compared to the old way of revising. Students also tend to spend more time focusing on revising for the exam without caring about their mental and physical health. Hence, this Virtual Chemithon and Physicsthon are created to balance between studying and taking care of physical and mental health. The reason for combining run together with normal revision is the fact that run provides benefits to the students by improving health, preventing disease, increasing energy level, boosting confidence, releasing stress, and it has the power to prevent depression. Studies also suggested that exercising released hormones that have a fundamental role in happiness [5]. This project aims to develop a semi guided revision learning style combining practice questions and physical activity to improve the academic performance for subjects CHM083 and PHY083 and enhance the happiness index and students' healthy lifestyle.

2. MATERIAL AND METHOD

Virtual Chemithon and Physicston is a new revision learning method where the student will get to revise the subject and exercise in between breaks. It is suitable for students to study or revise for the final examination. The main idea is to combine virtual marathons with revision. The steps to take part in Virtual Chemithon and Physicsthon is given in Figure 1. Virtual Chemithon and Physicthon require the student to first register via a google form. The student will then receive an email with the e-BIP for the marathon and an e-template, as shown in Figure 2 and Figure 3, respectively. Next, the student will complete the task on the e-template. It includes answering each chapter's question and going for a run in between revision breaks. Students are required to answer questions from each chapter, and after completing a chapter, students need to fulfill one physical activity, a 2-3 KM virtual run/walk. Students can fill in the e-template to record the completed task. After the task is completed, the students must submit the e-template for Chemithon and Physicsthon and the proof of running/walking through a google form. Upon completion of the task, the student will be given an e-certificate for their achievement to successfully complete the task together with the answer scheme. The sample for the e certificate is shown in Figure 4.

The purpose of having the Virtual Chemithon and Physicthon is to encourage students to exercise instead of only focusing on studying for the examination. Research has shown that physical exercise improves brain health and cognition, enhancing school performance and general functioning [6]. On top of that, it also increases brain speed, improves emotional health wellbeing, reduces stress, and helps to better retain information.

3. RESULTS AND DISCUSSION

The novelty of this project is that it is the first of a kind revision learning style of combining physical activity and practice questions that promote a healthy lifestyle among students, leading to good emotional and physical wellbeing on top of the excellent performance in CHM083 and PHY083. The benefit of this learning style is that it is an independent student-centered learning style that helps provide a stress-free environment for the students. It will also increase students' performance in CHM083 and PHY083. Furthermore, it helps to promote a healthy lifestyle and stimulate memorization among students. It is also considered an environmentally friendly method as it is 100% online, and no paper is needed in the process.

3.1TABLE, IMAGE AND FIGURE

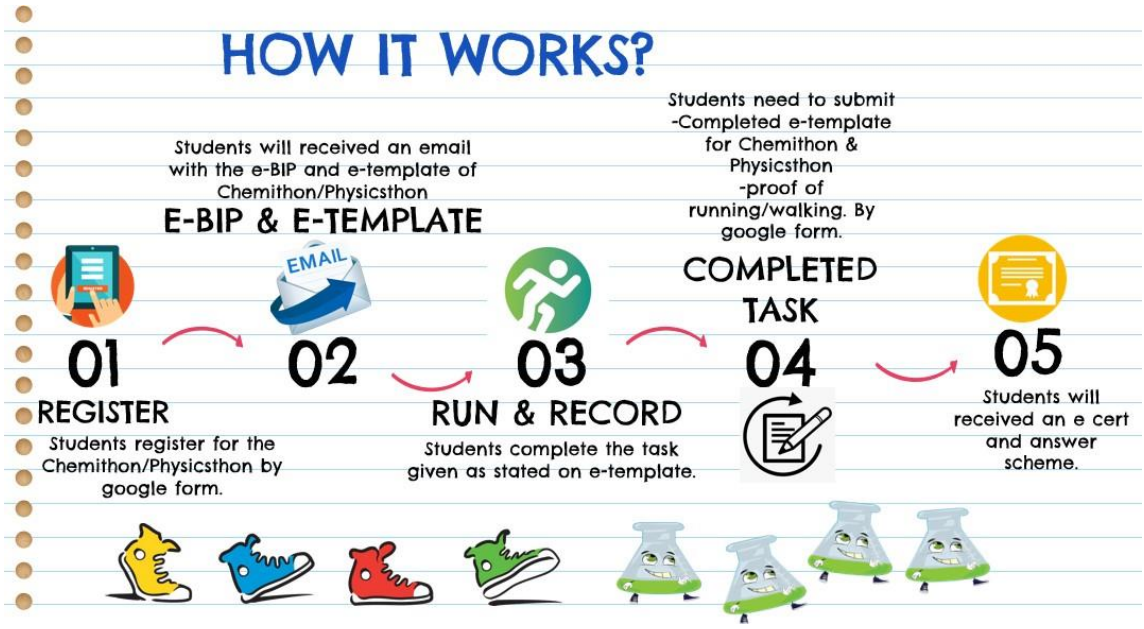

Figure 1: Steps for Virtual Chemithon & Physicsthon

Figure 2: The e-BIB for the Physicsthon

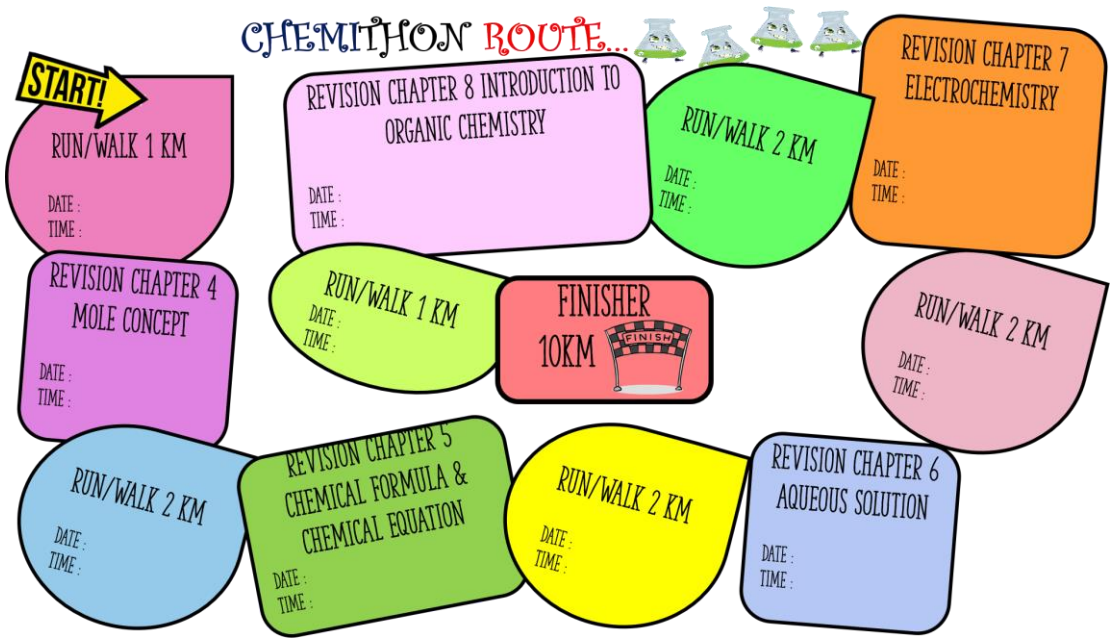

Figure 2a : Chemithon e-template

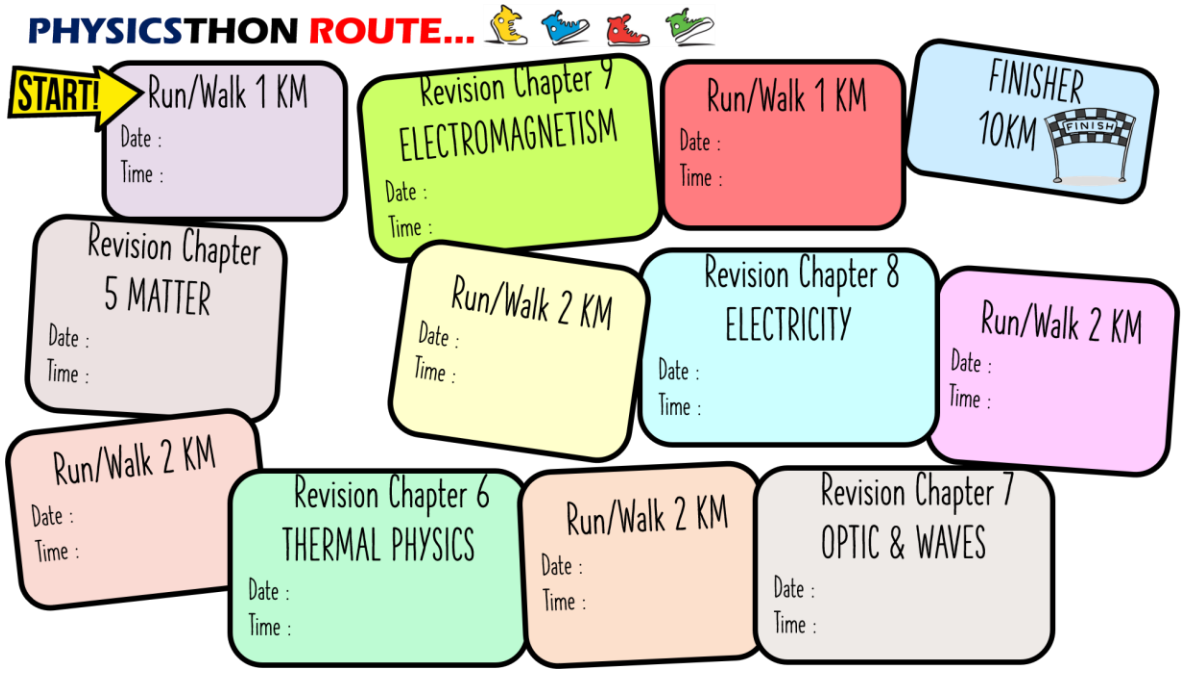

Figure 2b : Physicsthon e-template

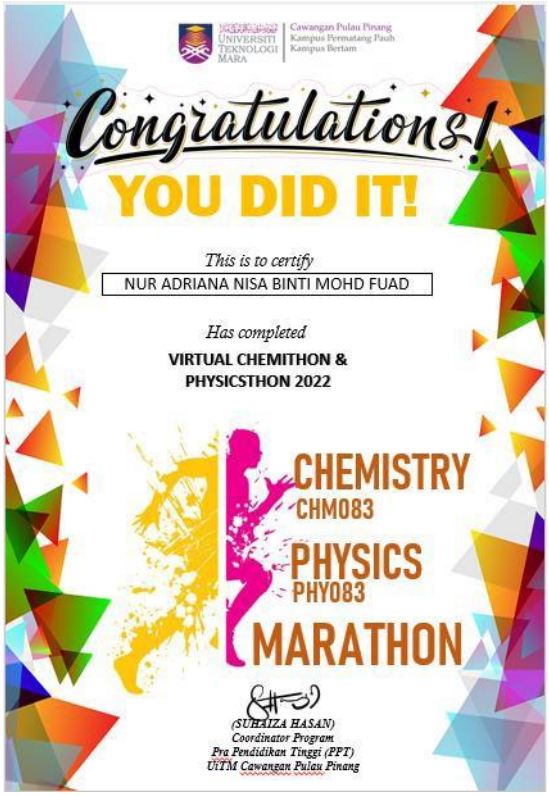

Figure 3: e-certificate sample

4. CONCLUSION

The use of Chemithon and Physicsthon as a new revision method is hoped to better help the student do their revision and increase their performance in chemistry and physics subjects. This method should provide benefits and act as a trendsetter for a new way of revision learning that provides a balance between academic and physical health.

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MGTClick

Nor Zarina binti Mohd Salim[1], Hafini Suhana binti Ithnin[2], Muhammad Aiman Najmy bin Mohd Helmy [3], Nurul Shazwani binti Mohd Yusoff[4], Nur Mashitah binti Abd. Rasid[5]

[1]*Department of Business Management, University Teknologi MARA (UiTM), Malaysia Norza919@uitm.edu.my*
[2]*Department of Business Management, Universiti Teknologi MARA (UiTM), Malaysia hafinisuhana@uitm.edu.my* [3]*Faculty of Business Management, university Teknologi MARA (UiTM), Malaysia*
aimnajmy12@gmail.com [4]*Faculty of Business Management, university Teknologi MARA (UiTM), Malaysia*
shazwaniyusoff123@gmail.com
[5]*Faculty of Business Management, university Teknologi MARA (UiTM), Malaysia*
mashitah1229@gmail.com

ABSTRACT

Online Distance Learning (ODL) has become a new norm of teaching since Covid-19 hit the world 2 years ago. This situation gives some challenges and creates new pressure towards students as well as lecturers. Thus, MGTClick is an online system that was developed to help *Pra Pendidikan Tinggi (PPT)* students who enrolled in MGT028 (Introduction to Business) to manage, monitor as well as to plan one of their subjects. The purpose of this study is to facilitate PPT students to organize their study and reduce their pressure in managing each folder, links and application involved in one subject. While using this MGTClick it will help students to gather all the information about that subject under one roof. It only required one click for students to access relevant information regarding that subject. However, this application needs to collect all the information manually tin order to create a new link for the selected files. Finally, all the links will be joined together in domain home. Hence, it is hoped that this application will give some value to lecturers and PPT students who are totally new with the university system and to reduce missing information.

Keywords: Online Distance Learning (ODL), MGTClick, *Pra Pendidikan Tinggi (PPT)*

1. INTRODUCTION

It has been 2 years since Covid-19 hit the world. Many sectors and businesses are affected including the educational system. Fewer students are allowed to stay at university and most of us are conducting hybrid and online classes. This situation gives some challenges and it creates new pressure towards students as well as lecturers. Based on the reference in the previous literature, it shows that students are uncomfortable with online classes and prefer courses with practical contents, continuous interaction and hands-on projects (Trespalacios & Lowenthal, 2019).

Conducting online classes is totally different from physical classes that require high speed internet, adopting new software and divergent teaching techniques to grab student's attention. There is also a bundle of links, folders, and applications that both students and lecturers need to apply. A previous study indicates that 30.2% showed high levels of stress while conducting online classes while 55% considered it to be moderate (AlAteeq et al., 2020).

From an internal survey conducted to 203 total of *Pra Pendidikan Tinggi (PPT)* students of UiTM Seri Iskandar batch October 2021-Mac 2022 indicated that 40% students have not managed to remember and organize all the information regarding one subject. This includes assignments percentage, platform for assignment submission, date for submission and so on. This has been shown that 81 students are poor at managing the important information.

2. MATERIAL AND METHOD

MGTClick is an online platform that developed based on information collected from one course in *PPT* program which is Introduction to Business (MGT028). Method used to create this platform is MyLink applications. Lecturer collected all the course materials and converted to link formation and inserted to MyLink includes links for online class, attendance, course materials and assignments matter. During the class session, the lecturer just needs to share the link to students and ask them to keep and use it until the end of semester. Figure 1.0 below shows the complete application used.

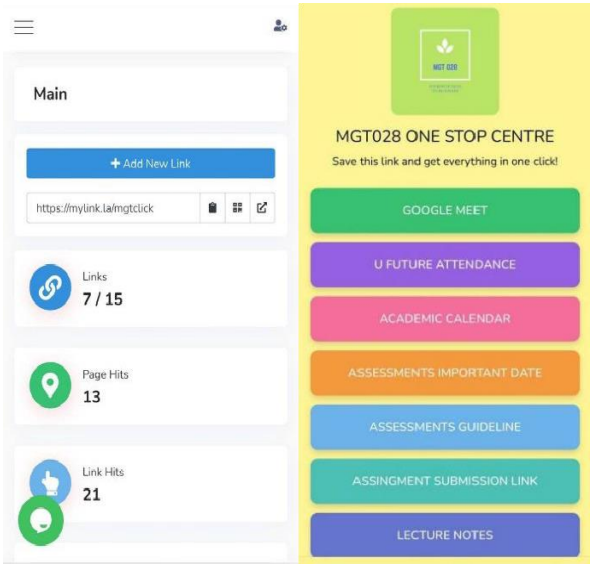

Figure 1.0: MGTClick Application

3. RESULTS AND DISCUSSION

Registration Interface

To use this application, the lecturer must create an account by registering it using a google account, Facebook or Twitter. The other way is by manually registering as shown in Figure 2.0 below. The information includes username, email account and password for security.

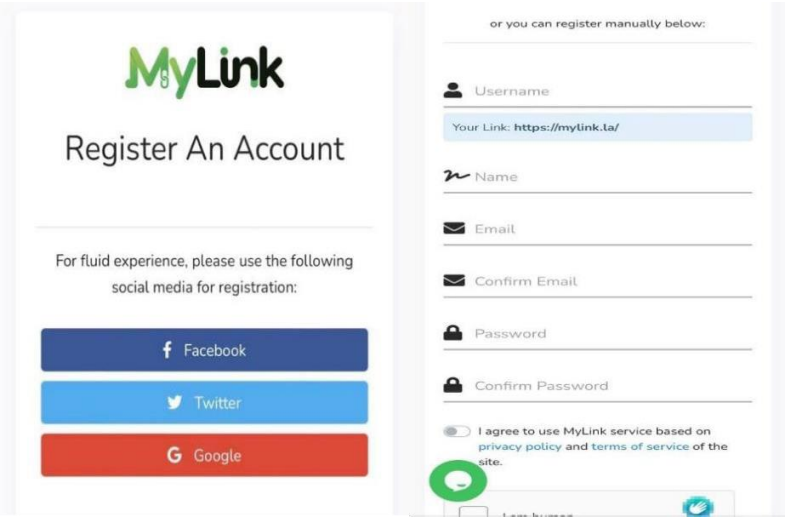

Figure 2.0: Registration of Application

Page Interface

Once the registration is completed, the notification of successfully registering an account in MyLink will be emailed to google account owner as shown in Figure 3.0 . Account owners need to click verify email address to make sure the account use is available and legal to use.

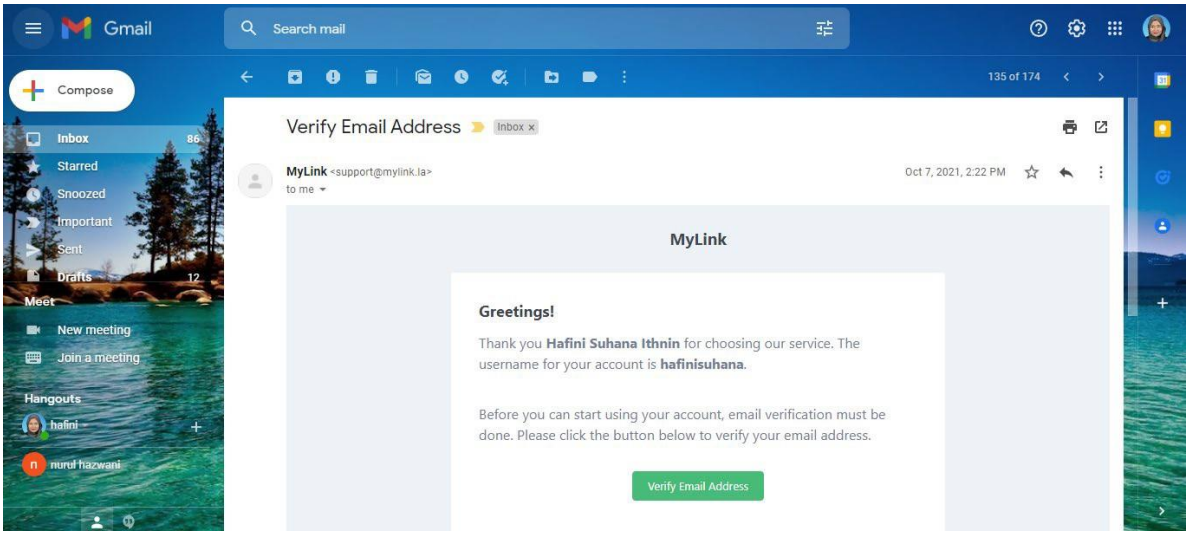

Figure 3.0: Notification from MyLink on registration of an account

Based on Figure 4.0, Figure 5.0 and Figure 6.0 below, The MGTClick stage interface consists of main page, links insertion and appearance. In the main page it will illustrate the performance of our page including how many links had been uploaded, page hits and link hits. While for the links interface, the lecturer is able to insert all the information that has been converted to link format and copy it to this page by clicking add new link. Last but not least is the appearance interface. Within this part, the lecturer uses creativity to decorate the page. For example, inserting the avatar, changing the avatar shape, selecting the name for this page, description and many more.

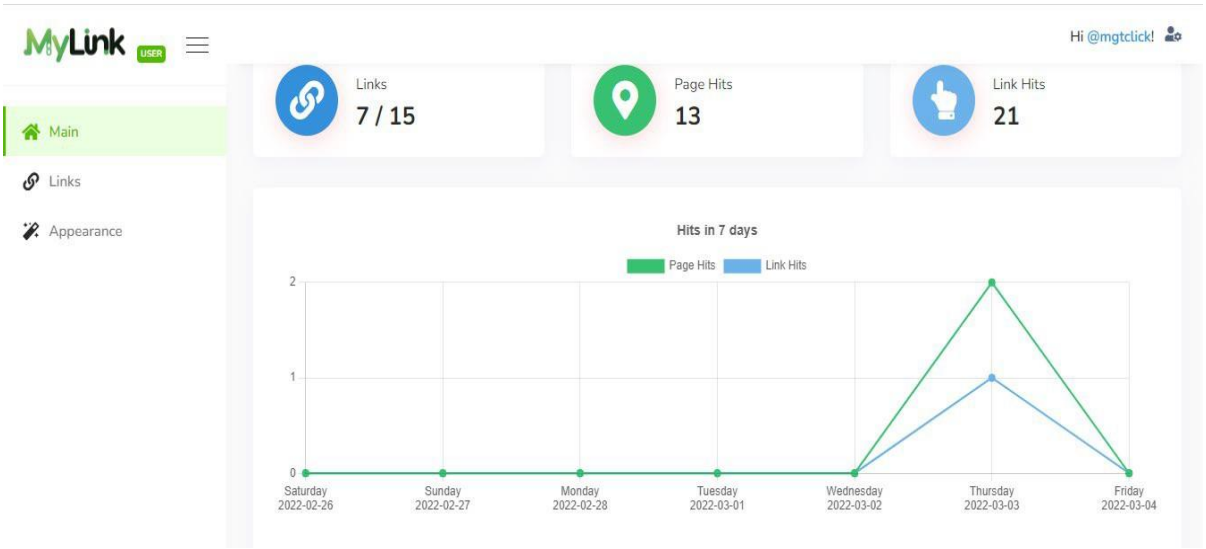

Figure 4.0: Main Page

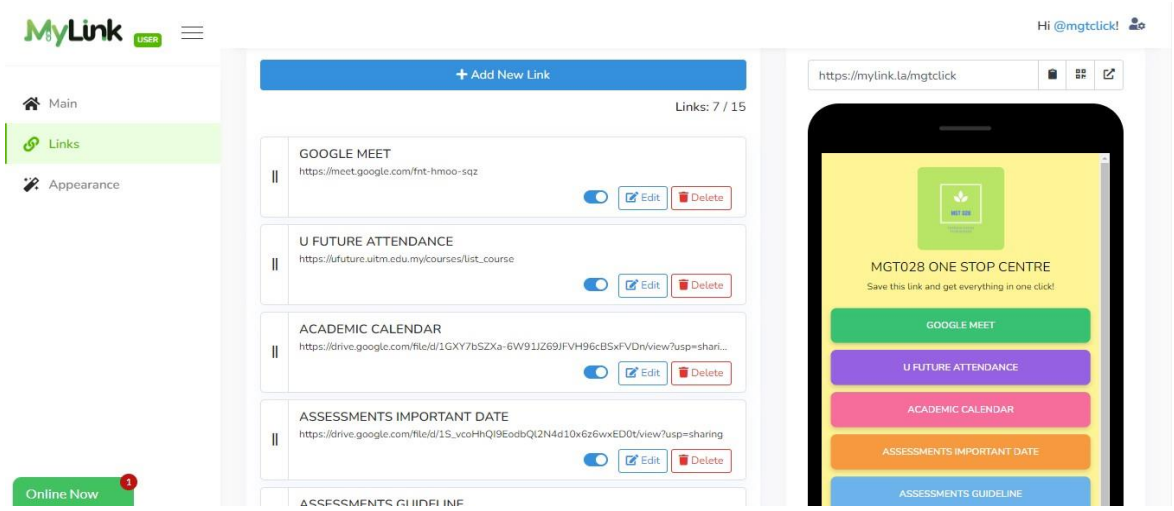

Figure 5.0: Links Page

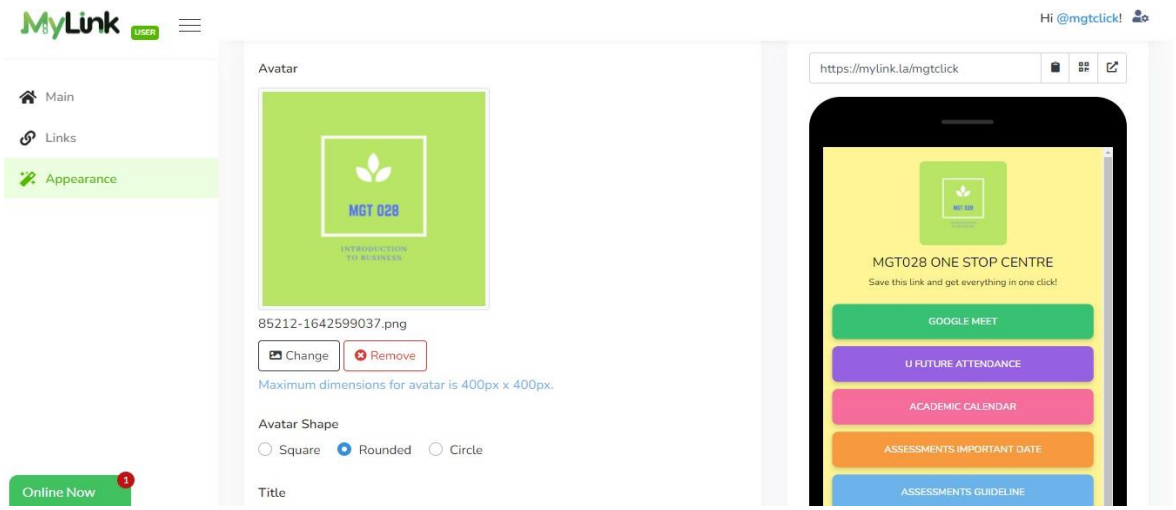

Figure 6.0: Appearance Page

4. CONCLUSION

As a conclusion, the significance of MGTClick at this development stage is to facilitate PPT students to plan their study and manage their time wisely. However, this application is not limited to one course only, it can also be developed using any materials such as other code subjects, business activities, employee's workload and so on. It is hoped that with this application it may reduce several pressures and give some solutions for plenty of critical online learning activities.

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IN HOUSE SOLUTION

Roha Mohamed Noah[1], Ammarhaziq Sa'aidon[2], Muhammad Suhaimi ShamsulAkmar [3], Muhammad Syamel Azlie[4], Imtiaaz Naushad[5]

[1]*Faculty of Business & Management , Universiti Teknologi MARA (UiTM) Cawangan Johor, Malaysia*
[2,3,4,5,6] *Pra Pendidikan Tinggi, Universiti Teknologi MARA (UiTM) Cawangan Johor, Malaysia*

Corresponding author e-mail: roham994@uitm.edu.my

ABSTRACT

This study aims to identify students' feedback on solving simultaneous equation problems using proposed calculator activity In-House Solutions. In-House Solutions was proposed as some students were having difficulties in solving equations problems with using the existing calculators equipped with various formula facilities. Two aspects have been focused on, namely the processes and strategies used by students to solve simultaneous equation problems using calculators effectively. The study involved 27 Pre-Diploma students from UiTM Johor. In 2017, Abbas, Benchohra, Lazreg & Zhou conducted a data collection focusing on activities before using the calculator and after using the calculator. The data obtained were analyzed quantitatively using linear scores proposed by Matar (2018). The problem- solving process in this study includes four phases namely understanding the problem, planning solutions, implementing planning and reviewing. The study also showed that students used various problem-solving processes and strategies when using the calculator activity effectively compared to without using the calculator activity. Integral equations play an important role in mathematical analysis of natural and learning problems. Due to this importance, researchers have been devising new and improved ways to find accurate and efficient solutions to integral equations for decades. This study recorded positive feedback from students who used In-House Solutions in solving the equation problems.

Keywords: equations, problem solving, calculator, effective ways, strategies

1. INTRODUCTION

Mathematics is an important tool in human life (Nik Azis, 2008). This is because mathematics is used in various daily activities such as counting, measuring, comparing, evaluating, decision making, problem solving, explaining, representing and identifying and developing a model. According to Nik Azis again, from the point of view of learning, mathematics should involve the process of learning to know, to do, to be and learning to live as a responsible human being. Furthermore, mathematics must involve purposes that encompass domains namely knowledge for knowledge, knowledge for utility and knowledge for appreciation. Therefore, mathematics is a subject that needs to be mastered well and in the interest of every student.

In this situation, students are not encouraged to spend excessive time while solving more complex mathematical problems (Xie, 2021). There are also teachers who believe that the goal in solving a mathematical problem is only to get the right answer (Swati, Singh, Verma & Singh, 2020). The objective of this study is on the strategies and processes taken by UiTM Johor Pre Diploma students and problem solving methods that contain similarities. Yusufoglu & Erbas (2008) stated that problems involving simultaneous equations involve one linear equation and one non-linear equation before and after using the calculator. This study provides an indication that the use of technology needs to be expanded in teaching and learning. Instructors should also try to diversify strategies or methods in problem solving and this can only be helped by the use of technology. Every student has a variety of abilities that require different approaches of one or two methods in finding a solution to a problem. This variety of strategies or methods can open students' minds and change students' perceptions of mathematics as a subject that is rigid to flexible

2. MATERIAL AND METHOD

In-House Solution

The technique used In house Solution is to solve the equation problem using a calculator formula easily, specially to get the correct answer and to see how to press the calculator correctly. By using the correct formula, students may produce the most accurate answer and to make mathematics more fun. Besides that, using the correct technique also may solve complicated equation problems quickly and enhance the capabilities of students to use an effective calculator by the formula provided. Here is an example of a calculation using a calculator formula:

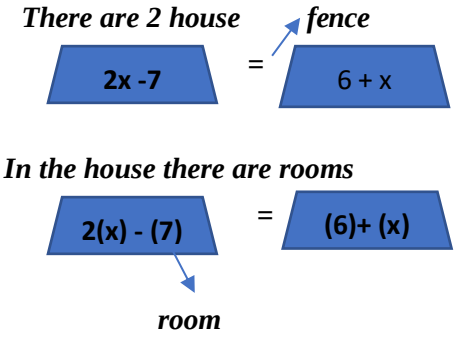
A. In House solution : Concpet

- *One house has two walls*
- *The house has a room*
- *Each room has @ walls*
- *Between house to house has a fence*
- ***The walls are brackets "( )", the fence are equal " ="***

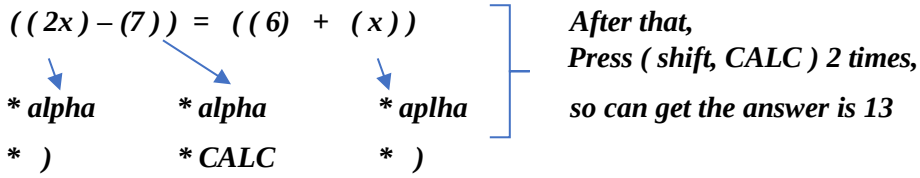
B. Example Question: 2x -7 =6 + x

- *Steps 1 : Have 2 house*
- *Steps 2: First house 2x-7*
- *Steps 3: First house have 2 room which is (2x) and (7)*
- *Steps 4: Second house is 6+ x*
- *Steps 5: Second house also have 2 room which is (6) and (x)*

C. Example Question:



D. How to press the calculator :



Data Collection

A survey questionnaire was distributed to Pre-Diploma students who experienced In-House Solution to get their feedback.

3. RESULTS AND DISCUSSION

The feedbacks are shared in the following figures:

3.1 Students' Feedback on In House Solution

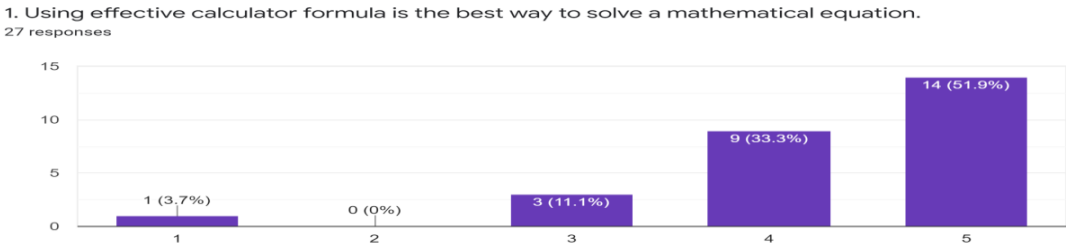


Figure 1: Students' Feedback on using an effective calculator formula is the best way to solve a mathematical equation.

Based on Figure 1, 50% of the students strongly agree that In House Solution is the best equation solved by effective calculator formula and they will enjoy using that calculator formula.

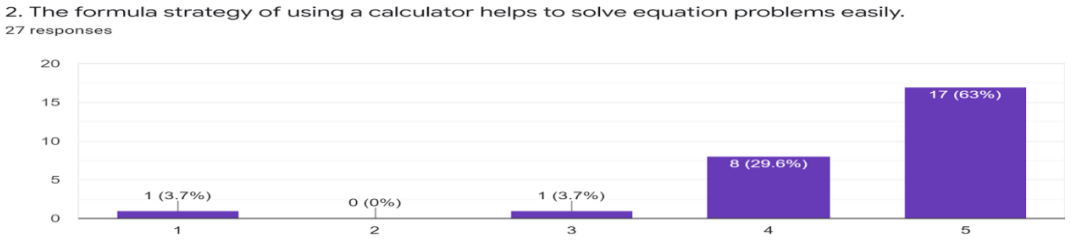


Figure 2: Students' Feedback on their formula strategy of using a calculator helps to solve equation problems easily.

Figure 2 shows that 63% of the respondents strongly agree that using a calculator helps to solve equation problems easily and make them more efficient.

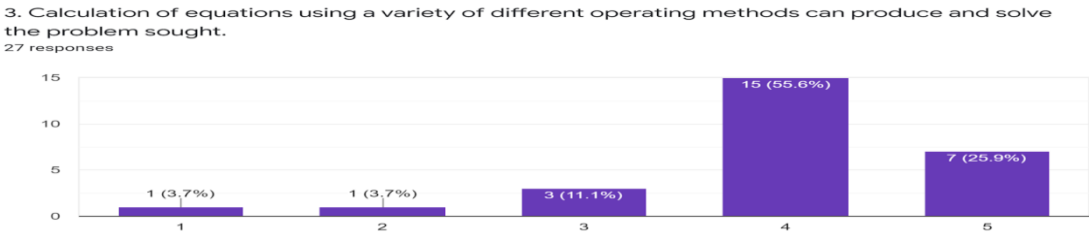


Figure 3: Students' Feedback on their calculation of equations using a variety of different operating methods can produce and solve the problem sought.

Figure 3, 55.6% of the respondents agree by using this formula and may solve the problem sought with a different ways.

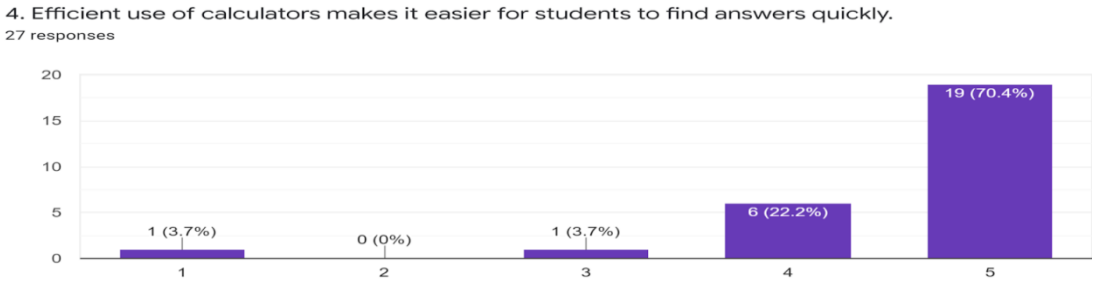


Figure 4: Students' Feedback on efficient use of calculators makes it easier for students to find answers quickly

Figure 4, 70.4% of the respondents strongly agree that by using the calculator, it makes it easier for students to find the answer quickly and faster.

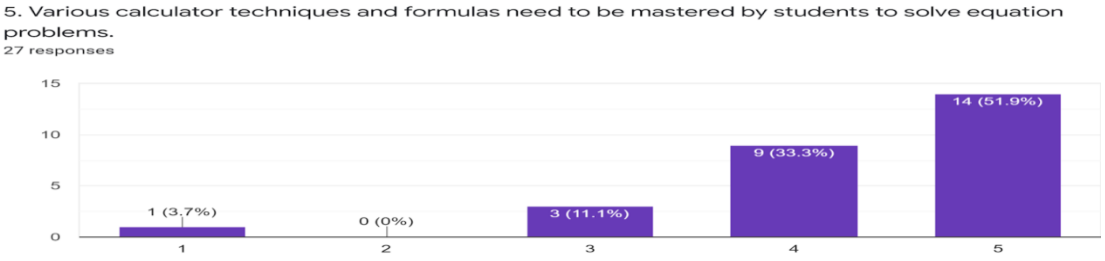


Figure 5: Students' Feedback on their various calculator techniques and formulas need to be mastered by students to solve equation problems.

Figure 5, 51.9% of the respondents strongly agree using various techniques and formulas to solve equation problems and they will try the various techniques.

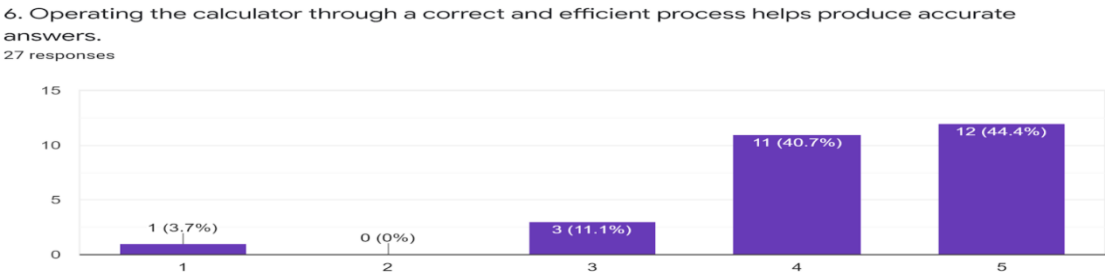


Figure 6: Students' Feedback on their operating the calculator through a correct and efficient process helps produce accurate answers

Figure 6, 44% of the respondents agree by efficient operating technique and help them to find the correct answers.

4. CONCLUSION

This study is a quantitative method that is limited to UITM Johor Pre -Diploma students. Through the activity using the calculator called In-House Solution,the researcher found that some students saw the problem-solving activity only focused on getting the final answer alone without finding the meaning in each answer by doing a review. Revisions are not only on the answers but can also be done on the algorithms run.

Traditional learning and teaching for this topic only emphasizes strategies using formulas to find solutions. Calculations are traditionally feasible because the calculations will take a long time and are able to distract the students from the essence of the question. Yet the use of a calculator is able to allow this strategy to be implemented without wasting a lot of students' time or distracting, in fact this strategy helps students see the problem solving for this topic from a different perspective, Therefore, this study is in line with the opinion of Zeng, Balenu, Bai & Wu (2020), who stated that using a calculator can solve complex calculations through numerical and graphical methods that are impossible to solve using written methods. This variety of strategies or methods can pen students `minds and change students` perceptions on mathematics as a subject that is rigid to flexible.

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MOLP: LEARNING MATH THROUGH ONLINE LEARNING PORTAL

Nur Ain Najla Fakhrunrozi[1], Irdina Nurain Zahiyan[2], Nur Athirah Zamri[3], Wan Anisha Wan Mohammad[4], Rafizah Kechil[5]

[123]*PPT, UiTM Cawangan Pulau Pinang,Malaysia*
[45]*JSKM, UiTM Cawangan Pulau Pinang,Malaysia*

Corresponding author e-mail: inovasiprojek@gmail.com

ABSTRACT

The Covid-19 pandemic has tremendously changed our daily routine especially in the education field. Open distance learning or ODL was implemented as another alternative for students and educators to continue the teaching and learning process as they did not get to meet physically. Many platforms have been used by educators to deliver teaching and learning materials to students. This enables students to access learning material anywhere, at any time. However, most of the materials are scattered everywhere. There is no one platform that students can use to access all the materials easily and interactively at the same time. Thus, MOLP: Learning Math through Online Learning Portal was developed as a one-stop centre to combine all the interactive materials together. At the same time, since it is developed by students themselves, MOLP can provide another way of revision where students do not only use MOLP in their studies, but MOLP developers can enhance their knowledge on the course when they develop the content. MOLP was specifically developed for Pre-Commerce students who are learning Intensive Mathematics 1. A survey has been conducted to understand the student's limitations with the distribution of the current learning materials and their satisfaction in using MOLP. All the respondents agreed that MOLP can help them in their studies and they fully recommended MOLP to their friends.

Keywords: MOLP, one-stop centre, revision

1. INTRODUCTION

Learning portals are online learning tools which provide a set of learning materials that are combined and stored in one place and can be accessed over the Internet. Online portals provide many advantages to users such as students can use them to access the content while educators for communication and getting information. Besides that, parents can get the latest information about their children's study places and activities, while the education institution itself can provide information on anything related to the institution to outside users [1]. By using an online learning portal, students can access notes easily and at any time.

Learning Management Systems (LMS) are online learning portals where they provide a two-way communication between educators and students. Besides accessing the learning materials, students can also communicate with their lecturers through the forums provided in the system [2]. Most of the education institutions nowadays provide their own LMS for the benefit of educators and students. However, this LMS depends on the lecturer to upload all the materials in a form of document or slide and students need to download the materials for them to read the content. However, some lecturers use different platforms such as Ms Teams and Google Classroom to deliver the materials to the students. Though, like other LMS, this platform needs the students to download all the shared materials and store it in their storage devices.

To overcome this problem, MOLP was developed as it can be a one stop centre for students to get all the materials easily, anywhere at any time. Besides that, the content in MOLP is interesting and interactive as it is created using the latest medium such as TikTok and Wordwall and the contents are presented using animated videos. At the same time, MOLP is developed by the students themselves.

Hence, MOLP does not only provide interactive online materials to students but also will help the developers in their revision during MOLP development

2. Product Description

The main platform to develop MOLP is by using Google Sites. It is a platform provided by Google as a web page creation tool included as part of the free, web-based Google Docs Editors suite. Google Sites is a tool that can help to create a webpage using plain text and webpage creators do not need to have knowledge on HTML. Moreover, Google Sites provide the template based system which can be customized easily. It is the easiest way to make information accessible to people who need quick and up-to-date access [3].

MOLP features consist of notes which are developed using MS PowerPoint. To make it more interactive, animations are applied to the slides and are converted into videos. PowerPoint can be a very easy and useful tool for all students to create notes after they have learnt each lesson in class. PowerPoint slides are now a platform which is almost expected by anyone to prepare a good and easy presentation [4]. It has been widely used by students and academicians as it enables them to quickly make better, neat, and professional presentations [5].

Besides that, MOLP also contains video features which are developed using the TikTok application. TikTok is a video-sharing social networking app which is rapidly growing. Besides sharing other contents, TikTok can be a very useful tool for sharing knowledge [6]. [7] In their studies, they agree that most students prefer using TikTok video as a learning tool as it is more interesting and enjoyable. TikTok allows anyone to become a creator as it is easy to use and encourages users to share creative expression videos up to 3 minutes.

Finally, exercises featured in MOLP consist of Mathematics examples and solutions which are also created using PowerPoint. Other than that, to make MOLP more interesting, students can test their knowledge after learning each chapter by playing games provided in MOLP. These games were created using Wordwall. Wordwall is a gaming platform which contains a collection of related work which can be converted to interesting activities or games [8]. Wordwall can be used to create interactive activities such as playing directly on the Net while printable activities can be printed out as PDF and be played manually. Wordwall activities can be very useful to evaluate students' understanding after they have learnt each topic [9].

MOLP Interface

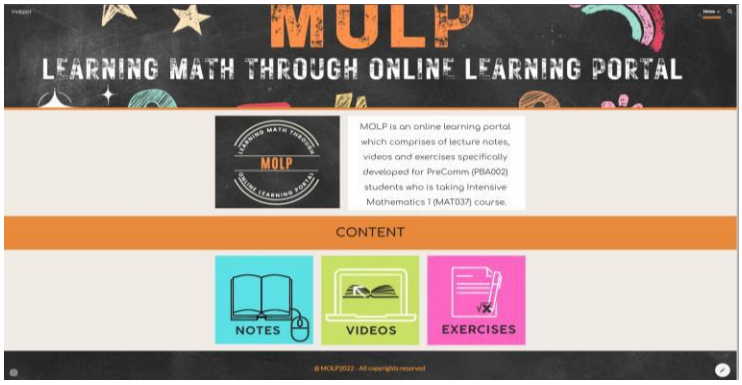

Figure 1: MOLP main page

3. RESULTS AND DISCUSSION

This paper is to identify students' revision method and MOLP satisfaction in learning MAT037 among Pra Pendidikan Tinggi (PPT) students. PPT is a program which is aimed to help students from the B40 group whose SPM result is below the minimum requirements to pursue their studies in UiTM. A survey was conducted to 50 Pre-Commerce (PBA002) students from UiTM Cawangan Pulau Pinang who are taking Intensive Mathematics 1 (MAT037) course for semester October 2021-February 2022. The questions were divided into three parts which are:

a) Demographic
b) Revision method
c) MOLP satisfaction

The findings are represented in the graph below. Figure 2 shows the respondent's difficulties in accessing the learning materials. Even though most students did not have difficulty in accessing the learning materials, yet 40% of the students still have difficulty when accessing it.

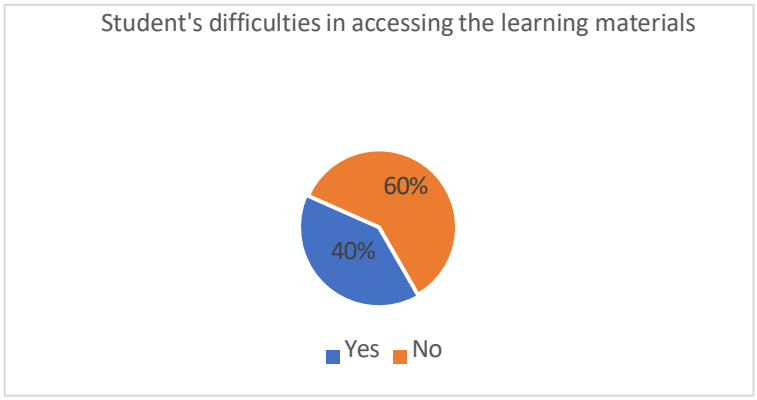

Figure 2: Student's difficulties in accessing the learning materials

Figure 3 illustrates the student's satisfaction in using MOLP. Most of the students are satisfied with MOLP as they found that MOLP is interesting and can help them easily in their studies.

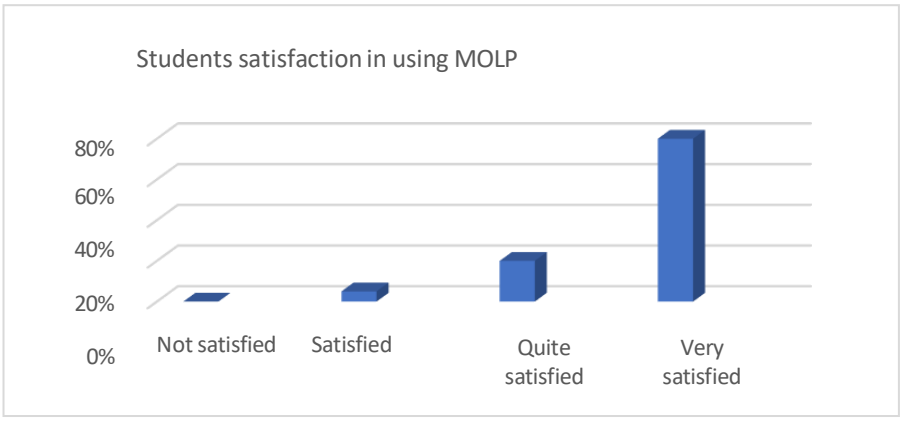

Figure 3: Student's satisfaction in using MOLP

Figure 4 shows the students recommendation of using MOLP to their friends. All the students recommend their friends to use MOLP in learning MAT037 course as most of them like the interface of MOLP and they prefer to use MOLP as one of the revision tools.

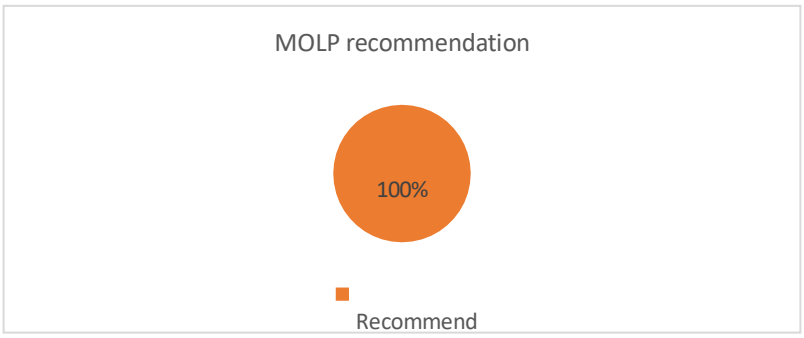

Figure 4: MOLP recommendation

4. CONCLUSION

MOLP: Learning Math through Online Learning Portal is an online learning portal which was developed as a one-stop centre to combine all the interactive learning materials together. Besides that, since it was being developed by the student itself, MOLP can provide another way of revision where students do not only used MOLP in their studies, but MOLP developers can enhance their knowledge on the course when they developed the content. MOLP was specifically developed for Pre-Commerce students who is learning Intensive Mathematics 1 course. Its features consist of interactive notes and videos, and exercises which contains examples and solutions and games to test the user's knowledge on what they have learnt. Most of the students who used MOLP are satisfied with MOLP as it provides an easy way for them to access all learning materials. They also fully recommended MOLP to their friends so that everyone can learn mathematics in an easy and interesting way.

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STEM EDUCATION

BALLOON TO THE MOON

Norsazliyana Binti Mohamad Ismail [1], Effa Shadira Binti Baharudin [1], Nurfarah Atiqah Binti Mohd Asmady [1], Amyra Syazwanee Binti Roslee [1], Nurul Aqilah Binti Halim [1]

[1] *Melaka International College of Science and Technology (MiCoST), 75300 Melaka, Malaysia*
E-mail: norsazliyana@micost.edu.my

ABSTRACT

Balloon Rocket Model Experiment was demonstrated to understand the fundamental Physics principle of 2nd law and 3rd law of Motion. This experiment applied a Physics concept involving pressure and thrust force. Different types of load were attached to the filled air balloon before release. The balloon was hung on a horizontal string with a straw used as a stabilizer. It was observed that the greater the load, the more force is needed to accelerate that object. Besides, the increased weight from the cargo slows down the balloon rocket. The results obtained obey the second law and third law of motion and give a clear visualization to enhance students' understanding of both laws.

Keywords: Pressure, Thrust, Newton's Second Law, Newton's Third Law

1. INTRODUCTION

The first principle of rocketry was tested more than two thousand years ago and this first principle is often associated with Elon Musk, who uses this approach to come up with his business ideas and innovative product designs. The first principle approach has been used by many great thinkers including inventor Johannes Gutenberg, military strategist John Boyd, and the ancient philosopher Aristotle, but no one embodies the philosophy of first principle thinking more effectively than entrepreneur Elon Musk.

[2]The hot water vapor causes a rise in pressure, and in this project we use this pressure to push water out of the soda bottles and propel the rocket upward. This rocket is controlled by an onboard timer circuit that runs off a 9-volt battery and ignites the gasses electrically using model rocket igniters. In this experiment, a rocket's movement depends on a concept of Force, Newton's Second Law, Newton Third Law of Motion, Thrust and Pressure. To propel a rocket, some kind of force must be expelled from the rocket in order to push it forward. [1]Sir Isaac Newton was one of the first scientists to study force. He states that a push or pull on an object is called a force. For this experiment, the mechanical force that pushes a rocket aircraft through the air is known as a thrust.

Two of Newton's Laws of motion are related to force, and therefore, related to thrust. Newton's Second Law of Motion states that the rate of momentum of a body is proportional to the applied force and takes place in the direction in which the force acts. Therefore, the greater the mass of an object, more force is needed to accelerate that object. According to Newton's Second Law, the rate change of momentum is proportional to the applied force F=ma where F is a force, m is a mass and a is an acceleration. Newton's Third Law of Motion states that for every action there is an equal and opposite reaction means that in every interaction, there is a pair of forces acting on the two-interacting object. The size of the force on the first object is equal to the size of the force on the second object. The direction of the force on the first object equals the size of the force on the second object.

Newton's Second and Third Laws of Motion play a part in how a rocket lifts off. As a rocket burns fuel, hot gas is created and forced out of the back of the rocket. As the gas is expelled, the rocket is propelled with equal force in the opposite direction, and the force exceeds the weight of the rocket.

[4] Scientists have to adjust the rocket fuel and the exhaust nozzle for different missions based on the distance the spacecraft has to travel and its mass.

[3]Building paper rockets enables students to tie together many different concepts in physics such as in particular, the equations of motion linking velocity, acceleration, distance and time, as well as the principles of aerodynamics. In this experiment, the rocket is propelled by pressure. Pressure is the amount of force exerted on an area. The pressure inside the balloon serves as the fuel for the rocket. When you release the opening of the balloon, gas quickly escapes, equalizing the pressure inside with the air pressure outside of the balloon. As the air escapes from the balloon, it exerts a force on the ground and the air outside of the balloon. According to Newton's Third Law of Motion, as the gas is released from the balloon and pushes against the outside air, the outside air pushes back. As a result, the rocket is propelled forward by the opposing force. This opposing force is thrust.

2. MATERIAL AND METHOD

Chairs, Balloons, Straws, String, Masking Tape, Eraser, Cloth Peg, A4 Paper, Scissors, Permanent Marker, Stopwatch, Measure Tape and Electronic Scale.

Experimental Procedure

Firstly, one end of the string was tied to a chair. The other end of the string was put through a straw. Then, the string was pulled tight and tied to another chair. Next, the balloon was blown up and pinched to keep the air inside. The balloon was not tied and later taped together with the straw so that the opening of the balloon was horizontal with the ground.

Next, two students were needed for this part where one student would ensure the air remained inside the balloon by continuing pinching the opening of the balloon and the other one student taped the balloon together with the straw. The balloon was pulled all the way back to the end of the string (the starting point) by one student, so the balloon opening would be against the chair.

Then, one student held the tip of the balloon. The finished line at a distance of 0.4meter was drawn by another student using the permanent marker near the end of another side of the string. The balloon flew freely through the string and the movement was observed as a result. Then, the process was repeated 2 times with different methods with 'cargo' such as no-load, added load as an eraser and a cloth peg across the string to the finish line. Lastly, data was recorded

3. RESULTS AND DISCUSSION

As shown in Table 1, the speed of the balloon flew twice during the trial without load for empty cargo with a mass of 0.003kg, it flew for 1.01s from starting point to the finishing line with a distance of 3.35m. The speed for a balloon without cargo (Table 2) was 3.29 m/s. Next, with load (cloth peg) refer to Table 3 with a mass of 0.008kg; it flew for 1.08s from the starting point to the finishing line with a distance of 2.23m. The speed for a balloon with cloth peg was 2.19 m/s. The last one with load (an eraser) refer to Table 4 with a mass of 0.015kg, flew for 0.77s from starting point to the finishing line with a distance of 1.40m. The speed for a balloon with an eraser was 1.81 m/s.

The way the balloon flew to the front or horizontally can be referred to Figure 3.6 and Figure 3.7. The prediction in this experiment is, when the balloon pulls all the air out and pressure exists to help the balloon fly to the front. Then the straw brings the balloon flying through the string from the starting point to the finishing line. Lastly, the number of time and distance were different each time the project was run due to the presence of cargo.

Pressure has subunits in it; Newton's First Law, Newton's Second Law and Newton's Third Law of Motion. Pressure is the amount of force exerted on an area (blow into balloon). In this experiment, Newton's Second Law and Newton's Third Law were applied to the rocketry balloon project. Newton's Third Law of motion was shown when the gas was released from the balloon and pushed against the outside air, the outside air pushed back. This opposing force is thrust. The thrust is a mechanical force that pushes a balloon through the air, refer Figure 8 and force is a push or pull acting on a balloon, which causes a change in position or motion.

Some precaution steps were taken during the experiment. Firstly, the experiment was run in an open space. Secondly, the equipment was placed and set on a flat surface. Thirdly, all the electrical instruments such as stopwatch and electronic scale must be functioning. The possible errors may occur during the experiment such as the balloon moves to the side and not horizontally and mistakes in calculating and taking data for the mass of loads, time taken and distance balloon flown from starting point to the finishing line.

3.1TABLE, IMAGE AND FIGURE

DATA:
Fix Distance: 0.4 meter
Mass Empty Cargo: 0.003kg

Table 1: Collected Data

TYPES OF LOAD	MASS (kg) (Load+Cargo)	TIME TAKEN, t(s)		DISTANCE FROM STARTING POINT TO FINISH LINE,s (m)	
		First Trial	Second Trial	First Trial	Second Trial
Without Load	0.003	1.05	0.97	3.94	2.75
Cloth Peg	0.008	0.91	1.25	2.15	2.30
Eraser	0.015	0.69	0.84	1.51	1.28

Table 2: Collected Data Without Load (Empty Cargo)

Trial 1	Mass,m (kg)	Time,t (s)	Distance,s (m)	Average speed, v (m/s)
1	0.003	1.05	3.94	= 3.94 1.05 = 3.75
2	0.003	0.97	2.75	= 2.75 0.97 = 2.83
Average	= 0.003 + 0.003 2 =0.003	= 1.05 + 0.97 2 = 1.01	= 3.94 + 2.75 2 = 3.35	= 3.75 + 2.83 2 = 3.29

Table 3: Collected Data Cargo with Load (Cloth Peg)

Trial 1	Mass (kg)	Time (s)	Distance (m)	Average speed (m/s)
1	0.008	0.91	2.15	= 2.15 0.91 = 2.36
2	0.008	1.25	2.30	= 2.30 1.25 = 1.84
Average	= 0.008 + 0.008 2 =0.008	= 0.91 + 1.25 2 = 1.08	= 2.15 + 2.30 2 = 2.23	= 2.36 + 1.84 2 = 2.19

Table 4: Collected Data Cargo with Load (Eraser)

Trial 1	Mass,m (kg)	Time,t (s)	Distance,s (m)	Average speed,v (m/s)
1	0.015	0.69	1.51	= 1.51 0.69 = 2.1
2	0.015	0.84	1.28	= 1.28 0.84 = 1.52
Average	= 0.015 + 0.015 2 =0.015	= 0.69 + 0.84 2 = 0.77	= 1.51 + 1.28 2 = 1.40	= 2.1 + 1.52 2 = 1.81

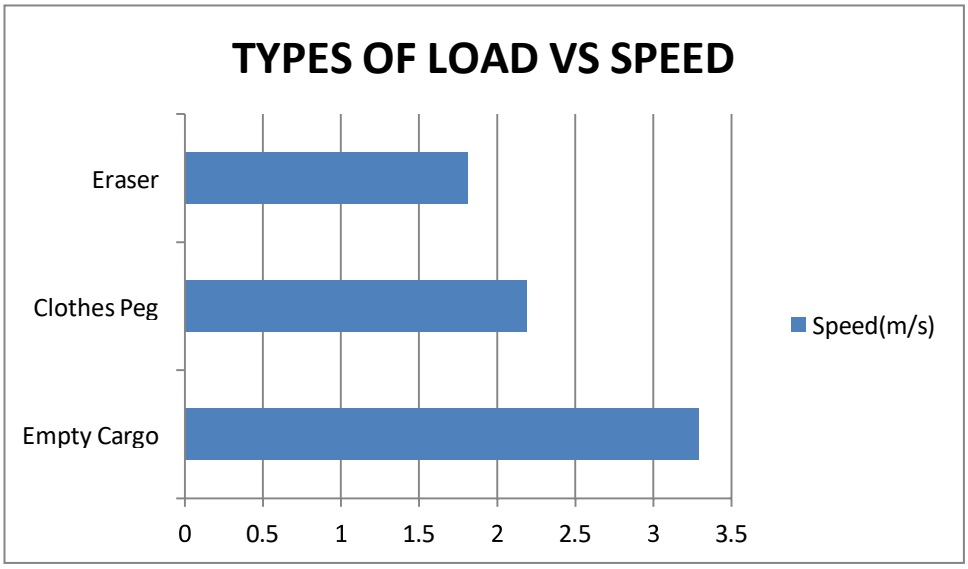

Figure 1: Types of load vs Speed

Based on **Figure 1 ,** it can be concluded that the speed of empty cargo is slower down which is 3.29 m/s compared with the speed of a cloth peg which is 2.19m/s and the speed of an eraser which is 1.81 m/s. It can be said that when more load is added, it will take a short time and distance to stop at the finishing line and there is also an increase in the value of speed. Additionally, different loads contribute to different values of speed.

IMAGE AND FIGURE:

Figure 2: Without Load (Empty Cargo)

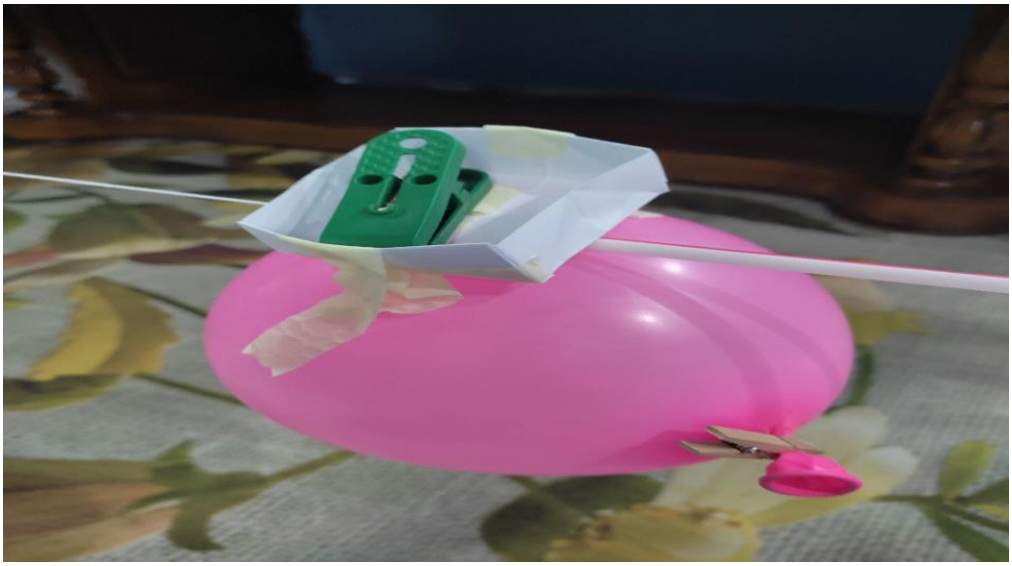

Figure 3: Cargo with Load (Cloth Peg)

Figure 4: Cargo with Load (Eraser)

Figure 5: Blow the air into the Balloon

Figure 6: Balloon at an Upper Side

Figure 7: Balloon at Downside

Figure 8: Movement of the Balloon

4. CONCLUSION

A simple rocket made with a balloon was propelled down a string according to Newton's Laws of Motion, because of thrust generated by pressure. This is because the acceleration (a) of an object as produced by a net force is directly proportional to the magnitude of the net force (F), in the same direction as the net force, and inversely proportional to the mass (m) of the object. This relationship is described by the equation: F = ma. The acceleration of an object depends on the mass of the object and the amount of force applied. When one object exerts a force on a second object, the second object exerts an equal and opposite force on the first.

Furthermore, once the balloon has been set up, the balloon travels along the string track. Pressure from the gasses inside the balloon pushes those gasses out of the balloon when it is released. As the gasses escape from the balloon, they exert a force on the outside air, which in turn exerts an opposing force and pushes the balloon forward.

The experiment was successful and the objectives were achieved, thus following the fundamental Physics principle of 2nd law and 3rd law of Motion. Newton's Second Law of Motion states that the relationship between a balloon mass (kg), its acceleration (a), and the applied force (F) is described by the formula F = ma. The results showed different speeds with different loads where the speed of empty cargo is 3.29 m/s, cargo with cloth peg is 2.19 m/s and cargo with eraser is 1.81 m/s. Newton's Third Law of Motion states that for every action, there exists an equal and opposite reaction.

For future research, in order to move the balloon faster along the track, pressure of the gas inside the balloon needs to be increased. Besides, when more loads are added into empty cargo to the balloon rocket, the increased weight from the cargo slows down the balloon rocket and thus, speed will increase. In addition, this set of balloon rocket model is cheap but at the same time enhances students' understanding and creates more fun and interesting learning for students.

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SIRT 2.0: SMART INTERACTIVE REVISION TOOL

Muhammad Ashrul Hardy Bin Mazrul[1], Muhammad Aiman Bin Safien[2], Muhammd Faiz Bin Zainal[3], Azlina Binti Mohd Mydin[4], Wan Anisha Wan Mohammad[5],

[1,2,3]*Program Pra Pendidikan Tinggi (PPT), Universiti Teknologi MARA, Cawangan Pulau Pinang, Malaysia*
[4,5]*Jabatan Sains Komputer & Matematik (JSKM), Universiti Teknologi MARA, Cawangan Pulau Pinang, Malaysia*

Corresponding author e-mail: inovasiprojek@gmail.com

ABSTRACT

Smart Interactive Revision Tool (SIRT 2.0) is a new approach to perform revision in an interesting up to current situation that align to STEM education. This approach allows the student from all levels of education either from school or university student to enjoy their revision duration. Students face problems while doing revision such as they will feel bored to do revision. SIRT 2.0 allows the student to create their own revision notes and example interestingly in video form using TikTok. This SIRT 2.0 is the upgrade version from the 1st edition with additional features. SIRT 2.0 is designed especially for Pre-Comm students for subject MAT 037. Student can create short video notes on the topic from the syllabus according to their understanding. A survey has been done to know the satisfaction about SIRT 2.0 among the Pre-Comm students from UiTM Cawangan Pulau Pinang. Around 60 students were involved in the survey. From the survey, almost everyone satisfied and enjoy doing revision using SIRT 2.0. They also liked the style of the videos in SIRT 2.0 that could help them in doing revision through notes and examples for the MAT 037 subject. SIRT 2.0 has been the best approach to perform revision as an easy and interactive way in engaging STEM education.

Keywords: interactive, online education, Tik Tok, education videos, style of study

1. INTRODUCTION

In March 2020, the world was attacked by COVID-19 pandemic. The education system has changed their traditional face to face (f2f) to online education. Nowadays all levels of education from preschool until university are in the online education system. Smartphone, laptop, tab and desktop will be the main medium for this education style. To make the revision process align to the education style, SIRT is introduced. Students usually face problems and feel bored in doing the traditional way of revision. Besides that, students also have problems in sharing revision notes to their friends.

SIRT is a new approach that aligns to STEM education that can be used for the students' revision process. It allows students from all levels to do revision in an interesting and attractive way. The main reason why the idea for SIRT is to create simple, attractive, and easy-to-understand content. SIRT 2.0 also provides animated and interactive content which can be accessed easily, anywhere at any time. Initially, SIRT was developed for secondary school students so that they can do short notes videos for reading subjects like science. SIRT got a good response from the secondary school student. Therefore, SIRT 2.0 was introduced to Pre-Comm students in Mathematics. In SIRT 2.0 there are new features and styles introduced as compared to previous SIRT. The uniqueness of SIRT 2.0 are the videos in it are interactive, and fast learning up to trend of online learning. Besides that, SIRT 2.0 videos are interesting and easy to understand with creative video notes.

Previous study mentioned that videos have become an important part of higher education teaching and learning during online classes. Several analyses have shown that technology can enhance learning and multiple studies showed that video, specifically, can be a highly effective educational tool [4], [5]and [6].

The effective use of video as an educational tool can be enhanced once instructors consider three elements: how to manage cognitive load of the video; how to maximize student engagement with the video; and how to promote active learning from the video [3]and [7]. To maximize the benefit from educational videos, there are three important key components used which are cognitive load, impact engagement, and the video should promote active learning [1]. A survey has been done to TikTok users, and the findings discovered that content quality, task technology fit, and vividness have significant influences on overall effectiveness on learning [2].

2. MATERIAL AND METHOD

SIRT 2.0 has been developed based on Program Development Life Cycle (PDLC) steps as shown in Figure 1. There are five main steps in PDLC that start with analysis, design, implementation, testing and documentation.

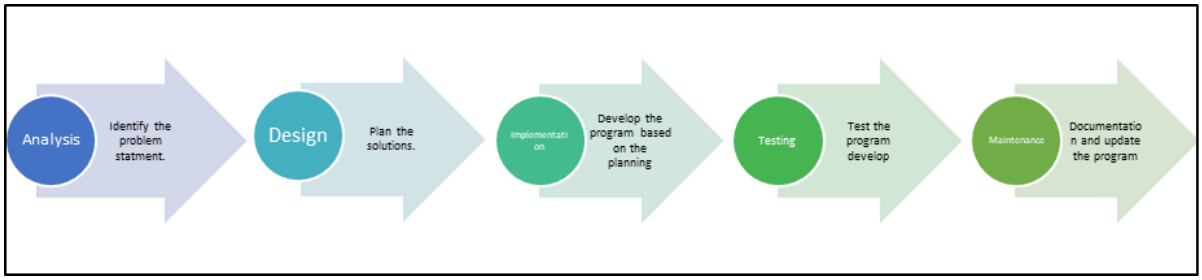

Figure 1: PDLC design

Firstly, the problem statement was identified. The problem was students felt bored to perform revision in the traditional way. Besides that, students once clearly understood the requirements to solve the problem, the solution was defined as SIRT. Next, the scratch design interface for video style and content that could be delivered interestingly was planned. Then, the video was developed and created using TikTok. After developing the video, the video was shared to a few students to test on their satisfaction.

3. PRODUCT DESCRIPTION

In the SIRT 2.0 approach, there are videos developed using the TikTok application. TikTok application is selected to create revision videos because, nowadays TikTok has been one of the easiest applications that could be used and shared in social media. Besides that, TikTok could be easily installed in users' smartphones. The social media application TikTok is very potential as an educational tool since it enables the delivery of small learning units in a short time period or duration [2].

SIRT 2.0 is developed especially for Pre-Comm students for mathematics subject named MAT 037. The videos were developed based on notes and examples. This method was selected for this subject due to the fact that mathematics students need to know how to apply the concepts in the solutions. In SIRT 2.0, there are also audio explanations given in the videos. Figure 2 is the sample of design interface for the video in SIRT 2.0.

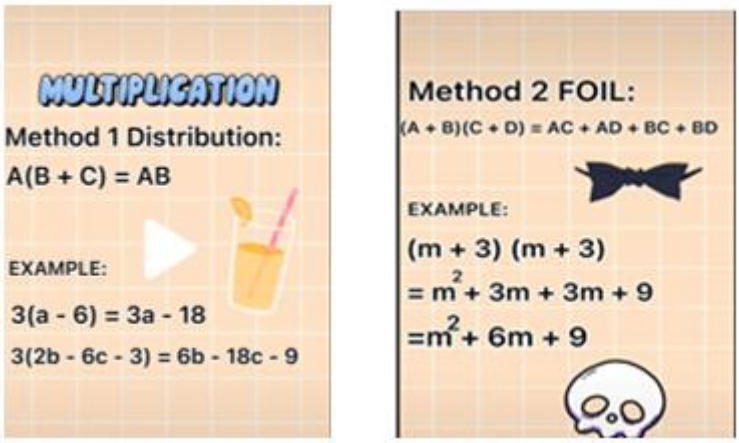

Figure 2: Sample of SIRT 2.0 video interface

4. RESULTS AND DISCUSSION

A survey has been conducted among Pre-Commerce (PBA002/PBA003) students from UiTM Cawangan Pulau Pinang who are currenlty taking Intensive Mathematics 1 (MAT037) course. The questionnaire was distributed among students in the current semester, October 2021-February 2022. The main purpose of the questionnaire was to identify the student's opinion and satisfaction while using SIRT 2.0 as their revision tool in learning MAT037. The questions were divided in two parts which were:

a) Demographic
b) SIRT 2.0 satisfaction

Below are the results and findings from the questionnaire distributed among the students. The table above shows the demographic information about the respondent. There are 60 students involved in this study. 32 of them were female students while 28 of them were male students. A total number of 33 of them were staying on campus and the remaining 27 were staying in their own hometown. This is based on the situation of Covid 19 pandemic and online learning environment.

Table 1: Respondent Demographic

	Male	Female
Gender	32	28
Stay In Campus	15	18
Stay in Hometown	17	10

Figure 3 illustrates the respondent's satisfaction in using SIRT 2.0. 83% of the respondents were satisfied with SIRT 2.0 as it could help them during their revision time especially for MAT 037. They were also happy that they did not have to carry the textbook around for their revision. They also realized that by using SIRT 2.0, they could communicate and share their video notes easily with their friends.

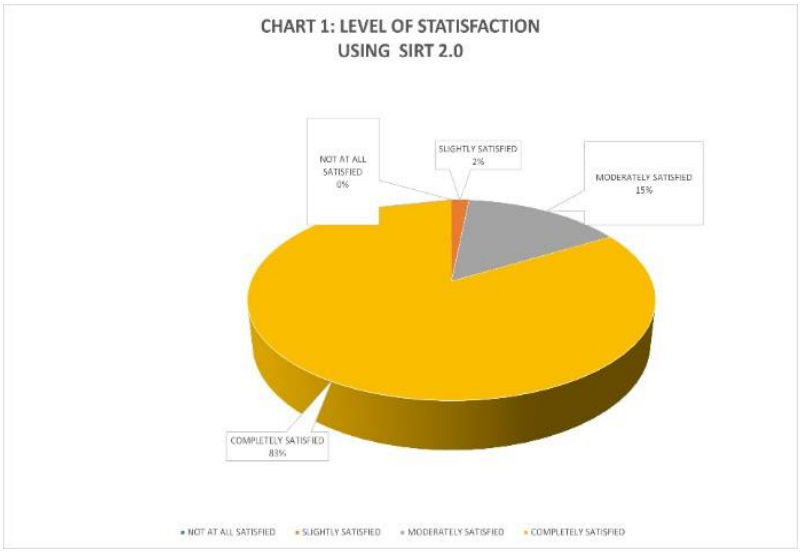

Figure 3: Student's level of satisfaction using SIRT 2.0

Figure 4 below shows that 96.67% respondent likes the video style in SIRT 2.0. The video in SIRT 2.0 has the notes with the explanation given. Only 5% of the respondents dislike the style of SIRT 2.0 video. This is due to the fact that a colorful effect was applied in the video.

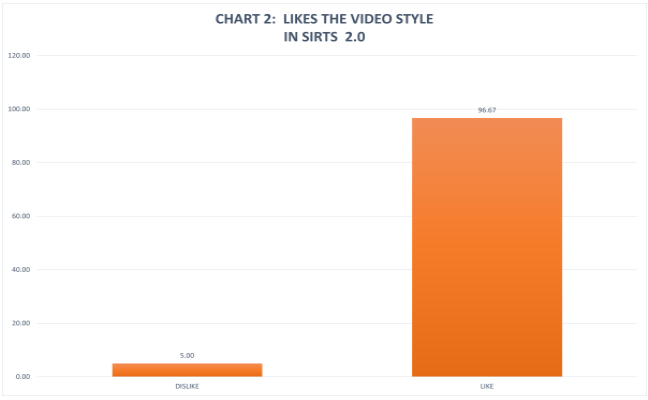

Figure 4: Student's likes on the SIRT 2.0 video style

5. CONCLUSION

SIRT 2.0 is an approach in trend to the STEM educational system. With the existing SIRT 2.0 approach, this method allows the students from all levels of education to enjoy their revision time. SIRT 2.0 allows students to foster self-regulated learning and enjoy their revision time in an interactive and interesting way. Besides that, SIRT 2.0 also allows students to share their video revision notes easily with friends. In future, SIRT 2.0 can be upgraded as a courseware and can be charged with minimal fee.

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COMPARATIVE STUDY OF METHODS FOR TEACHING PERIODIC TABLE 'PT MADE EASY' IN CHEMISTRY SUBJECT

Siti Noriah Mohd Shotor[1], Sheikh Ahmad Izaddin Sheikh Mohd Ghazali[1*], Wilson Alyadrian Amat[1], Muhammad Haiqal Muistaqim bin Juraizam[1]

[1]*Universiti Teknologi MARA Cawangan Negeri Sembilan, Kuala Pilah Campus,Negeri Sembilan,Malaysia*

Corresponding author e-mail: sheikhahmadizaddin@uitm.edu.my

ABSTRACT

Chemistry is one of the most difficult subjects in school because it requires critical thinking and problem solving skills. The subject involves the study of the composition, properties, and reactions of matter at the chemical level. This article will focus on the periodic table, which is a table that organizes the chemical elements according to their atomic number. The periodic table is also known as the periodic chart, which is a chart that visually organizes the elements by their atomic number. The problem with the students that have no basics in chemistry is that they can't understand the periodic table. Understanding this periodic table is particularly important for the subject of chemistry itself. For students who are just learning this subject for the first time, such as STEM C students, will be experiencing difficulty to understand the periodic table. Thus, this study will be focusing on the comparison between memorization techniques through songs and comparing them with conventional method. As a result, from the survey we did, it was found that musical memorization is easier to memorize compared to the usual method.

Keywords: Periodic Table, comparative, Pre Higher Education, STEM C, chemistry subject

1. INTRODUCTION

Malaysia faces the problem of having a lack of students who are interested in choosing the science stream. This occurs even though various facilities and incentives have been provided by the government such as full boarding science schools, science colleges, MRSM and so on [1]. However, this problem gets worse from year to year and the result is detrimental to our country in the future where our country's dream to achieve a developed country will be stunted [2]. To overcome this problem, Universiti Teknologi MARA (UiTM) through the Pre Higher Education Center (PPT) has taken the initiative to create a Pre Diploma in Science Program (STEM C & Literature Stream) where students from the literature stream in secondary school are given the opportunity and space to study pure science subjects such as chemistry, biology, physics and mathematics. Starting from October 2021-February 2022 semester, the STEM C pilot project was initiated at UiTM Negeri Sembilan Kuala Pilah Campus. For the chemistry subject, one of the most important elements in this subject is the Periodic Table. It is one of the basic knowledge that must be learned by all students who want to learn the chemistry subject. Given the difficulty faced by STEM C students in memorizing the elements contained in the Periodic Table, a memorization technique using lively rhythmic music has been introduced to STEM C students as opposed to conventional memorization methods. Therefore, the main objective of this study is to perform a comparison between conventional method and musical method for memorizing the Periodic Table to determine the effectiveness from the STEM C students' point of view.

2. MATERIAL AND METHOD

An analytical study was conducted between October 2021 to November 2021. A planned questionnaire was given to the students to obtain the required information. In this study, primary data were obtained by conducting a closed-ended online questionnaire to ensure that the data accuracy and consistency is in line with the objectives of the study. The measurement scale used was a five-likert scale on a continuum from strongly disagree to strongly agree to measure either a positive or negative response to a particular statement [3–4]. The study was conducted at the campus of Universiti Teknologi MARA Kuala Pilah branch and the results were collected involving students who registered for the course of analytical separation methods (CHM011). Based on the responses obtained, 17 students participated from the target population, comprising a 100% response rate. This study used a non-probability sampling technique known as facility sampling technique due to its advantages of being simpler and less time consuming (Sekaran and Bougie, 2016). In this sampling technique, the units that are sampled are collected without any specific probability structure while the analysis method used in this study includes descriptive analysis to achieve the objectives of this study.

3. RESULTS AND DISCUSSION

Demographic profile of the study

Figure 1 shows the distribution of male and female students involved in this study as well as the campus involved. Based on gender, female students accounted for 47.1%, while male students accounted for 52.9% of the total 17 respondents.

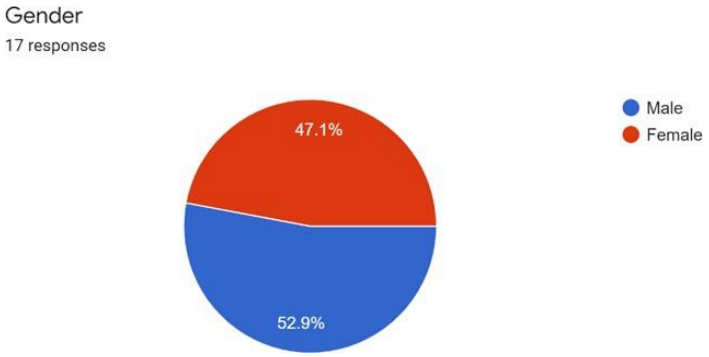

Figure 1: Percentage of respondents gender

For this study, the questionnaire is divided into two parts, namely before and after students learn the Periodic Table singing technique. Figure 2 shows the percentage of students' interest in the Periodic Table before learning this technique. It was found that 12 students or 70.6% of students stated that they were less interested and had difficulty memorizing the Periodic Table since it is difficult to memorize using the conventional method.

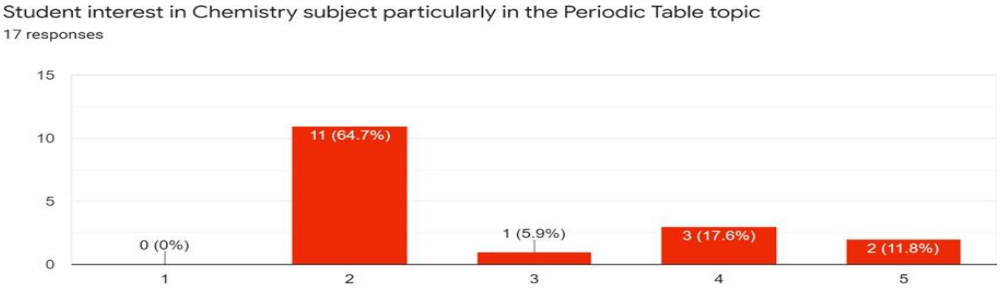

Figure 2: Students' level of interest in the Periodic Table using conventional memorization techniques.

After the students had used the singing technique for memorizing the Periodic Table, we conducted another questionnaire with respect to that purpose. As a result, we found that students' interest has increased towards the Periodic Table and also interest in the chemistry subject itself. This is proven when a total of 6 students chose the score of 4, which is agree, while 7 other students chose strongly agree (a score of 5). In contrast, no students chose the scale of 1-3. Similarly, the respondents were asked questions regarding students' interest in chemistry subjects after this technique was carried out, where 35.3% of students and 64.7% of students chose scales 4 and 5, respectively.

Figures 3 and 4 show the percentages as stated above.

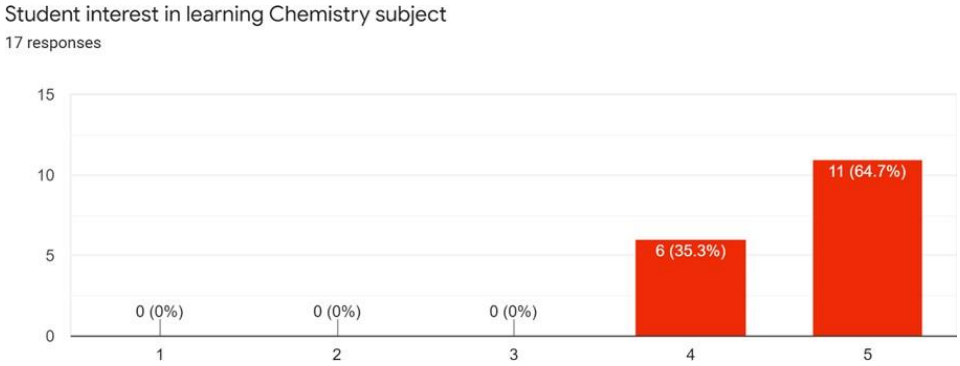

Figure 3: Students' interest in chemistry subject after the PT Made Easy Technique is Implemented.

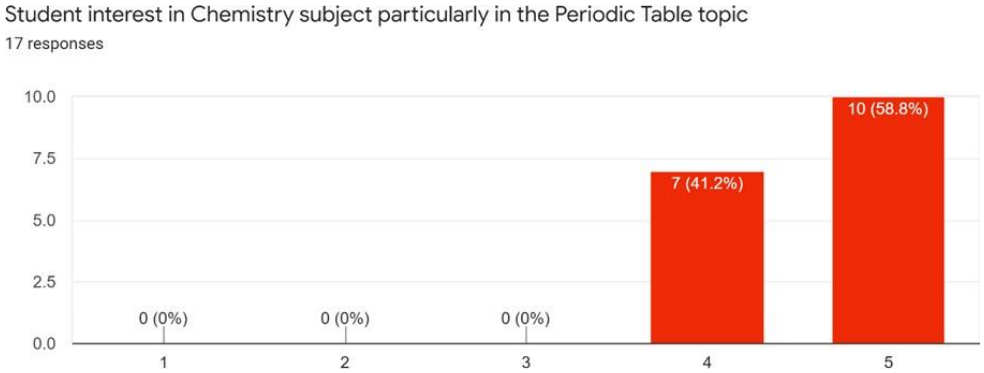

Figure 4: Percentage of students' interest in the Periodic Table after the PT Made Easy Technique was Implemented

4. CONCLUSION

In conclusion, this PT Made Easy technique has attracted students' interest in chemistry lessons and has also made it easier for students to memorize the Periodic Table. It is the lifeblood and knowledge of "must know" by new students who want to get acquainted with this chemistry subject.

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MINI AQUACULTURE FISH POND DESIGN

Mohammad Haiqal Bin Hassan[1]. Viduriati Binti Sumin*[1], Mohd Azizul Adzman Bin Jabi[1], Mohammad Arman Amerul Bin Mohammad Asyraf[1], Alciey William Uyo[1]

Faculty of Plantation and Agrotechnology,
Universiti Teknology MARA, Sabah branch.
Corresponding author e-mail: vidur595@uitm.edu.my)

ABSTRACT

Agriculture business activities, including cropping, livestock, and aquaculture can generate substantial profits if well managed. Limited resources, such as land and area available for business use, especially in agriculture and fisheries, pressure the fish farmer to maximize the use of these resources to increase revenues. With the new technology advancement, fish farming in tanks has become more popular and used by the fish farmer. A fish farmer produces fish in confined places to efficiently convert fish food into fish flesh. Fish tanks conserve space and water and, more importantly, can be harvested faster compared to traditional practices. Thus, this study will guide the students to prepare the mini aquaculture fish pond to be applied in actual business activities and to identify the innovation talent among the students in preparing their mini aquaculture fish pond design.

Key words: Mini Aquaculture, Fish pond.

1. INTRODUCTION

It is vital to have a good fish pond for better fish production to grow fish. A fish pond is just an artificial structure or habitat that fits the criteria for fish growth.

Although there are many different types of fish ponds, the followings are the most common elements and constructions found in fish ponds:

1. The pipes or channels that bring water into and out of the ponds are inlet/outlet pipes or channels.
2. Pond walls or dikes hold in water.
3. Water controls regulate the amount of water in the pond, the flow through it, or both. 4. There are tracks and lanes along the pond for convenient access to the pond wall.
4. There are harvesting facilities and other equipment for the management of water and fish.

2. PROBLEM STATEMENT

A normal earthen fish pond should be around 300 square meters in size and much larger. However, having multiple small ponds instead of one large pond allows for more frequent harvesting. Small ponds are more expensive to build and occupy a lot of space. On the other hand, large ponds take longer to fill and drain and are more complex to manage. The physical characteristics of a pond usually directly impact the amounts of production and returns that can be achieved.

3. METHOD

The students are required to make a model of a fish pond using recycled materials such as cardboard, box, plastic bottle, straw, plasticine, and other relevant materials and the fish pond model using basic equipments and features to accomplish this project are:

I. Paddlewheel
II. Water inlet
III. Water outlet
IV. Overflow pipe
V. Water level
VI. Dikes/pond walls

However, with the basic guideline and assistance from the lecturer, the students put their effort into an additional feature of the fish pond model, such as filter pump decorations to add more value to their fish pond model.

4. RESULT & DISCUSSION

Figures 1 and 2 below show the model of Mini Aquaculture Fish Pond Design based on different side views.

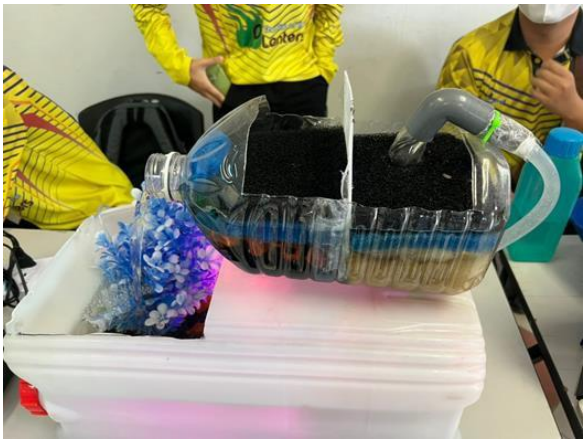

Figure 1. Front-view of Mini Aquaculture Fish Pond Design.

Figure 2. Side-view of Mini Aquaculture Fish Pond Design.

CONCLUSION

In conclusion, a pond must hold water and maintain optimal production conditions. In addition, one should do the necessary pond maintenance tasks (such as harvesting and feeding) with relative simplicity and safety. As a result, poorly designed ponds produce lower yields and returns. This is because comparable yields necessitate higher management efforts and costs. The first step to successful pond production is to pay attention to pond design and construction detail.

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DIY NUTRIENT FILM TECHNIQUE (NFT) AQUAPONIC SYSTEM

Nur Aziemah Jasni[1], Rozlianah Fitri Said[1], Jasmira Jabridin[1], Forney Felix Marcus[1] & Mohammad Haiqal Hassan[1]

[1]*Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA Sabah Branch, Malaysia*

Corresponding author e-mail: aziemah856@uitm.edu.my

ABSTRACT

Malaysia's total population in the year 2021 was 33.45 million, and the need for food production is elevated to feed the nation's mouth. However, Malaysia is currently faced with land scarcity for the agricultural sector and food insecurity. Malaysian agriculture sector competes with other sectors for land, such as industrialization and housing projects. This situation might affect food production for human consumption and contribute to an undernourished issue. Malaysia's land scarcity issues lead to low food production, creating food insecurity and undernourishment. In addition, the COVID-19 pandemic left a tremendous impact on the lower-income group, especially in their food bills. Therefore, aquaponics' soil-less culture technology is a right-thinking way to mitigate listed issues. Plants and fish grow together in one system without soil and less water, limited use of space, source of side income, and produce fresh food from the farm to your table. This study focuses on soil-less agriculture, which is the aquaponic system. This project aims to set up a DIY NFT Aquaponic system and identify the growth of fish and vegetables in different aquaponic treatments. The project was conducted at Unit Ladang, UiTM Sabah Branch, from 10 December 2021 until 28 January 2022. This project uses Tilapia fish and mustard to complete one unit of an aquaponic system. The results show treatments 2 and 3 have decent plant growth and fish development compared to treatment 1. In conclusion, aquaponics can alleviate land scarcity, food insecurity and poverty as it can produce fresh food plus generate income.

Keywords: land, scarcity, food, insecurity, aquaponic.

1. INTRODUCTION

The total world population in the year 2021 was 7,874,965,732 [1] and expected to reach over 9 billion by 2050. Malaysia's total population in the year 2021 was 33.45 million, and the need for food production is elevated to feed the nation's mouth. However, Malaysia is currently faced with land scarcity for the agricultural sector and food insecurity. With the advent of civilization, open field/soil

Based agriculture faces some major challenges; most importantly decreasing per capita land availability and threatening the food production under conventional soil-based agriculture [2]. Thus, the Malaysian agriculture sector competes with other sectors for land, such as industrialization and housing projects. This situation might affect food production for human consumption and contribute to an undernourished issue. According to [3], hunger is rising, with almost 770 million people undernourished in 2020, close to 160 million more than 2014, and 118 million more than 2019. The undernourished issue has increased rapidly in 2019 and 2020 due to COVID-19 pandemic. Hence, modern farming can mitigate agricultural land scarcity and food insecurity issues. Modern farming uses modern technologies, techniques, and science to increase farm production. There are four categories of modern farming: soil-less agriculture, hi-tech mechanization in agriculture, precision agriculture, and Big Data application.

Malaysia's land scarcity issues lead to low food production, creating food insecurity and undernourishment. In addition, the COVID-19 pandemic left a tremendous impact on the lower-income group, especially in their food bills. Therefore, aquaponics' soil-less culture technology is a right thinking to mitigate listed issues. Plants and fish grow together in one system without soil and less

water, limited use of space, source of side income, and produce fresh food from the farm to your table. This study focuses on soil-less agriculture, which is the aquaponic system. The concept of aquaponics is the combination of hydroponic and aquaculture systems. It combines fish and plant farming in a land-based soil-less system. The fish and plants work together to produce efficient, profitable, and sustainable food. Aquaponic is a self-supporting food production system that combines recirculating aquaculture with plant culture without soil (hydroponics). High-volume fish production results in nutrient-rich water that can be used to provide nutrients for plant cultivation [4].

There are three primary growing methods in aquaponic: Nutrient Film Technique (NFT), Ebb and flow, and Raft or Deep Water Culture (DWC) [5]. NFT is the simplest and most straightforward technique used in hydroponics and adaptable to aquaponic. This system exposed plant roots to access water, oxygen, and nutrients. In NFT aquaponics systems, nutrient-rich water is pumped as a very thin film down small enclosed gutters [6]. Plants are placed in a small plastic cup to allow their roots to access the water and absorb the nutrients produced by fish waste. This system is also known as a recirculating system as water is circulated from the fish tank to the plant's cup and returned to the fish tank. The study aims to set up a DIY Nutrient Film Technique Aquaponic system and identify the growth of fish and vegetables in different aquaponic treatments.

2. MATERIAL AND METHOD

This project uses Tilapia fingerling fish and mustard to complete one unit of an aquaponic system. Each aquarium consists of 10 tilapia fish densities and six mustard plants. There are three types of treatment used in this project, as shown in Table 2. Fish were fed two times per day and fertilizer foliar spraying every three days. The fish weight and plant height are collected every week. The project was conducted at Unit Ladang, UiTM Sabah Branch, and the date started on 10 December 2021 until 28 January 2022.

Table 1: Aquaponic Treatment

Treatment 1	Fish without an aquaponic system
Treatment 2	Fish with an aquaponic system, no fertilizer added
Treatment 3	Fish with an aquaponic system, with fertilizer added

3. RESULTS AND DISCUSSION

Data collection for fish weight and plant height started on 20 December 2021 until 17 January 2022. The fish weight and plant height were measured and recorded every week.

3.1 Fish Weight

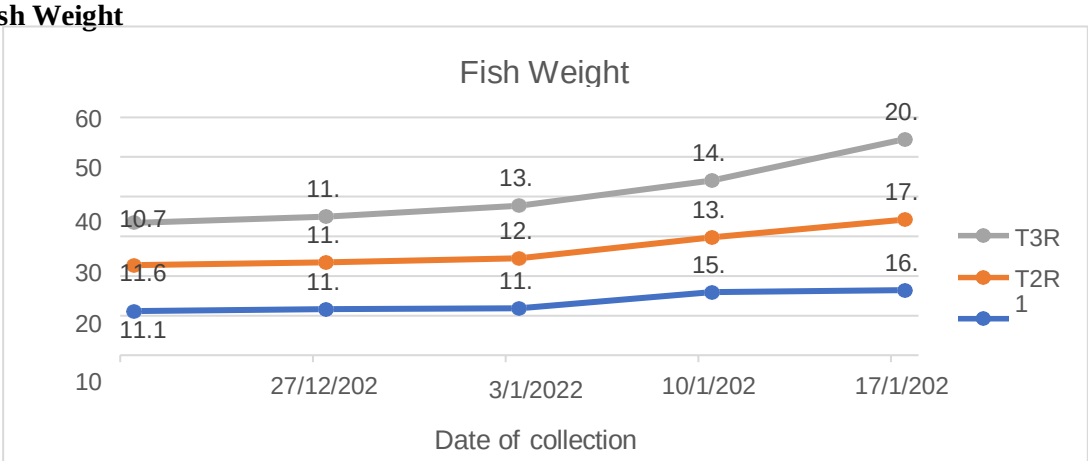

Figure 1: Fish Weight

The graph in figure 1 shows the mean fish weight. The initial mean weight fish for each treatment were 11.1g (T1R1), 11.6g (T2R1), and 10.7g (T3R1). There is gradually an increment in fish weight for each treatment. However, T3R1 shows a higher mean compared to T2R1 and T1R1. The waste urea produced by fish is an additional nutrient source for plant growth. However, there is no relationship between foliar spraying toward fish growth.

3.2 Plant Height

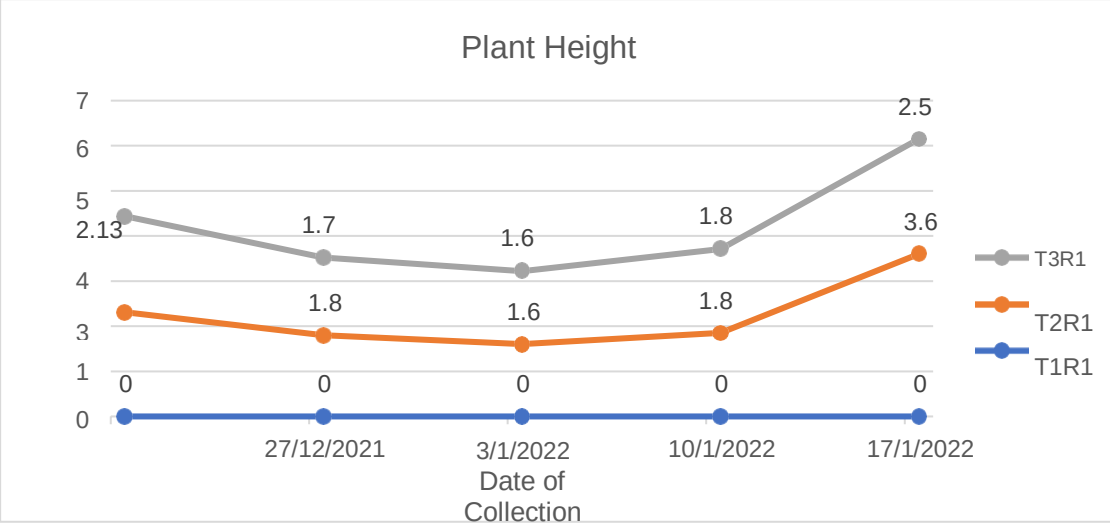

Figure 2: Plant Height

Figure 2 shows the mean plant height for 5 weeks. T1R1 is a treatment without an aquaponic system where only fish were reared in the aquarium without a plant. While T2R1 and T1R1 aquaponic systems were bred fish with a plant. Plant height mean for T3R1 is higher than T2R1 as T3R1 was sprayed with foliar fertilizer. The primary source of the nutrient for aquaponic is from fish waste urea and converted into nitrogen with the help of bacteria. In addition, nitrogen plays an essential role in forming leaf forage which is very useful in photosynthesis [8]. Moreover, T3R1 is added with additional foliar fertilizer to boost plant growth. The prominent role of nitrogen for plants is stimulating overall growth, primarily stems, branches, and leaves [7].

4. CONCLUSION

The present study was accomplished to find a feasible way to produce nutritious food without soil and chemicals. The NFT aquaponics system can have satisfactory fish weight and plant growth for home consumption. Therefore, fresh food is created from the farm to the table. Lastly, this NFT aquaponics system can generate side income for the cultivator. In conclusion, aquaponics can alleviate land scarcity, food insecurity, and poverty by producing fresh food and generating revenue.

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VIRTUAL ONLINE LABORATORIES

POWTOON PEDAGOGY: EMBRACING LABORATORY PRACTICES TO A VIRTUAL ENVIRONMENT

Jacqueline Joseph[1], Mohd Azizul Adzman Bin Jabi[2], Alciey William Uyo[3], Noel Isaiah Alfred[4]and Elverienna Michelle Jubrin[5]

[1, 2, 3, 4 & 5] *Faculty of Plantation and Agrotechnology, UiTM Cawangan Sabah, Malaysia*

Corresponding author e-mail: jacqueline@uitm.edu.my

ABSTRACT

PowToon undeniably has an enticing prospect in pedagogical methods. Nonetheless, its persuasiveness in online laboratory teaching and learning delivery is yet to be explored thoroughly by educators. This paper explores the application of PowToon on providing online instructional laboratory practices and assessments on students' return assignments in the form of digital laboratory reports. An animated whiteboard video feature in PowToon is applied to perform the digital content for the instructional laboratory safety guidelines and a step-by-step process of a laboratory experiment. A qualitative descriptive method was used in this study, in which four students were chosen purposively as the study sample. The data were collected using a simple set of questionnaires using the Google Form platform. The majority of the respondents favoured PowToon to be used in an online laboratory and preferred a digital laboratory report as a return assignment. It is highly envisaging that the critical contribution of this study is the solution it provides to address the use of PowToon in the transition of conducting practical works in the traditional laboratory work setting to a technology-enhanced creativity online platform.

Keywords: PowToon, laboratory, online learning, pedagogy, report assessment

1. INTRODUCTION

COVID-19 era has shaped the pedagogical methods into a new normal practice in the education system. It is noteworthy that the education system is experiencing a sudden transition from conventional learning to blended and e-learning. Academicians and students are slowly embracing information technology integration in education and asynchronous learning. In the post-COVID-19 period, a practical method must be integrated into online learning mode without disregarding the valuable hands-on exposure to such facilities and instruments in the laboratory. Hence, it is crucial to assess how universities are currently implementing online lab-based practical experiments to students in the post-COVID-19 period, to achieve learning outcomes while maintaining a high-quality educational experience. Interestingly, PowToon is unarguably a powerful tool in the e-learning platform. Its unique feature is an animated video maker, making it one of the educators' significant surges in usage, and supported by a previous study [1] corroborate that the interactive features in PowToon allowed students to improve their pronunciation.

None of the previous studies has evaluated the application of PowToon in addressing the strengths and limitations that arise in performing online instructional laboratory practices and in the making of digital laboratory reports. Most of the studies only address the advantages of PowToon in learning English in elementary school [1-2, 4-5] and social science [3]. Therefore, to fill the gap, this study would like to investigate the feasibility of PowToon as an e-learning platform in instructional laboratory practices and demonstrate its potential as an assessment tool for students' digital laboratory reports in tertiary education.

2. MATERIAL AND METHOD

2.1PowToon Animated Whiteboard Video

2.1.1 Laboratory Safety Guidelines and Demonstration of Laboratory Experiments

We used an animated whiteboard video in PowToon as a narrator to briefly explain the instructions on laboratory safety guidelines. First, students performed a video shooting on safety precautions by addressing the 'do's' and 'don'ts' in the laboratory. Students also conducted a simulation on the step-by-step process of a laboratory experiment through video shooting (Figure 2 (A)). The video highlighted the basic use of a compound microscope and the correct technique to observe specimens. Next, all the shooting videos were edited and embedded in the PowToon whiteboard video. Short scripts were designed by the instructor with the help of the students and narrated by the animated whiteboard video corresponding to the shooting videos.

2.2Submission and Assessment of Laboratory Report

All the inputs from the shooting videos throughout the laboratory session, including the video recording on the specimen observation using a microscope, were integrated into the PowToon whiteboard video. Students then created digital laboratory reports outlining the introduction, objectives, methods, results, discussion, conclusion, and references (Figure 2 (B)). The submission can be made in the form of MP4 and YouTube to the respective lecturer. The lecturer will be evaluating and giving assessment marks based on the designated rubric, which includes the originality of the e-contents, experimental skills, peer collaborations in the video, and creativity.

2.3Students' Perception and Feedback

A qualitative descriptive method was used in this study, in which four students were chosen purposively as the study sample. The data were collected using a simple set of questionnaires using the Google Form platform as soon as they had created the digital e-content from the PowToon. Their responses were saved to Google Sheet and used to evaluate the application of PowToon as a learning and assessment tool in this study.

3. RESULTS AND DISCUSSION

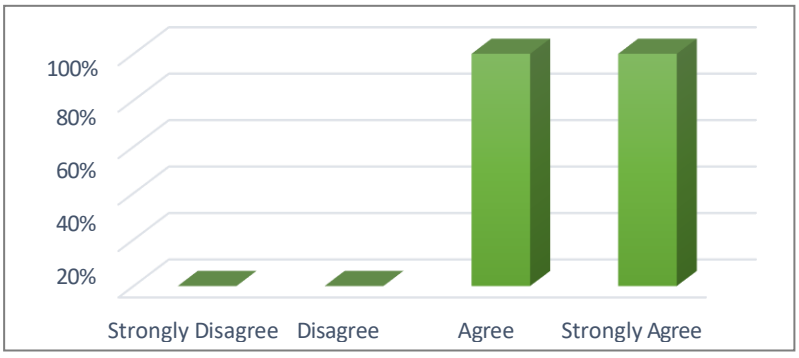
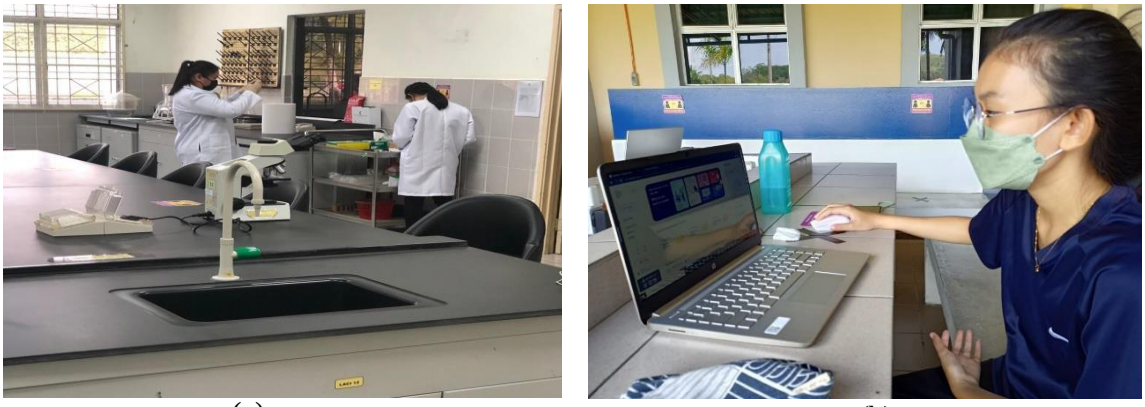


Figure 1: Feedback of Respondents Agreed to Digital Laboratory Reports as Return Assignment

As summarized in Table 2, the main cause of partial familiarity with PowToon application amongst the students could be due to major exposure to the excessive application of typical digital platforms such as Google Meet, Edmodo, Zoom, and Cisco Webex, which may hinder the creativity of the students to engage in the active learning platform. Apparently, it is about time for educators to deploy an effective teaching mechanism that could promote and stimulate interactive learning for students. This is also one of the preparations for Education 4.0, which is derived from Industrial Revolution 4. As COVID-19 still poses threat to global health due to the possibility of more worrisome variants, the open-distance learning (ODL) is still ongoing as a safety measure. Hence, it is crucial to get ready with a rigid plan.



(a) (b)

Figure 2: (a) Video Shooting for Laboratory Experiment Simulation; (b) Students Composing a Digital Laboratory Report using the PowToon Animated Software

Table 2: Summary of Student's Feedback

Indicator	Feedback
Degree of familiarity with PowToon application	All of the students were partially familiar with the application of PowToon application
The best feature of the PowToon application in the virtual online laboratory experiment	All of the students were agreed that PowToon need to apply in an online laboratory with the following justifications; • The animated video makes the learning process easy to understand • It is an ideal tool for creating a video presentation with engaging contents • Interactive features that help for information processing • Help to reinforce motivation in learning activities
Preferences on PowToon to be integrated into a virtual online laboratory experiment	All of the students agreed that PowToon should integrate into a virtual online laboratory experiment
Preferences on laboratory report in digital form using PowToon digital content	All of the students preferred a laboratory report in digital form using PowToon

As depicted in Figure 1, the received responses are overwhelming. The students provided dominant answers and positive perceptions that laboratory reports should be digitalised. This result agrees with the study [6] that formative assessment, which includes making digital laboratory reports via PowToon, can address the teaching and learning's strengths, weaknesses, and efficacy. Creating a digital lab report to fulfill formative assignments will allow students to be more creative in creating expository and persuasive e-content [6], grasp instructions accordingly, and be proactive in task executions. Students were motivated and keen to explore the audio, attractive template, and animation in PowToon [7]. As conventional laboratory reports are burdensome, composing digital lab reports using the e-content from PowToon is perceived as the other alternative for the students in the pandemic era. Making a conventional laboratory report from scratch is not a cup of tea for students. They do not enjoy doing a laboratory report while the other assignments from the other lecturers are piling up. The scenario will result in less motivation and lead to late submission of the laboratory report, or the worst the case scenario is poor execution of laboratory reports.

The application of PowToon also makes the lecturers' task easier to build e-content for their lecture. By providing an animated video from PowToon, which highlights the simulation of safety guidelines and a step-by-step of conducting laboratory experiments, students could get a clear picture of what to do next despite being unable to attend the laboratory physically. The digital content of PowToon can be saved and used in future classes. It could be used for the upcoming semesters, subject to changes. With a designated PowToon assessment rubric, it is effortless for the lecturers to assess the student's digital laboratory report. During the pandemic, lecturers face difficulties conducting face-to-face laboratory experiments and somehow postpone the lab session and resort to drastic assessment by merely asking students to watch any relevant YouTube video for their laboratory experiment.

This investigation, however, disregards the drawbacks of the PowToon as students are still not able to experience hands-on practice in the laboratory work setting. Preparing a digital lab report could be troublesome as it demands an internet connection and limited access to Pro features in PowToon [7]. Lecturers may find it task-demanding as they need to prepare from scratch and learn to explore PowToon. Instead, they use Google Meet, Skype, Edmodo as one-way interaction with students and are not willing to invest their time to establish an interactive e-learning platform. Nevertheless, lecturers need to know how to diversify and spice up the teaching and learning atmosphere using the PowToon application. Indeed, this newly proposed mechanism requires the lecturer's strong commitment, dedication, and passion for initiating enjoyable teaching and learning culture.

4. CONCLUSION

Based on this study, it can be concluded that the key contribution of this study is the solution it provides to address the use of PowToon in the transition of conducting practical works in the traditional laboratory work setting to a technology-enhanced creativity online platform.

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ScanF- CD (SCIENCE CHROMATOGRAPHY ART AND DESIGN FICTION ON FILTER PAPER- CHROMDECO)

Nurul Syahadah Kamal, Muhammad Amirullah Aripin, Zuhairie Zainol, Mohammad Johaiwisah Ab Sah, Jemat Julaihi @ Basri

Universiti Teknologi MARA (UiTM) Sabah Branch Tawau Campus, Sabah, Malaysia

Corresponding author email: jemat880@uitm.edu.my

ABSTRACT

Chromatography techniques are based on including column, thin layer, and paper chromatography. They are not only associated with scientific experiments but also become artworks. In this innovation project, filter paper is used because it has high solvent absorption. It is used to ensure the accuracy of the motifs produced and will be dried in a certain period to produce an interesting combination of art colours and fictional designs. The main objective of the ScanF- CD (Science Chromatography Art and Design Fiction on Filter Paper -ChromDeco) innovation project is to highlight the results of art and design fiction motifs, which are produced through chromatography techniques using filter paper. The novelty is divided into three, first, the results of chromatography between the absorption and separation of the pigments to colour will combine two types of solutes, namely mobilizing agent and colour agents. Next, the resulting motifs are then taken digitally to be composed using Picasa computer software. Lastly, the end product will be produced using art and fiction design of filter paper chromatography, which are; hanging decoration, bookmark, stationery cup, wall decoration, and picture frame on the market. Permanent agent is used in 12.5cm ashless filter paper brand double rings. Colour agent is used as a soluble material that can be purchased in the market. In conclusion, we have learned a lot from this project, for example, the chromatography techniques by using filter paper to produce some art and design fiction motifs.

Keywords: Chromatography technique, art and design fiction, filter paper, end product

1. INTRODUCTION

Paper chromatography technique is one of the colour pigment separation techniques on filter paper [1]. In this innovation project, filter paper is used because it has high solvent absorption. For example, black colour can be separated into primary colour pigments (yellow, blue and red) and secondary colours (purple, green and orange). Patterns in science fiction are drawn using colour markers on filter paper. Then the filter paper is placed on a container containing a cone-shaped filter paper soaked in water. After a few minutes, the resulting colour pigment will be left to dry for a certain period to produce an interesting combination of patterns and colours. The combination of various colours produced through chromatographic techniques can be composed to produce interesting science friction motifs with Picasa computer software. The design of the end product has commercial value in materials such as wallpaper, gift wrapping interior, home decor, bookmarks, textiles and picture frames. The centered design will also be able to provide contemporary techniques in the interior decoration industry.

2. MATERIAL AND METHOD

This research employed the design fiction motifs which were produced through a chromatography technique using filter paper. This method is based on the principle of separation or purification by chromatography which is based on differential adsorption on adsorbent [2]. In this innovation project,

we required materials to produce chromatography such as filter paper (12.5 cm ashless double rings), coloured pen, solvent i.e., distilled water and 50 ml beaker. In this project we used a filter paper (12.5 cm ashless double rings) because it ensures the accuracy for the motifs produced and dried in a certain period to produce an interesting design after a combination of art colours and fictional designs are formed and also has a high solvent absorption [3]. The results of chromatography between the absorption and separation of the pigments will combine two types of solutes namely mobilizing agent and colour agents. To prepare a variety of chromatographic patterns, first of all using a mobilizing agent which was placed in a container in a predetermined quantity for a certain period of time to ensure the distance or the result of the process of separation of pigments against colours can be produced. Afterwards, a permanent agent was used in the 12.5cm ashless filter paper brand, Double Rings. The selection of this type of paper is important because the length factor of the paper is relative to the solute material to be separated through the separation speed against the colour pigment formed. In the last step, a colour agent was used as a soluble material that can be purchased in the market. The process of drawing point plots on filter paper was done through experimentation in repeated quantities. Finally, the selection of point plot drawing will be selected to get the appropriate motif. The combination of various colours produced through chromatographic techniques will be digitalised to be composed using Picasa computer Software.

3. RESULTS AND DISCUSSION

The results obtained show an interesting combination of art and design fictional chromatography. How's separation produced? The preparation of chromatography techniques starts with patterns drawn randomly on filter paper using coloured pens to produce a variety of art forms and fictional designs. Then the pattern-drawn filter paper will be placed on the cone-shaped filter paper soaked in water in a beaker. Approximately 30 minutes to 1 hour later, the resulting colour pigments are left dried to produce an interesting combination of art and design motifs. After that, the combination of colour pigments will form a variety of art and fiction designs through filter paper chromatography techniques. After the combination, the resulting art motifs and fictional designs are then digitalised. The designs will be combined and composed using Picasa computer Software. Eventually, the end product will be produced using art and design fiction motifs such as wallpaper, home decor, bookmarks, textile patterns, picture frames, etc. The centered design will be able to provide contemporary techniques in the interior decoration industry.

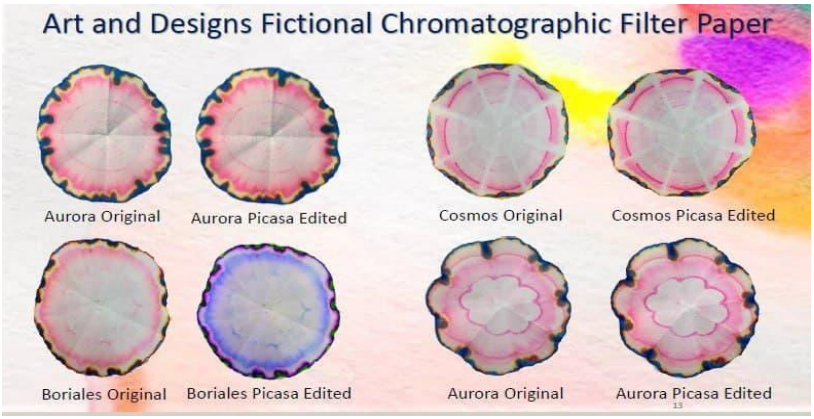

Figure 1. The result of the art and design fictions filter paper chromatography that has been modified using the Picasa computer application

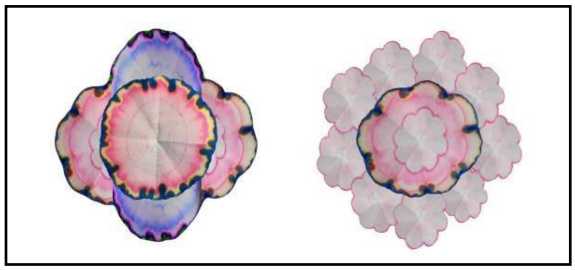

Figure 2. The result of the art and design fictions filter paper chromatography that has been modified using the Picasa computer application

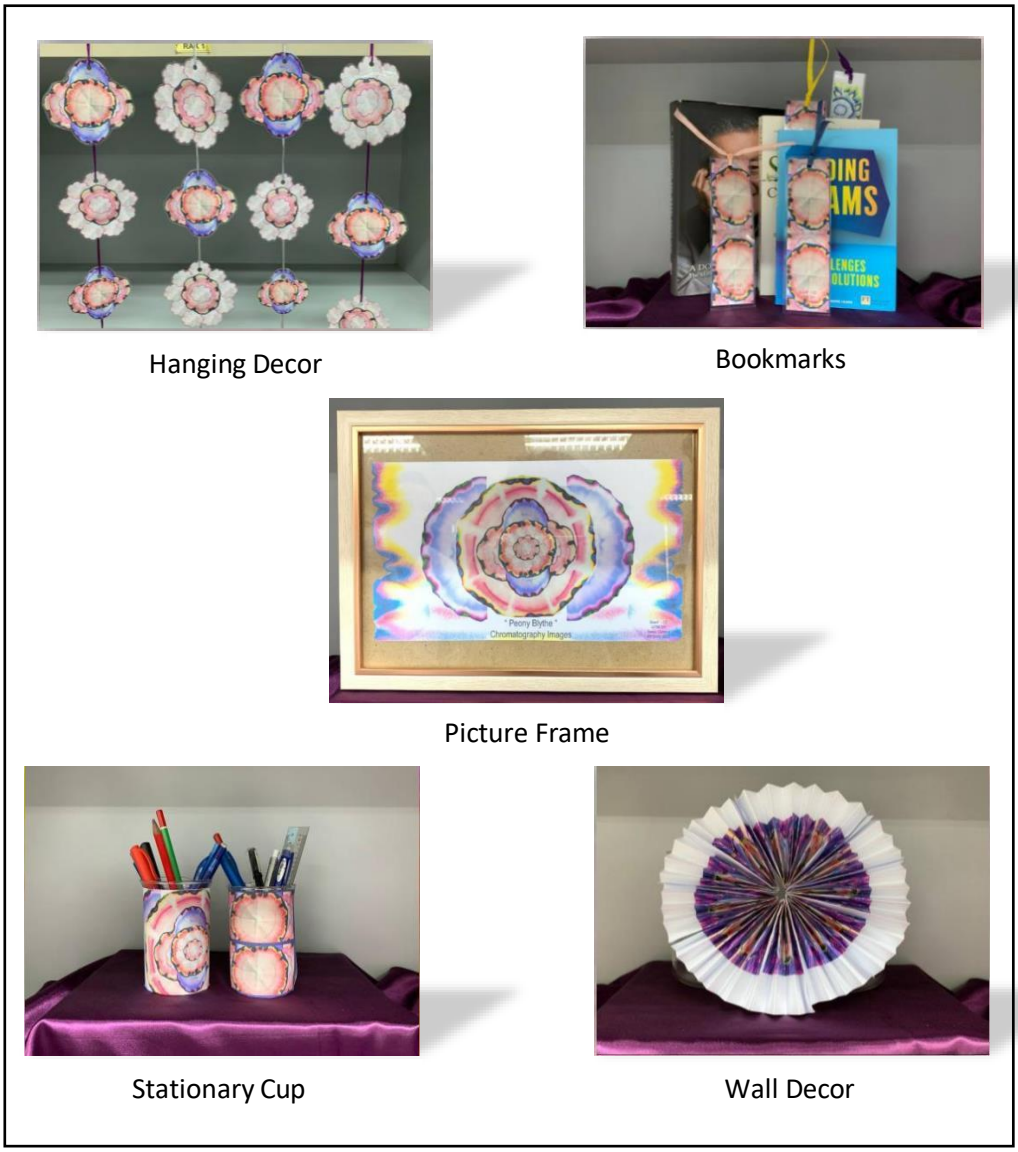

Figure 3. The several end products produced using art design and fiction chromatography filter paper

4. CONCLUSION

In a nutshell, we have learned a lot from this project, namely ScanF- CD (Science Chromatography Art and Design Fiction on Filter Paper – ChromDeco). One of them is that we have learned about chromatography techniques by using filter paper to produce some art and design fiction motifs. In this innovation project, filter paper is used because it has high solvent absorption. There are a lot of benefits to be gained from this project. First and foremost, we are able to improve public understanding of chromatography. For example, the chromatography techniques are not only associated with scientific experiments but it can be made into a work of art. Besides, we are able to create the end products based on art and design fiction chromatographic filter paper on the market. These products that have been produced are hanging decoration, bookmark, stationery cup, wall decoration, and picture frame. Moreover, the end products can be sold in the market or through social media such as Instagram, WhatsApp or Facebook by promoting those designs to attract the public. This design will be able to appeal to everyone in the arts and science to gain new knowledge.

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