



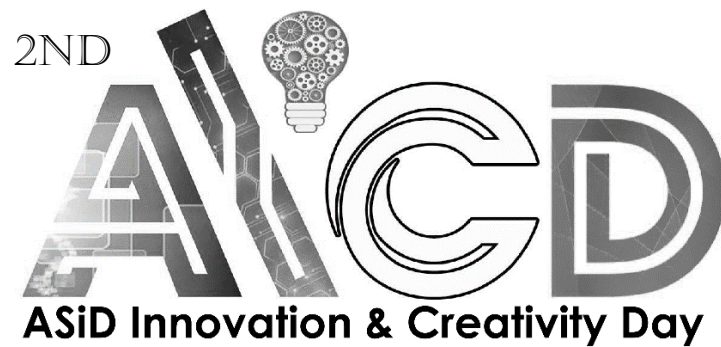
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MARA

Pusat
Asasi UiTM

2nd ASiD **Innovation & Creativity Day (AICD2019)**

Proceeding Book

July 26-27, 2019
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PROCEEDING BOOK

Editor:

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2ND ASiD INNOVATION & CREATIVITY DAY (AICD2019): PROCEEDING BOOK/

Editor Megat Mohd Izhar Sapeli / Nurul Filzah Ghazali / Siti Rudhziah Che Balian / Mohd Norazri Mohamad Zaini / Saleha Md Salleh

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FOREWORD BY DIRECTOR



Alhamdulillah, praise be to Allah SWT, with His permission I can deliver my word in this ASiD Innovation and Creativity Day (AICD) 2019 Proceeding Book themed "Creative and Innovative Technopreneur".

The selection of the theme - Creative and Innovative Technopreneur is aligned with one of the essence of the mission and goal of the university which is to ensure that UiTM products are globally accepted through quality and innovative teaching programs that meet the needs of the market and clients. It is not only focusing on services but also producing creative innovation products of the participants' creative ideas that can be featured in marketing to benefit the community.

Hence, in this ever-expanding technological world, it provides opportunities for all communities, especially educators and students to remain competitive. The emphasis on culture and the creation of new methods of creative and innovative teaching and learning is crucial in facing the challenge of the 4th industrial revolution in this era of 21st century. I am confident and optimistic that through the organization of AICD 2019, it will enhance positive interests and attitudes towards science and technology among the staff of Centre of Foundation Studies UiTM by developing scientific skills and thinking, critical thinking, creativity and innovative ideas that will further drive world-class education.

Finally, I hope AICD program will continue in the future and be fully utilized by all participants in an effort to achieve excellence from all aspects holistically. Congratulations to the organizing committee for a dedicated effort and dedication in organizing the AICD 2019.

Thank you.

PROFESSOR DR. SAIFOLLAH BIN ABDULLAH

Director

Centre of Foundation Studies

Universiti Teknologi MARA (UiTM) Cawangan Selangor

Dengkil Campus

FOREWORD BY CHAIRPERSON



Assalamualaikum warahmatullahi wabarakatuh.

This year marks the 2nd year of ASiD Innovation and Creativity Day (AICD2019) and with the theme "Creative and Innovative Technopreneur", it provides a good exposure and platform for Centre of Foundation Studies UiTM staff and students to showcase their ideas and creativity. We are pleased to present the AICD2019 Proceeding Book as its published record.

AICD2019 represents the efforts of many people. We want to express our gratitude to the members of Innovation, Commercialization and Industry Linkages Management Committee as the program organizer who have contributed their utmost effort in making sure AICD2019 a success. Furthermore, we thank the panel of judges from Research Innovation Business Unit (RIBU) UiTM for their commitment and useful insights. We are also grateful to have the industry player from Malaysian Global Innovation & Creativity Centre (MaGIC) as our panel of judges who have given such insightful comments especially on the commercialization aspects. Our appreciation also goes to ITS Interscience, GFP Enterprise and ABA Bookstore for their kind sponsorship. Finally, AICD2019 would not be possible without the excellent ideas from the participants. We thank all the participants for their effort and contributions in AICD2019.

Lastly, we strongly believe with the success of AICD2019, we will receive more positive interests and participation in the coming years. We hope AICD will continue to become a platform in nurturing creative and innovative ideas among the staff and students of Centre of Foundation Studies UiTM.

Thank you.

DR. SITI RUDHZIAH CHE BALIAN

Chairperson

ASiD Innovation and Creativity Day (AICD2019)

SYNOPSIS

In line with the key purpose of tertiary education to generate holistic graduates who can compete globally and be ready to take on challenges, technological development plays a crucial role especially in the era of the Industrial Revolution 4.0 (IR 4.0). Academicians should be dynamic and adapt to various changes, being able to diversify teaching and learning methods via the culture of innovation, creating an immersive experience in the learning process for students. Hence, this event, ASiD Innovation and Creativity Day (AICD) 2019 is aimed to provide a platform and opportunity for the academicians and students unleash their creative potential, skills and innovation. We are pleased to present the AICD2019 Proceeding Book as its published record.



DIY GREYWATER FILTER

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ABSTRACT

DIY Greywater Filter is simple and affordable water filter that can be prepared at home. Replacement of clean water using greywater for watering plant can help to reduce the clean water crisis in Malaysia. Here, we present a model of DIY greywater filter with added material of luffa and coconut husk. The aim of this study is to treat greywater using DIY method for plant irrigation. Materials used as filter media in the preparation of DIY Greywater Filter were gravel, sand, charcoal, coconut husk and luffa. Dye was successfully remove after filtration process from the synthetic greywater sample.

Keywords: DIY (Do it yourself); greywater; filter; coconut husk; luffa.

INTRODUCTION

Water filter to treat greywater has been widely explored. Study DIY Greywater Filter is simple and affordable water filter that can be prepared at home by using luffa and coconut husk as added filter media. Luffa act as a water purifier while coconut husk provide nutrient as fertilizer [1]. In Malaysia, 42% of clean water has been used for flushing toilet and watering garden [2]. Replacement of clean water using greywater for these purpose can help to reduce the clean water crisis in Malaysia. Thus, the aim of this study is to treat greywater using DIY method for plant irrigation. Materials used as filter media in the preparation of DIY Greywater Filter were gravel, sand, charcoal, coconut husk and luffa. As the novelty, this water filter can produce filtrate containing nutrient to be used in watering plant. Several benefits of this water filter are affordable, could minimised the use of clean water in planting and also produce fertiliser. For the future improvement, DIY Greywater Filter could be miniaturised as commercial greywater filter in discharged greywater system.

MATERIALS AND METHOD

DIY Greywater Filter are made from an open bottle filled manually with gravel, sand, charcoal, coconut husk and luffa. Luffa and coconut husk are cut into a small size (less than 1 cm³) while gravel and sand are used as it is. Each filter materials are separated with thin layer of cotton to avoid mixing of the material. The flow of filtration are from the top (inlet) to the bottom (outlet) and the filtrate are collected at the bottom of the setup. The sequence of filter medium are shown in the Figure 1 (a) and filter medium before cut into small size are as in Figure 1 (b) for luffa and 1 (c) for coconut husk.

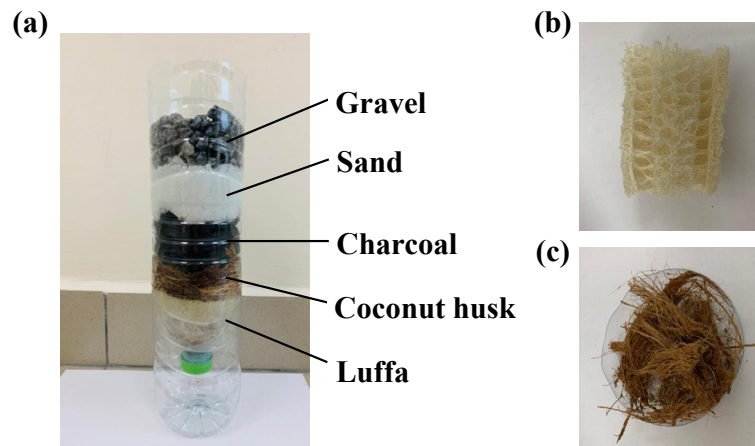


FIGURE 1 (a) The setup of DIY Greywater Filter (b) luffa and (c) coconut husk before cut into small size

RESULT AND DISCUSSION

DIY Greywater Filter was tested using synthetic greywater sample containing black dye, coconut oil and tap water. A change in colour of synthetic greywater was observed from black colour to yellowish colour after the filtration process as in Figure 2.

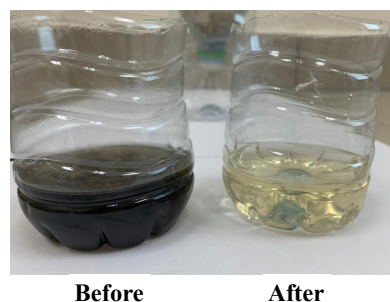


FIGURE 2 Samples of synthetic greywater before and after passing through DIY Greywater Filter

This observation indicates the black dye was adsorbed by the filter media. A study reported by Hasfalina *et. al.* (2015), who measured the adsorption of methylene blue, a common industrial dye, found that the methylene blue was absorbed by coconut husk from the industrial effluent [3]. Some spot of oil was observed remained in the synthetic greywater sample with unquantified amount. The oil was not fully absorbed by the filter medium may due to the leakage of the filter layer result from the unpacked material in the filter layer.

CONCLUSION

DIY greywater filter with added material of luffa and coconut husk has successfully invented. Several benefits of this water filter are affordable, which could minimised the use of clean water in planting and also produce fertiliser. The model shows the filter can remove the dye. However reduce in the amount of oil and increase of nutrient in the water sample was not confirmed. Thus, further studies are suggested to investigate the absorption of oil by the filter

medium and the increase of the nutrient in the water sample. For the future improvement, DIY Greywater Filter could be miniaturised as commercial greywater filter in a discharged greywater system.

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LET'S TALK! APP

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ABSTRACT

This app serves the purpose as a translator in translating commonly used words and phrases into sign language. Using the provided search bar, users may search their desired words to be translated into sign language, or perhaps to be used to discover new signs. With the newly learned signs, users can practice and use them in real life either to spark conversation with the deaf community and/or for other educational purposes.

Keywords: Application; communication; language; educative; disabilities.

INTRODUCTION

Since the establishment of the Malaysian Federation of the Deaf in 1998, the Malaysian Sign Language (BIM) was invented and has been widely used by the deaf society in Malaysia to communicate with others. However, the usage of this language was limited only to the deaf and to those who interact with them daily as there is a lack of medium to learn this language. Consequently, the deaf would have trouble communicating with non-speakers as there is a lack of speakers in the Malaysian community. Thus, the “Let’s Talk!” the app was developed with the purpose to alleviate the language barrier among the native speakers and non-speakers of this language, as well as to invite people to engage in conversations with them despite their disabilities. This app acts as a translator in translating commonly used words and phrases into sign language, thus aiding people to converse effectively to those of hearing-impaired ones.

FUNCTIONS

Search

Using a third-party app called the Yandex Translator , a dedicated linguistic process translating program in the Thunkable app, any language will be translated into the programmed target language. By holding down the "Translate" button, the translated words will be turned into the corresponding Graphics Interchange Format (GIF) which shows the correct sign language of the given word or phrases.

Learn

To cater the enthusiastic learners who are fascinated to learn sign language, learning materials are given to assist the non-native speakers to learn more words and expressions. Essential signs extending from letter sets and numbers to greeting signs that given would offer assistance to allow a little head start in starting conversations with the hard of hearing community.

COMPATIBILITY AND AVAILABILITY

Works well on both Android and IOS. Currently unavailable on both Play Store and App Store since it has yet to be released.

CONCLUSION

Innovation has no other reason than to serve and bring ease to the humankind. With this application, learning and conversing in sign language may have never been simpler. Both sides either the sign dialect native speaker and non-speakers can talk with ease since messages are now not confined by the hard hearing disabilities. The deaf community would now not feel disconnected as the able-bodied can understand them way better as the language boundary are now not pose as an issue.

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DESIGN AND DEVELOPMENT FOR PNEUMATIC LIFT

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ABSTRACT

Pneumatic is the science and technology of using air pressure to transmit force and mechanical energy. A pneumatic lift is one of the more contemporary designs for residential elevators. This type requires minimal installation and fits easily into most homes. Pneumatic statement used extensively in industry are commonly powered by compressed air or compressed inner and other pneumatic devices. A pneumatic system controlled through manual or automatic solenoid valve is selected when it provides a lower cost, more flexible, or safer alternative to electric motors and actuators. This model is based on pneumatic which deal with the study aid application of pressurized air to produce mechanical motion. Pneumatic lift will ease human chores in the kitchen either in a hotel or house. This fabricated model consist of a pre-cut woods, four syringes, a tube and multipurpose glue to complete the pneumatic lift. The objective of this project is to create a pneumatic lift to save energy and environment and also to reduce pollution. It is also to make our daily routine such as cleaning dishes become easier. We don't have to bend our backbone to carry a heavy load. In addition, this system also help to avoid people from injury. After completing this project, we have come to the conclusion that pneumatic lift can easily available to the nature. Moreover, cost of this project is not high compared to hydraulic lift.

Keywords: System; environmental; device; technology; mechanical.

INTRODUCTION

The english word Pneumatic and its associate noun pneumatics are derived from the Greek "pneuma" meaning breath or air. Pneumatic system uses pressurized gases to transmit and control power as the name implies pneumatic systems typically use air as fluid medium because air is safe, low cost and readily available fluid. So, we want to introduce the concept of pneumatic system which can give a lot of benefits to nowadays generation and various Industries.

MATERIALS AND METHOD

Two wooden bars were glued on a plywood base as a stand to attach syringe. Two 10 ml syringe and two 20 ml syringe were fixed with medical pipe so that both syringes will move up and down as pressure is applied on one syringe. 10 ml syringe was glued at the side of stand and thin plywood at the base so that when we press syringe, this base moves up and down as a lift.

RESULT AND DISCUSSION

Pneumatic system is a system that uses compressed air is a vital utility just like water, gas and electrocity used countless ways to benefit daily life. Pneumatic systems are used in controlling train doors, automatic production lines, mechanical clamps. The idea of this project are to develop for the users to lift any weight using air pressure. These systems are compressed gas such as air to perform work processes. Pneumatic systems are open systems. This project is one of advancement in order to introducing the importance and advantages of this system to the public.

CONCLUSION

Pneumatics lifts are used to improve and position work in the kitchen, factory and other places. It is used for load position. This lifter has a pneumatic and safe source for other applications and other hazardous locations. Pneumatics offer a very clean system, suitable for food manufacturing processes and other processes which require no risk of contamination. Thus, this project is one of advancement in order to introduce the importance and advantages of this system to the public.

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POT SUN

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ABSTRACT

Nowadays, many people love gardening and dream of having a small garden to live up the atmosphere in their home. However, more time are needed to maintain and care a garden. Therefore, in this project, an equipment of gardening named POT SUN was developed to make farming/gardening become a valuable hobby for people, especially for those who have limited time and space. POT SUN is a 'compact garden' which contains a plant in a small compartment that is automated by an Arduino. The Arduino is equipped with a moisture sensor that allows it to sense the moisture of the soil and automatically switch on the water pump when the soil is too dry. The enclosure also equipped with an LED that allows the plant to grow continuously throughout the day, thus accelerating the plant growth. It is expected that every house will have POT SUN as an alternative method for gardening. Through this, we can cool down the air surrounding us and decrease the amount of carbon dioxide in the air.

Keywords: Arduino; moisture sensor and smart irrigation.

INTRODUCTION

Gardening or farming is one of the common hobbies. It is can be a great exercise for both the body and the mind. However, more time are needed to maintain and care a garden especially when plants need to be water daily. Hence, a smart irrigation system was developed to overcome the constraint. Smart irrigation system is an effective and efficient way of watering fields [1]. Smart irrigation system was developed by using a low-cost microcontroller board named Arduino [2]. Arduino can be connecting to all kinds sensors, lights, motors and other devices [3].

In this project, an equipment of gardening named POT SUN was developed and automated by an Arduino. POT SUN is a compact gardening kit which is can be a portable garden. Arduino that been used in POT SUN was connected to a soil moisture sensor that allows it monitor the moisture contain in the soil and will automatically adjust the watering schedule.

MATERIALS AND METHOD

Components

The main components used in this project are Arduino uno board, moisture sensor and water pump. Arduino uno board was uploaded with complete coding and act as a brain. It was connected with moisture sensor and water pump. The function of moisture sensor is to detect the moisture content in the soil while the function of water pump is to flow the water into the pot.

RESULT AND DISCUSSION

When the weather is hot and dry, the moisture sensor will detect the low moisture content in the soil. Thus it will notify the arduino to activate the water pump to flow the water from the water tank into the plant pot. The water pump will stop the water flowing when the moisture level of the soil has reached to a desirable level. As a result, daily routine to water plant can be simplified. However, the water content in the water tank still have to be monitored to ensure the water pump can function efficiently.

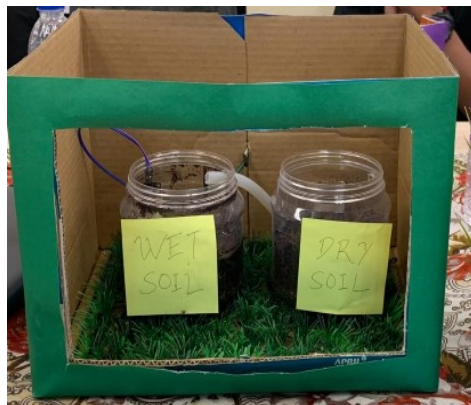


FIGURE 1 Prototype of POT SUN

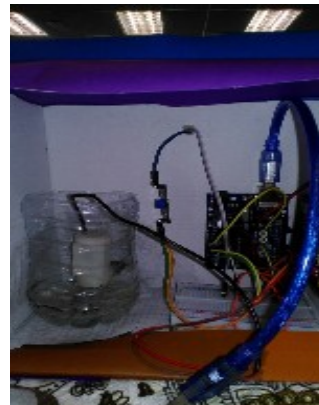


FIGURE 2 Set of Arduino and water pump

CONCLUSION

The gardening kit, POT SUN can be an alternative method for person who want to plant in their house but the space and time gotten to be the constrain. It is expected that every house will have POT SUN as an alternative method for gardening. Through this, we can cool down the air surrounding us and decrease the amount of carbon dioxide in the air.

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‘DE CESSABIT’: THE CALMING NECK PILLOW

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ABSTRACT

Most students experience significant amounts of stress, and this stress can take a significant toll on health, happiness, and grades. Many students feel a sense of needing to relieve stress but with all of the activities and responsibilities that fill a student’s schedule, it’s sometimes difficult to find the time to try new stress relievers to help dissipate that stress. Hence, a neck pillow is innovated to be as a stress reliever beneficial to students and other potential users. This neck pillow is named ‘De Cessabit’ which is a latin word that means the calmness. It is stuffed with rice, cotton wool and essential oils using a sock as its cover. The choices of essential oils available for ‘De Cessabit’ are lavender, roman chamomile and rose. As we all know, inhaling the aromas from the essential oils are known to have potential health benefits for example based on studies, lavender scent is believed to help promote calmness and wellness. This special feature is what makes this neck pillow different from variety of neck pillows available on the existing market.

Keywords: Neck Pillow; innovation; stress reliever; calming effect; essential oils.

INTRODUCTION

College students are prone to experiencing high levels of stress, both short-term and long-term. Transitioning to a new lifestyle, financial concerns, demanding academics, relationships, future career plans and new social opportunities are just a few of the stressor’s college students face. Research reveals that as stress increases, life satisfaction among college students decreases. [1] The World Health Organization (WHO) recognizes aromatherapy as a form of treatment commonly used to relieve pain, improve mood and promote a sense of relaxation and used for anxiety and daily stress problems. [2] Aromatherapy is defined as the therapeutic use of essential oils extracted from plants. Aromatherapy is a popular form of alternative therapy used for a wide variety of ailments, and is especially popular for its non-invasive and accessible nature. [3] The basis of this therapy lies in the essential oils contained in plant materials. These can be found in leaves, flowers, roots, seeds, bark and resin. These oils are highly concentrated and when extracted, can either be used in a pure form or diluted and blended with other oils to produce the required strength. [4] Through aroma inhalation, aromatic molecules pass through the lining of the nasal cavity. These aromatic molecules have the ability to affect the hypothalamus, autonomic nervous system and endocrine system. These molecules can decrease stress, promote blood circulation, regulate heart rate and blood pressure, and improve hormonal coordination. Research also suggests aroma inhalation can reduce the level of perceived burnout and fatigue, both of which are commonly associated with stress. [5] Realizing the effectiveness of aromatherapy in reducing stress, a neck pillow is innovated to be as a stress reliever by adding the aromatherapy essential oils into a self-made neck pillow. Taking the

primary function of this neck pillow which is to reduce stress, this neck pillow is named ‘De Cessabit’, latin words that mean ‘the calmness’.

MATERIALS AND METHOD

The materials used to produce ‘De Cessabit’ is a pair of socks, 2 cups of rice, cotton wools and 25ml of chosen essential oil. The method to produce this neck pillow only consist 4 simple steps, which are very easy and convenient. Firstly, make sure the socks are clean before inserting a cup of rice carefully into both ends of the socks. Next, soak the cotton wools that will be used later with drops of the essential oil and dry it for 10 minutes. The choices of essential oils available for ‘De Cessabit’ are lavender, roman chamomile and rose. Then, fill in the cotton wools into the remaining spaces inside of the socks. Lastly, carefully combine the tip of the socks together and sew it nicely so that the insides would not spill during the usage of the product. After following these 4 steps, you will have the finishing product such in Figure 1.



FIGURE 1 ‘De Cessabit’

RESULT AND DISCUSSION

The neck pillows that are produced are perfectly fine to be used by all generations. This is because the size can be custom made with the size of someone’s neck so that it will perfectly fit and comforting to the users. The materials that are used itself helps in terms of keeping the quality of the neck pillow. For instance, the rice has nice texture and also can help the user by keeping the neck pillow stable on the neck due to the weight of the rice. Plus, cotton wools are soft and can hold the fragrance of the essential oil up to 3 months. The neck pillows are also very flexible and not too rigid in terms of the shape and position. This product is invented to help the community releasing their stress while using the pillow since this pillow is also light in terms of weight and easy to be brought anywhere.

CONCLUSION

It is clearly undeniable that this invention does help a lot of people with handling their stress by inhaling the essential oil that may relax their mind and body during their rest. However, we believe that this product can improve its efficiency if this product is successfully commercialized in the market. If this product is well-received and successfully commercialized, we can provide various types of essential oils in a kit so that the users can continue use the pillow after the fragrance are slowly reducing. A zip will be added so that essential oil can be dropped into the cotton wools easily.

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MOBILE FILTER

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ABSTRACT

Water contains dirt, minerals, chemicals and other impurities that make it smell and taste awful. Contaminated drinking water is one of the leading sources of health problems for travellers, which may cause illness from mild gastrointestinal distress to serious bacterial diseases. Filtering water can help to purify water by removing these impurities which make it safe to drink, while often improving its taste. Based on this principle idea, Mobile Filter is introduced to offer a portable water filter for travelling by ensuring travellers to obtain clean and filtered water wherever they go. This Mobile Filter consists of a clear tube, facial cotton, coffee filter paper, activated carbon, fine sand, pebbles and rubber band. Firstly, to make a functional Mobile Filter, push the facial cotton into the plastic tube. Secondly, rinse the activated charcoal and add it to the tube. Then, add on the pebbles before putting the fine sand. Next, facial cotton is put on top and cap it off with coffee filter paper. Lastly, tie it with a rubber band. Purified water is obtained at the end of the filtering process. Mobile Filter is beneficial to the travellers and those who seek for a portable water filter with a minimal cost.

Keywords: Portable water filter; water purification process; contaminated water; innovation.

INTRODUCTION

The purification of water is very important. Some people are having a hard time to obtain clean water supply. A product named Mobile Filter was inspired from Lifestraw by Swiss-based Vestergaard Frandsen. [1] In Malaysia, Sabah villages are still living without clean water after 10 years. [2] This shows that some rural areas that do not get a clean source of water. This innovation could help them to survive although with the current state of water while waiting for the state water department to manually deliver 50,000 litres of clean water every two days to each village. Few industries have invented a water-filtered base system but there is less invention on a portable and light water filter due to the lack of technology.

MATERIALS AND METHOD

Purification of Contaminated Water

The materials used in developing Mobile Filter are activated charcoal, fine sand, pebbles, facial cotton, coffee filter, a clear tube, conical flask, filter tunnel, and pH strip.

Every material has its own functions in the purification process. Three materials that are important in the process are mainly activated charcoal, fine sand, and pebbles. Activated charcoal is used as the adsorbing agent to create better water quality and it is known to be eco-friendly. It is used to purify liquids and gases in a variety of applications. The fine sand

enhanced the filtering efficiency of sand in capturing very small dirt particles while the pebbles are used as a further treatment to remove pathogens and other small particles to slip through the cracks between sand grains to make it drinkable. [3] These three main materials are considered as the key to purifying water but the other materials are to improve the effectiveness.

The filtering process starts with rinsing the charcoal. This process is to ensure that the activated charcoal has minimal dust and dirt. Then, at the bottom of the clear tube, some coffee filters were placed there. The coffee filter is used to filter small particles in the water and also separating each layer of the three main materials. After that, facial cottons were put at the top of the coffee filter which its function is to filter the remaining big dirt in the water. The rinsed activated charcoals were put at the top of the facial cottons and coffee filters which become the third layer in the tube. Then, the pebbles were put as the second layer and lastly, sand was placed at the first layer in the clear tube. On top of the clear tube, some facial cotton and coffee filter paper has been placed.

To make sure the purification process occurs, the Mobile Filter was put in the conical flask and the filter tunnel was placed at the top of the Mobile Filter. The contaminated water was filled in the filter tunnel and the pH of the filtered water had been tested using the pH strip.

RESULT AND DISCUSSION

The results that had been focused on are the change of colour in the water and the change of pH of the water.

Before the purification process begins, the colour of the contaminated water is brown and cloudy while the pH value of the water is 5 which considered acidic water. After the purification process in the Mobile Filter, the colour of contaminated water turns clear and colourless while the pH value of the water turns into 7 which is considered neutral.

The compilation of these environmentally friendly materials such as activated charcoal, fine sand and pebbles can be an effective filter. This is due to the adsorbent agent in the activated charcoal that helps to purify the contaminated water. The contaminated water is also being purified by the fine sand, pebbles, facial cotton, and coffee filter which allow the big particles to become small particles through the filtration process.

CONCLUSION

Based on the results obtained, it can be concluded that the Mobile Filter helps to purify contaminated water for people to obtain clean water resources. This is because the charcoal is used as the adsorbing agent to filter contaminated water. The Mobile Filter is also lightweight, cost-saving, and portable which makes it convenient to carry around.

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THE MESSING LABYRINTH

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ABSTRACT

This project is one of the advancement in teaching method to cater student interest to learn basic Mathematics which is include the algebraic operation. Through the combination of ‘The Messing Labyrinth’ and the estimate skill, creates a fun learning environment among the students.

Keywords: Learning kit; mathematics; educative; game; interactive.

INTRODUCTION

In research on educational games, the majority of studies have been executed as controlled school settings. The context in which educational games are played, is still underexplored. However, this context is becoming more important, as student are increasingly encouraged or even required to engage with learning content through educational games. The problem is how to develop educational game in scientific learning approach to improve student result. We create a Mathematics game named The Messing Labyrinth, an educational math game targeted at lower form of secondary school students.

MATERIALS AND METHOD

This Mathematics game is a type of puzzle game where a player moves in complex and branches passage to find a particular target or location. All the basic Mathematics operation such as addition, subtraction, multiplication and division are applied in this game. Students need to apply all the knowledge given by the teacher during class session in order to find the solution. This game provided three levels which is beginner, amateur and professional. From the starting place, student need to move the pointer using the magnet provided and try to get the correct answer. In addition, students are not allow to use calculator while playing this game.

RESULT AND DISCUSSION

The finding in this research is student interest in Mathematics after the implementation of mathematical games and recreational activities. Reaction of the subject demonstrated that this game are efficient instructional tools, are fun, remove pressure, encourage peer teaching and non-threatening evaluation of learning. As the objective in this study to improve the quality of learning, we achieved that when the students can estimate the solution of Mathematics problem accurately in a shorter time. Apart from that, the understanding of students in Mathematics increasing especially the basic algebraic operation.

CONCLUSION

The conclusion in this game would prove to be even more succesful at motivating, stimulating and arousing student's interest in Mathematics. This projecct also have its own comercialization poteintal. It will be aninteractive game and learning kit for Mathematics teachers in accordance with PPPM 2015-2025.

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GLAM & GORE KIT

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ABSTRACT

Have anyone ever wondered how does movies that involve injuries, zombies, ghosts, and things like that are created? The answer is pretty simple; makeup. While makeup is often used in films to make actors and actresses look more beautiful, it can also be used to make them look scary, beat-up, or inhuman. Prosthetic makeup (which is also known as special makeup effects and FX prosthesis) is the process of using prosthetic sculpting, moulding and casting techniques to create advanced cosmetic effects. SFX makeup artists use make-up and prosthetics to give performers abrasions, wounds, deformities, bruises, cuts, old age and more. However, FX make ups can be quite expensive and will demotivate those who are interested venturing in this new potential hobby or career path. Hence, to overcome this problem, a complete beginner kit consisting all the make ups needed to create special make-up effects and FX prosthesis is introduced. This cost-effective kit includes a set of brushes, a set of eyeshadows, facial foundation, do-it-yourself fake blood set, face paint, loose powder, glue, cotton wools and sculpting tools. Besides having this splendid kit ease the job for one to create a special effect look, what makes this kit more special is that it comes with hands on tutorial available on the YouTube channel which gives step by step instruction and guidance to make a perfect monstrous, bloodied or evil look. This kit is definitely an investment worthy because it put all the things needed to create special makeup effects and FX prosthesis together in one handy box.

Keywords: Prosthetic makeup; special makeup effects; FX prosthesis; innovation.

INTRODUCTION

Prosthetic makeup (also called Special make-up effects and FX prosthesis) is the process of using prosthetic sculpting, moulding and casting techniques to create advanced cosmetic effects. SFX makeup artists use makeup and prosthetics to give performers abrasions, wounds, deformities, bruises, cuts, old age and more. However, the products utilized by experts in creating such effects are expensive if it is to be used by students or simply those who want to start dabbling in the field of prosthetic or special effect makeups. Therefore, a lot of people are having difficulties in finding the perfect necessities in order to achieve special effect looks. To convey a better option to those who seeks for an alternative, the plan is to create a simplified version of advanced products used by experts hence the emanation of the Glam & Gore kit. This promising kit provides its users with a complete all-in-one tool that brings together all items needed to create realistic special effects makeup. This kit consists of face paint, eyeshadow, foundation, loose powder, glue, fake blood, brushes, cotton wools and sculpting tools. The fundamental idea of the creation of this kit is that to help the consumer to access to all the things needed to create special effects look in one magic box as all of these products will definitely do wonders for those who seek for it.



FIGURE 1 Glam N Gore Kit

MATERIALS AND METHOD

To come out with this kit, the first step is to gather all the products needed (face paint, eyeshadow, foundation, loose powder, glue, fake blood, brushes, cotton wools and sculpting tools) and repackage it into bottles and little containers according to its function. A custom-made box is specially designed to put all of the products perfectly into each specific compartment. The box is super handy as it is portable, has a strap that is detachable and also has a magnetic opening.

RESULTS AND DISCUSSION

Attempts to create several different look and style of special make up on models' face and body parts using this Glam & Gore Kit were made by the students of Pusat Asasi UiTM Dengkil for their project on an innovation competition. By merely using all the products provided in the kit, the students obtained a spectacular result and it had nonetheless, achieved similar outcomes as the professionals. Moreover, videos consisting step-by-step tutorial on how the special effects are done which is the integral part of the kit also gave a significant help to the users in creating the desired outcome.



FIGURE 2 Example of the special effects made by using the Glam & Gore Kit

CONCLUSION

In conclusion, based on the successful try-out and feedbacks received by the users, it is proven that the kit is compatible to be used in creating special effect looks and is likely a better alternative to be used by school and university students as it is a better pick, cost friendly, portable and easy to be used. Depending on the users' creativity and imagination, there is no limit in trying and making special effect looks.

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ARROW MODEL OF VECTORS LEARNING KIT

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ABSTRACT

Resolving vector is a method that resolve vector by its component, horizontal and vertical. The projection of vector along the horizontal is called the x-component of the vector while the projection of vector along the vertical is called the y-component of the vector. These components can be either positive or negative values depends on their directions. They form two sides of a right triangle with hypotenuse that equals to the magnitude of the vector. Teaching and learning vectors is challenging due to the various direction of vectors. Students have major problems with topics vectors especially to resolve vector and determine the resultant of vectors because they do not really understand the concept of resolving vectors. Some students resolve vector without indicate the direction of each component. Topics vectors are important at a foundation level because it is applied to every chapter of physics that involves two dimensions such as motion and force. This vector learning kit consists of board with axis, sample of arrows that represent vectors, play cards, label cards and accessories such as protractor and compass. It also provides an option for a user based on different instruction in the play card. User can play around with the vectors arrow to understand the concept of resolving vector, addition or subtracting vector and resultant vector. This model is found to be an effective method in improving the knowledge of science and engineering students of Centre of Foundation Studies UiTM. It is interesting, easy to learn and very helpful for them to understand vectors.

Keywords: Vectors; resolve; component; arrow model.

INTRODUCTION

In Physics, there are two types of physical quantities. One type is scalar quantity which only has magnitude and the other type is vector quantity which has both magnitude and direction. Force, momentum and torque are the examples of vector quantities[1]. A major problem faced by foundation student in solving vectors are i) drawing wrong triangle[2] ii) resolve vector by its component. Furthermore, students also have difficulties in determining the resultant of vectors because they do not really understand the basic concept of vectors[3]. Some students solve vector problems with correct magnitude but wrong direction either for each component or resultant[4]. Basically, vectors can be added or subtracted geometrically or algebraically. When two vectors \vec{A} and \vec{B} are added, the components of the resultant vector $\vec{C} = \vec{A} + \vec{B}$ are $C_x = A_x + B_x$ and $C_y = A_y + B_y$.

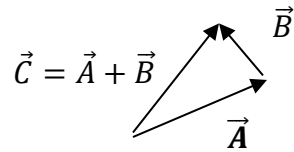


FIGURE 1 A graphical method of adding vectors

MATERIALS AND METHOD

Here we design a board game named arrow model of vectors. It designed as a simple vector's learning kit. It consists of simple board with x and y axis, sample of arrows that represent vectors \vec{A} and \vec{B} , sample of arrows that represent resultant vectors, play cards with instructions, label cards and other accessories such as protractor, compass and ruler. Users are required to pick 5(five) play cards to start playing the games. Each card has different instruction. Users need to follow the step of instruction until the resultant vector is formed. Users can also play around with the vector arrows or start the game again by choosing another play cards with different instruction to understand the concept of resolving vector, addition or subtracting vector and last but not least resultant vector.

RESULT AND DISCUSSION

Based on the model shown, we can verify the result algebraically to determine the magnitude and direction of resultant vector. Here is the sample of calculation of addition two vectors \vec{A} and \vec{B} that can be obtained from the games.

Vector	Component x	Component y
\vec{A}	$A_x = 5 \text{ cm} \cos 45 = 3.5 \text{ cm}$	$A_y = 5 \text{ cm} \sin 45 = 3.5 \text{ cm}$
\vec{B}	$B_x = 10 \text{ cm} \cos 30 = 8.7 \text{ cm}$	$B_y = 10 \text{ cm} \sin 30 = 5.0 \text{ cm}$
$\vec{C} = \vec{A} + \vec{B}$	$C_x = 12.2 \text{ cm}$	$C_y = 8.5 \text{ cm}$

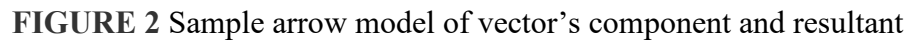
Magnitude of resultant vector

$$C = \sqrt{C_x^2 + C_y^2} = 14.9 \text{ cm}$$

Direction of resultant vector

$$\theta = \tan^{-1} \frac{8.5}{12.2} = 34.9^\circ$$

Thus, it can be compared geometrically by measuring the length of resultant vector \vec{C} to get the magnitude and measuring the angle using protractor to get the direction.



This learning vector kit is very useful especially for lecturer to explain the concept of vectors without drawing the arrow on the whiteboard. It applies in a simple game but interesting and help students improving their knowledge in topic vectors.

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TOTAL INTERNAL REFLECTION (TIR) HANDY-KIT

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ABSTRACT

This total internal reflection (TIR) handy kit is designed as a teaching aid to help the students to visualize the concept and understand the real phenomenon of total internal reflection and critical angle. One of the critical problems is the students are hardly understand and difficult to visualize the concept of total internal reflection in light and optics topic. In order to overcome this problem, we have designed and developed a TIR handy-kit as a teaching aid to help the students to discover total internal reflection and explain the concept of total internal reflection and also critical angle. The TIR handy-kit is portable – make it easy to carry to classroom for demonstration.

Keywords: Total internal reflection; light, handy-kit; critical angle.

INTRODUCTION

Light has a dual nature. In some experiments, it acts like a particle, while in others it acts like a wave. The reflection of light occurs at the boundary between two medium and the refraction (bending) of light occurs as it travels from one medium into another. In reflection, part of the light encountering the second medium bounces off that medium. In refraction, the light passing into the second medium bends through an angle with respect to the normal to the boundary. Always both processes occur at the same time, with part of the light being reflected and part refracted. In this project, the Snell's law of refraction is given by:[1]

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 \quad (1)$$

Total Internal Reflection (TIR) is a phenomenon which occurs only when light is incidence on the boundary of a medium having a lower index of refraction than the medium in which it's traveling. Consider a light beam traveling in different medium where n_1 is greater than n_2 , the refracted rays are bend away from the normal because n_1 is greater than n_2 . At some particular angle of incidence, θ_c called the critical angle, the refracted light ray moves parallel to the boundary so that the refracted angle is 90° from the normal line. For angle of incidence greater than θ_c , the beam is entirely reflected at the boundary, as shown in Figure 1.[2]

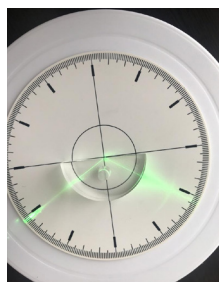


FIGURE 1 The phenomena of TIR

Total internal reflection is used mostly in the optical fibers that carry data at high speed all around the world. Optical fibers can be used in optical communication and in endoscopy.[3] The purpose of doing this handy kit is to help students discover total internal reflection and explain the concept of total internal reflection and also critical angle. Besides, it also helps them to understand the basic concept of reflection, refraction and critical angle.

MATERIALS AND METHOD

This TIR handy kit consists of DIY protractor, semicircular acrylic block, laser pointer and turntable. To obtain the total internal reflection (TIR) by varying the incidence angle, the apparatus were set up as shown in Figure 2. First, turned the turntable until the refracted angle become 90° from the normal line. At the same the incidence angle/critical angle were recorded. Then, the incidence angles were increase in order to get total internal reflection.



FIGURE 2 Experimental kit

RESULT AND DISCUSSION

Critical angle, $\theta_c = 42.1^\circ$

TABLE 1 The angle of total internal reflection (TIR) by varying the incidence angle

Angle of Incidence, θ_i	Observation
30°	Angle of refraction occur at 48.23°
42.1°	Critical angle : angle of refraction = 90°
50°	TIR = angle of reflection = 50°

Table 1 shows the results of of total internal reflection (TIR) which is 50° same as angle of incidence, while the critical angle, θ_c is 42.1° .

CONCLUSION

The developed kit can be used as a total internal reflection set for demonstration in teaching and learning processes as well as experimental kit. This kit is affordable in price and also very handy. With this innovation, teachers will efficiently able to demonstrate the phenomenon of total internal reflection. Thus, it will urge extemporaneity in students understanding.

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HANDS-ON & ADVENTURE OF TWO-SOLUTES MODEL- A PROTOTYPE TEACHING KIT

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ABSTRACT

Learning the process of urine formation were taught in the pre-university level during lectures and lab. Hence a simple hands-on and interactive two solutes-model were designed to help students to gain understanding on how reabsorption of NaCl, water and urea at nephron of the human kidney produces concentrated urine. At the same time, students learned that during the process of producing concentrated urine, the osmolarity gradient of the interstitial fluid from the renal cortex to the renal medulla is maintained due to the involvement of vasa recta. To assess student's understanding, questionnaire survey was carried out on students from Foundation in Science program. Our studies show more than 60% of these students are fully understand two-solute model in kidney after they tried this teaching kit.

Keywords: Two-solute model; reabsorption; concentrated urine; nephron; vasa recta.

INTRODUCTION

Understanding how urine was concentrated in the kidney as a water conserving organ were taught at the pre-university level. In teaching the pre-university students, the difficult part is to make them to understand the concept of how physiology process that occur in kidney produces concentrated urine and at the same time, the osmolarity of the interstitial fluid of the human kidney is maintained.

As the lectures end, students seems fail to appreciate the vital role of the kidneys in maintaining the precise composition of the interstitial fluid from the renal cortex to the renal medulla apart from excreting concentrated urine from the body. Although excretion is an important function of the kidneys, viewing waste elimination as their only physiological role ignores the vital importance of the urinary system for other processes of osmoregulation [2]. Therefore, our team proposing an interactive guided teaching kit which is designed to help students to understand on the process of reabsorption of NaCl, water and urea but at the same time, the osmolarity gradient of the interstitial fluid from the renal cortex to the renal medulla is maintained. The idea of designing the kit is based on the arrangement of juxtamedullary nephron that extended deep into the inner medulla show in Figure 1.

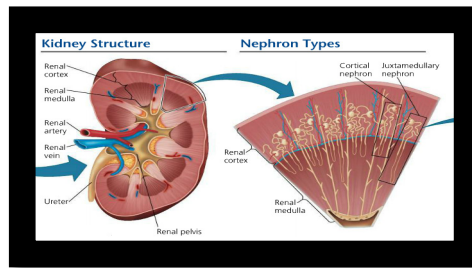


FIGURE 1 Kidney show the juxtamedullary nephron

MATERIALS AND METHOD

In the two-solutes model, NaCl and urea contribute to the osmolarity of the interstitial fluid that lead to reabsorption of water in the kidney and concentrating the urine [1]. The teaching kit acquire involvement of lecturer when the students experiencing the kit. It could be performed as one of the laboratories practical. The teaching kit (Figure 2) were composed of a board that has an imaginary regions of cortex, outer medulla and inner medulla of a kidney with osmolarity gradients. It also has nephron and vasa recta that were labelled accordingly which represent juxtamedullary nephron and blood capillaries. The coloured beads were used as a main teaching tools which represent water, NaCl (Sodium Chloride) and urea. A handbook for students and instructors also were provided in this teaching kit.

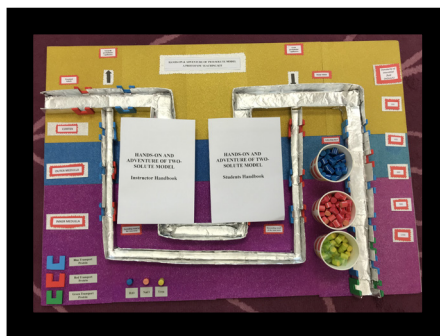


FIGURE 2 Teaching kit of two-solute model

Students experienced for themselves on how the process occurs (by doing the hands-on activity together with their lecturer in the laboratory practical). Survey were conducted to students to assess their understanding level towards this kit.

RESULT AND DISCUSSION

The kit can be further improved (Table 1) its feature for commercialization purpose as the teaching kit teaches students on the concept of two-solutes model and ultrafiltration by nephron in the kidney. Majority of the students agrees that their depth of understanding increase and the kit is easy to be used and attractive.

TABLE 1 Results of the survey

A. Kefahaman kandungan	Setuju (%)	Tidak Setuju (%)
1. Saya telah mempelajari dengan lebih terperinci mengenai konsep 'Two Solute Model' setelah mencuba kit	100	0
2. Kefahaman saya lebih meningkat setelah mencuba kit ini.	100	0
3. Kit ini membantu saya untuk memahami 'Two Solute Model' setelah membaca nota.	100	0
B. Mengenai kit	Setuju (%)	Tidak Setuju (%)
1. Kit mudah digunakan	100	0
2. Arahan mudah difahami	60	40
3. Kit menarik perhatian dan membantu memahami teori yang dipelajari	100	0

CONCLUSION

The kit is user friendly and can enhance student knowledge and level of understanding. Lecturer can use this kit as a teaching kit during laboratory practical session to help their students to understand better on the concept of two-solutes model.

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SUPER FIRE RESISTANCE: PARTY WALL

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ABSTRACT

A study on high alumina plaster showing a potential performance and its can be applied on construction system especially on the element of party wall for terrace or apartment house. Super Fire Resistance: Party Wall was promoted to enhance the requirement from Uniform Building by Law to protect building against fire. The characteristics of alumina material was studied from its physical and mechanical behavior. From the result of study finding that it is a fine material and according to standard consistency, the percentage of water to mix with alumina (10-12%) is lesser than normal cement. According to setting time, set 0.82P for both normal cement and alumina plaster resulting initial setting time for 35 min rather than alumina plaster. This new system especially for separated party wall will improvise from the performance of existing system and towards to sustainable industry.

Keywords: Fire resistance; high alumina material; standard consistency; sustainable material.

INTRODUCTION

Innovation of system by using a material of high alumina as meet its advantage when contacting to heat and temperature [1]. Alumina has its own characteristics which has potential to improve the existing system of building on fire protection.

MATERIALS AND METHOD

High alumina plaster also known as type X9 plaster has been widely used as construction material especially as features and finishing of wall. This X9 plaster also recognize in most factory practice as a refractory material to protect the product material will leaking and flow over from the furnace machine [1]. High alumina was most preferable to be a workability surface material due to furnace temperature.

This high alumina was apart from the construction material, thus the method of study was eligible to testing this material according to cement standard test (such as ASTM C1012). [2]

The selected testing for high alumina plaster consist of standard consistency, setting time, and the plasticity and liquidity test. It is important to determine its workability performance due to material consistency when react with water as a wet ingredients. The fineness of material also can be determined from this types of testings. Method of testing was prepared for 6 numbers

of sampel where is the first sample with standard cement normal consistency P percentage which is 32 percent of water has been added to high alumina plaster. From the result of first sample, the behavior of high alumina was slightly different had been determine which is the penetration standard for cement cannot be achieved. The next sample then introduce by reducing the percentage of water to be mix with the high alumina. From this 6 numbers of sample, the result also verified by finding the high alumina due to its plasticity and liquidity characters using laboratory standard guideline for clay material.

RESULT AND DISCUSSION

TABLE 1 Tabulation of testing data

Origin Moisture Content	Standard Consistency Test	Setting Time Test	Liquid and Plastic Limit
3.43g (9.2%)	34% of normal consistency resulting sampel with lack consistency and more fluidity	From 10% of normal consistency the setting time result for sample will reach penetration depth up to 70 minutes, whereby the standard cement test can reach penetration by only maximum to 35 minutes. Thus sample should be test due to less of water added or contact to certain heat.	Result of testing due to wet sampel can found that 10% of normal consistency was the optimum moisture content, while 19% of sampel will acted as liquid and wet content.
	30% of normal consistency resulting sampel with lack consistency		
	10-12% of normal consistency resulting sampel achieved the qualified penetration depth for material		

TABLE 2 Data of percentage of normal consistency versus depth penetration

% Normal Consistency	34%	32%	10%
Depth Penetrate (mm)			
Normal Cement	38	36	20
High Alumina Cement	0	0	36

The result from this study showing that the high alumina has different characteristics especially on its moisture content which is more behave like plastic material such as clay and plastecizers material. From this character, its potential to high bond with existing material such as cement or concrete mix can be achieved better. This fluidity character also benefit to time hardening which most material need the moisture to keep them strength and more lasting (as the curing process on concrete mould for more than 7 days was so important). This material character on

its consistency due to lower percentage exhibit with setting time duration more than 35 minutes. This is showing that the high alumina can perform with less of water added, while its setting time to dry and penetrate take a hours to find its final set due to room temperature. This preliminary result is showing that the high alumina has high potential to keep its moisture content if contact to high temperature.

CONCLUSION

From this finding of study can be conclude:

1. High Alumina cement has reach its standard consistency with optimum percentage of 10 percent of its moisture character, thus from 0.82P had resulting its setting time more than 35 minutes which longer than normal cement.
2. High Alumina also behave as plastic material which is having plastic strength within 10 percent of water, when more than 19 % of water the high alumina will turn to be liquidity material where the strength of material cannot reach better till its dry to keep its consistency.
3. This result also can be further studied by include the suitable testing especially when its contact to temperature. The setting time result showing that its character of plasticity can be extend to certain time in room temperature, this can be as hypothesis that high alumina has its plastic strength within high temperature.

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B.B: INTERACTIVE BUSY VOCAB BOX

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ABSTRACT

A needs analysis survey conducted among the students taking ELC080 in Pusat Asasi, UiTM Dengkil found that one of the primary concerns among them is their lack of vocabulary in English. Although vocabulary acquisition is largely to be deemed self-taught, a suitable method learning is still needed to ensure its success. This is the fundamental idea behind the design of the B.B-Interactive Busy Vocab Box. Using this box, ESL learners can use the given root words and, by using the analogy of a tree and lego building, “grow” their vocabulary by adding prefixes and suffixes. The novelty of the product is that it is a portable, one-of-a-kind interactive box that help ESL learners engage in active learning activities by providing a hands-on experience for the learners. The commercialisation aspect of the product lies in its ability to be appealing for all ages and level of ESL learners. The content of box can easily be tweaked to suit the needs and objectives of its users, be it parents, teachers or the learners themselves.

Keywords: ESL learners; vocabulary building; interactive learning; active learning.

INTRODUCTION

Most language learning modules and materials focus on the other key components of English (e.g. reading, writing, grammar), deeming vocabulary not as important.

However, in terms of assessing English proficiency skill levels using the Common European Framework of Reference for Languages (CEFR), vocabulary size is considered as one the most reliable tools to measure proficiency (Milton, 2013). This demonstrates how important it is to have a sizable vocabulary especially for tertiary learners as their learning materials may require a higher level of English proficiency. Yet a study by Harji, Balakrishnan, Bhar & Letchumanan (2015) on the vocabulary levels of Malaysian undergraduates found that most do not possess the adequate level of vocabulary expected of a university student. In order to address this issue and provide ESL learners with an innovative way to expand their vocabulary, the researchers looked into the root word vocabulary growth method.

MATERIALS AND METHOD

Root Word Vocabulary Growth

In choosing the vocabulary teaching method to be explored, the researchers believe that knowledge on word formation (adding prefix and suffix to root words) can be very helpful for students to expand their vocabulary size. Since most words in English are related in terms of having a common root, Min (2013) notes that learning about affixes (prefix and suffix) can help ESL learners learn a lot of new words. In addition, learners get to guess the meaning of words by connecting it to their existing knowledge on the definitions of the root words.

CEFR Word List

The list of words used for this product is derived from an online database (<https://www.englishprofile.org/wordlists>) which provides a comprehensive list of words based on the levels of CEFR (A1-C2). The researchers then chose suitable words from the A1-A2 levels (beginner), B1-B2 (intermediate) and C1 (advanced) to be used as the root words for the vocabulary growth method.

Interactive Busy Vocab Box

The box consists of two activities for word building which are the Vocab Tree and the Vocab Tower. Both activities require the participants to choose a particular root word, then adding suitable prefix and suffix to it.

The Vocab Tree is meant for beginner to intermediate level learners and is limited to pairing one root word with various suitable prefix and suffix. The Vocab Tower on the other hand, is meant for more advanced level learners as the root words are more challenging and there is an option for using multiple root words at once and connecting these words via shared prefix or suffix.

RESULT AND DISCUSSION

A survey to investigate the feasibility of using the root word vocabulary growth method was conducted using 76 students as the sample and yielded favourable result.

Survey Result

The result from the questionnaire administered during the survey revealed that 48.7% of students prefer to increase their vocabulary using interactive methods. A majority of them agree that learning prefix and suffix can help with vocabulary enhancement. However, only 28.9% gave positive feedback on their ability to identify words with prefix and suffix. In addition, only 26.3% of the respondents are able to form new words by adding prefix and suffix. The lack of knowledge in the use of affixes and the students' interest in learning vocabulary in an interactive way has spurred the researchers to come up with the innovation.

After the respondents have been exposed to the root word expansion method, they were given a set of 14 questions related to the use of affixes to test their knowledge. 78.9% of the respondents were able to get a score of between 10-12 out of a possible 14 marks.

The positive feedback from the survey has proven that the root word vocabulary growth method is beneficial for ESL learners to improve their vocabulary and further enhance their proficiency in the target language.

CONCLUSION

Most adult ESL learners deem vocabulary acquisition as one of the greatest challenges that they have to face when learning English (Green & Meara, 1995). As such, a more comprehensive approach to learning vocabulary needs to be implemented to help the students improve their English proficiency which will then help them to cope with the demands of their tertiary education. Although the preliminary findings from survey could not be generalised, it

is hoped that the B.B: Interactive Busy Vocab Box can be a gateway tool in providing a more interactive and tactile approach to building ESL learners' vocabulary size.

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DETACHABLE KIT: FORCE & TORQUE

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ABSTRACT

Torque concept is hard to understand in class just by reading text meanwhile free body diagram (FBD) is hard to sketch without realizing forces involved on an object. In order to overcome these two situations, a teaching kit called “Detachable Kit: Force & Torque” is created as an aid for students' understanding of those two concept. It consists of two experimental set up which are 1. Free body diagram (FBD) on level and inclined plane using toy car and 2. Balanced of torque using replicate see saw. This kit is low-cost, lightweight and portable, easy to set up, and effective to be used as a teaching kit for educators or hands on activity by students. Sets of questionnaire have been distributed among foundation students. The result shows positive outcomes.

Keywords: Force; torque; free-body diagram; equilibrium.

INTRODUCTION

Physics concepts are always claimed to be difficult to understand by the students [1]. These include the concept of force and torque. Force and torque are around us in our daily life but most of us don't realize these two concepts. Force such as applied force, normal force, frictional force and weight have been introduced in secondary school. In order to indicate these forces, a technique of drawing called the free body diagram (FBD) has been used in the syllabus. However without realizing forces around us thus leads difficulties to the students to sketch the correct FBD for cases such an object lying on level plane as well as inclined plane [2]. In other hand, torque deals with rotation of object as simple as opening and closing the door everyday in our daily routine have been introduced in A level, foundation studies, diploma or STPM level. Balanced torque will cause object to stay stationary while imbalanced torque leads to rotation of the object either clockwise or counter clockwise [3].

MATERIALS AND METHOD

A survey has been carried out on a sample of 50 foundation students (Science & engineering) at Centre of Foundation Studies UiTM Kampus Dengkil in order to get feedbacks regarding their understanding of force and torque concept before and after using this teaching kit. Three sets of questionnaires had been given to the sample. 1. Prior questionnaire testing on force and torque concept before introducing the kit. 2. Extended questionnaire testing on same concepts with extended details after the sample being introduced with the kit. Final questionnaire was the general opinion on overall experience using the “Detachable Kit: Force & Torque”. The data obtained are tabulated as bar charts in result and discussion part.

RESULT AND DISCUSSION

Figure 1 shows highest percentage of understanding the concept of force & torque concentrated at region of “medium” (38%) prior (blue) before this teaching kit has been introduced to the students. It is clearly seen that the percentage of understanding the concept of force and torque has increased and concentrated towards the region of “good” (36%) & “very good” (42%) after (red) this kit has been introduced to the students. The concepts tested are about the free body diagram (FBD) of object on level plane and inclined plane together with the balanced and imbalanced of torque.

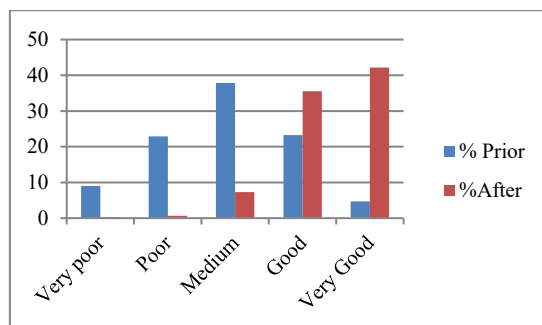


FIGURE 1 Students feedback regarding the concept of force & torque

Figure 2 shows most of the students agreed that this teaching kit is interesting and interactive in visualizing force & torque concept. Students also agreed that it is easy to set up (assemble & dismantle). Moreover, students also agree that by using “Detacable Kit: Force & Torque” as an aid to teaching & learning improve their understanding of these two concepts, force & torque.

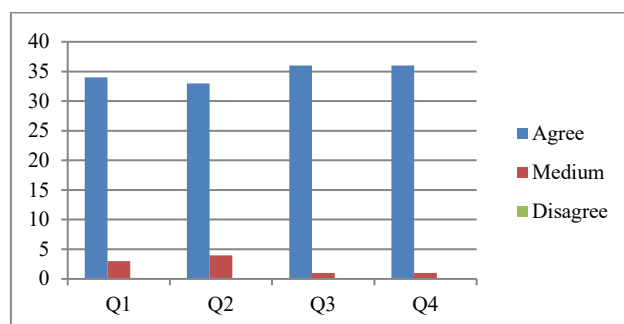


FIGURE 2 Students feedback regarding “Detachable kit: Force & Torque”

CONCLUSION

In conclusion, this teaching kit called the “Detachable Kit : Force & Torque” has improved the understanding of a portion of foundation students on free body diagram (FBD) and also balanced of torque as well as imbalanced of torque concepts.

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LITERATURE REVIEW TEMPLATE

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ABSTRACT

Literature Review is a section, a chapter of a research report which explicates, describes and presents critically evaluated theories and concepts that underlie an area of study that is being undertaken by a researcher. Critical evaluation of the theories include comparing and contrasting, matching and piecing together aspects of previous studies that form the basis for the study at hand. In this, concepts and theories can be seen to evolve; affirmed, improved, altered, modified or rejected. In terms of language skills, writing a literature review requires the knowledge of synthesising skills which are taught as part of writing classes but not within research report writing domain. Hence, it is not surprising that writing literature review is viewed as a writing skill that is far detached from synthesising skills and it poses a challenge to researchers.

Keywords: Synthesising skills; effective literature review; academic writing; reviewing articles.

INTRODUCTION

This research addresses one of the obstacles that impede scholarly writing efforts among young or novice researchers, which is writing effective literature review. Often, literature review is presented as a collection of quotes; direct or paraphrased, in sequence or random, as a form of support to the idea, concept and theory that is being developed by the researcher. The collection can be described simply as, “A said this, B said that and C said this and that”, a write up that is devoid of critical thoughts and analysis by which the scholarly nature of a study is defined. Perhaps, the researchers have not been trained to transfer their synthesising skills acquired in their writing class, in reviewing previously written research reports, hence, depriving themselves of effectively and clearly written review of literature (refer to the succeeding section). Many do know that literature review is a product of effective utilised synthesising skills but they are not familiar with the manner by which or the organisation of the synthesised ideas.

MATERIALS & METHOD

The Project

The team of lecturers specialising in teaching the fundamentals of writing skills have designed a template to be used by young and/or novice researchers who grapple with the idea of writing literature review, an aspect of academic writing which may or may not be taught in their writing course. Hence, this innovation project seeks to create and introduce a template of elements

required for writing effective literature review, to be shared and utilised by the research communities in Malaysia. The idea for this project is being experimented with, with Asasi TESL students in their writing course under the synthesising skills.

RESULT AND DISCUSSION

Literature review is a part of scholarly writing that includes a constructive process of meaning making, not only in recording what the researcher has read but also providing a voice, his/ her voice in agreeing, disagreeing, commenting, identifying and pointing out gaps and flaws in ideas put forward in other scholarly articles and making a stand on how the researcher intends to integrate the ideas from past studies into his/ her own work. At times, he/ she will have to justify his/her choice in rejecting certain ideas which would lead to further studies conducted on the rejected idea(s). This process of writing a scholarly text is defined by Ondrusek (2012) which is a combined description of various researchers' opinion of scholarly writing. According to Ondrusek (2012) Lavelle and Bushrow (2007) perceive scholarly writing as "graduate writing process" and described it as a "constructive process" that students use "to make a meaning that is beyond the sum of words" (p. 808). Torrance, Thomas, and Robinson (1994) characterized academic writing as a "complex combination" of generating and selecting ideas to create a text (p. 379). Aichison and Lee (2006) observed that producing text and producing knowledge can become "complexly intertwined" (p. 266) and called for a model that recognizes writing "as knowledge-creating rather than merely as knowledge-recording" (p. 270) Knopf. (2006) has clearly defined the components of a literature review. According to him, literature review,

“ should concisely summarize the findings or claims that have emerged from prior research efforts on a subject. Second, a literature review should reach a conclusion about how accurate and complete that knowledge is; it should present your considered judgements about what's right, what's wrong, what's inconclusive, and what's missing in the existing literature. In contrast to some other ways of surveying a body of literature, such as an annotated bibliography, the literature review is a work of synthesis. For this reason, it is important not to simply write a summary list of what each individual work says, but in ead to focus on the body of work viewed as a whole”

While this is true of what consists of a literature review, many educators and researchers find that writing literature review is not an easy feat. Some studies have found that “writing literature review can be intimidating and confusing for students”, (Ridney,2008; Feak and Swales;2009) and many do not even know how to define a literature review (Cisco, 2014).

Bolderston (2008) acknowledges the complexities that a researcher would find in writing a literature review, however, she emphasises on the fact that a “ good review can extract new ideas from others' work by synthesising and summarising previous sources...new ideas can be built from the evidence discussed and, and new directions for future research can be suggested...”

Based on the above descriptions of what a literature review entails, it is clear that to be able to write an effective literature review, one has to have acquired synthesising nd summarising skills as a literature review extends far beyond merely reporting what various reserachers have presented in their report.

CONCLUSION

A survey conducted to gauge the need for guidance in the form of a template to write effective literature review, revealed that 90.0% from the total of 20 respondents agree that they need guidance to write literature review and 86.4% would like to try out the template that the team of educators have created.

This gives the researchers the motivation to create the template and a module for the use of students of institutions of higher learning, researchers and educators. This project is expected to have positive implications on the future of research and scholarly writing activities within the academia in the country with particular enhancement on the quality of literature review presented in each study/research.

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GENEPRO LEARNING KIT: BLOOD TYPE

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ABSTRACT

The fundamental laws of inheritance are crucial as they provide the basic idea in understanding how certain traits are inherited from one generation to the next one. GenePro LEARNING KIT was created to visualize the genetic inheritance of blood types in human. Human blood type is one of the immensely studied human traits. Therefore, understanding the basic knowledge of how it is inherited is much required. In extended Mendelian Genetics, human blood type is used as an example of codominance and multiple alleles, however it can be very challenging to teach in classroom using theoretical based approaches. Academicians are facing difficulties to demonstrate the nature of human ABO gene since it involves two copies of chromosome 9. This learning kit is one of advancement in teaching methods to cater students' interest to learn basic concept of blood type inheritance.

Keywords: Mendel; human traits; blood type; learning kit.

INTRODUCTION

Gregor Mendel studied genetic inheritance by experimenting with pea plants. Mendel's Laws of Heredity stated as The Law of Segregation and The Law of Independent Assortment have become the fundamental knowledge for scientists to study the pattern of genetic inheritance in human.

International Society of Blood Transfusion has recently recognized 33 blood group systems. Of all the 33 systems, ABO system remains the most important in blood transfusion and transplantation since a person above the age of 6 months possess significant anti-A and/or anti-B antibodies in the blood serum (Ranadhir et al. 2014). There are three alternative form of genes (called "alleles") of this blood type gene which are A, B, and O. A person's blood type is determined by allele inherited from each parent. In this case, the A, B, and O allele combination of the person that they have as their genotype will depicted their blood type such as type A, B, AB and O as the phenotype. Table I show the genetic basis of blood type in human.

TABLE 1 Genetic basis of blood types in human

Allele from Parent 1	Allele from Parent 2	Genotype of offspring	Blood types of offspring
I^A	I^A	$I^A I^A$	A
I^A	I^B	$I^A I^B$	AB
I^A	i	$I^A i$	A
I^B	I^A	$I^A I^B$	AB
I^B	I^B	$I^B I^B$	B
I^B	i	$I^B i$	B
i	i	ii	O

The ABO blood group locus is located on the long arm of chromosome 9 and has been determined through red cell adenylate kinase (AK-1) assay (Ferguson-Smith et al. 1976). This was later confirmed by linkage analysis (Allderdice et al. 1986).

MATERIALS AND METHOD

The kit consists of chromosome model that carry allele for blood type in accordance to extended Mendelian concept. It can be used by 30 students at one time and suitable to be used in classroom and as laboratory practice.

For example, students have to identify genotypes for a cross between individual with blood type A and blood type B. Individual with blood type A might carry genotype $I^A I^A$ or $I^A i$ meanwhile individual with blood type B might carry genotype $I^B I^B$ or $I^B i$. By using the chromosome-shaped magnets, students are required to arrange the allele according to Mendel's First Law Of Segregation. The chromosome-shaped magnets were designed in two colours, blue and white representing paternal and maternal chromosome respectively. The combination of alleles would produced various sets of genotypes. From this result, students can predict the blood type of future offspring.

RESULT AND DISCUSSION

This GenePro Learning Kit: Blood type has been tested and piloted to 10 academicians and students for its validity and effectiveness in illustration of the blood type genetic concept. Through qualitative view of expert and academician in the field, this kit having high potential to be used in classroom since it's touchable and clearly visualize the concept. The different version of alleles represented by chromosome shapes is well illustrated to show combination of chromosome inheritance concept that comes from both paternal and maternal genes. However, as the kit solely depend on the soft board material to illustrate the chromosome shape, the feasibility of the kit can be improved in the future with high-quality material such as the fiber or plastic to be more practical.

CONCLUSION

This GenePro Learning Kit: Blood type is very useful to both students and educators. This kit visualizes well the phenotypes and genotypes in human blood type genetic, thus potentially can

be used in classroom and laboratory to give more exciting experience to the student in learning the concept. It stimulates hands-on activity concept and fit to the teaching approach in 21st century classroom. This kit can also be applied as a cheaper and economic teaching materials in schools, colleges, and universities to enhance advance learning in genetic field

ACKNOWLEDGEMENT

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A PORTABLE LOW-COST LENZ'S LAW ELECTROMAGNETIC EXPERIMENTAL KIT

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ABSTRACT

This Portable Low-cost Lenz's Law Electromagnetic Induction Experimental Kit is designed as a teaching aid to help the students to visualize the concept and understand the real phenomenon of the direction of induced current flow. One of the critical problems is the students seem very difficult to understand and grab the basic idea of Lenz's law since most of the teachers and lecturers still using the traditional 2-dimensional drawing on the whiteboard and PowerPoint presentation to explain the direction of the induced current produced by the change of magnetic flux in a coil. In order to overcome this problem, we have designed and developed a portable low-cost experimental kit as a teaching aid to help the students to visualize the concept and understand the real phenomenon of the induced current flow. From these observations, it can be concluded that a current is induced in the circuit as long as there is a relative motion between the magnet and the loop. This portable low-cost Lenz's law experimental kit has proved to be effective in classroom teaching and learning processes in the Centre of Foundation Studies UiTM, in which there is a significant improvement on understanding Lenz's law among students.

Keywords: Lenz's Law; induced current; magnetic flux.

INTRODUCTION

Lenz's law is a common way to understand how an electromagnetic circuit obeys Newton's third law and the conservation of energy. Lenz's law can be defined as an induced electromotive force (emf) that always gives rise to a current whose magnetic field opposes the original change in magnetic flux. Based on equation 1, Lenz's law is shown with the negative sign in Faraday's law of induction, indicates that the induced emf (\mathcal{E}) and the change in magnetic flux ($\Delta\Phi_B$) have opposite signs.

$$\mathcal{E} = -N \frac{\Delta\Phi_B}{\Delta t} \quad (1)$$

$$\Phi_B = NBA \cos \theta \quad (2)$$

From equation 2, we know that factors affecting the induced current are number of turns of the coil (N), magnetic field (B), surface area of the coil (A), orientation between magnetic field and surface area (θ) or time produces emf (Δt). (Raymond & Chris, 2012).

Figure 1 shows the direction of induced current with 3 different cases donated as A, B and C. Diagram A shows a condition when magnet bar is not moving, the magnetic flux is not changing and consequently no current is induced. While B, shows that when the north pole of a magnet bar is pushed into a loop, the flux increases. An upwards induced magnetic field is created that opposes the external magnetic field of the magnet. As viewed from above, by using right hand grip rule the induced current in loop must flows counterclockwise in order to create this induced magnetic field. C shows that when the magnet bar is removed from the loop, the decreasing magnetic field in the loop creates a decreasing flux. To oppose these decreases, the current in the loop flows in such a way that tries to sustain the magnetic field. Again, by using right hand grip rule, induced current now must flow clockwise in order to counter acts the decreasing flux due to the with drawl of the magnet. This means that the induced magnetic field should be in the same direction as the external magnetic fields. (Walker, 2013)

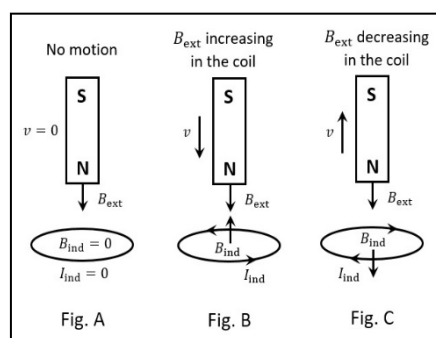


FIGURE 1 Directions of induced current for different cases

The objectives of this experiment are to determine the direction of the induced current based on Lenz's law and to observe the changes in magnitude of induced current by varying number of turns of the coil. This kit is able to spark the students' interest towards electromagnetic induction and enable them to appreciate the concept of Lenz's law.

MATERIALS AND METHOD

The apparatus used in this experiment are ammeter, magnet bar, copper wire, compass, batteries, board and plywood, chopsticks, crocodile clips and wires, potentiometer/rheostat and screw (soft Iron). The apparatus were set up as shown in Figure 2 to determine the direction of the induced current based on Lenz's law. First, the magnet bar was placed near the coil. Then, the magnet bar was slowly moved towards the coil. The direction of the induced current was observed and record when the magnet bar is moving towards, static and moving away from the coil. The same set-up were used to observe the changes in magnitude of induced current by varying number of turns of the coil. First step, replaced the existing coil and two other coils were used with different number of turns. Then, the coil with a larger number of turns was used and the magnet bar moves towards the coil. The observations were recorded and the same steps were repeated by using the coil with a smaller number of turns.

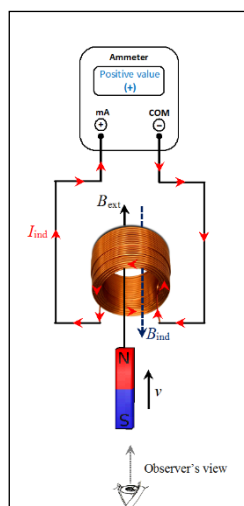


FIGURE 2 Experimental kit

RESULT AND DISCUSSION

Table 1 and Table 2 shows the results of induced current for varying the movement of the magnet bar and varying number of turns in the coil.

TABLE 1 Direction of induced current by varying the movement of the magnet bar

Movement of magnet bar	Direction of induced current	Value on ammeter's screen
Towards the coil	Counter clockwise	Positive
Static	No induced current produced	Zero
Away from the coil	Clockwise	Negative

TABLE 2 Changes in magnitude of induced current by varying number of turns in the coil

Number of turns	Value on ammeter's screen
Larger	Increase
Smaller	Decrease

CONCLUSION

The developed kit can be used as an induction set for demonstration in teaching and learning processes as well as experimental kit. This kit not only cheap in price but it is also portable and easy to handle. With this innovation, teachers will effectively demonstrate the production of induced current. Thus, it will urge spontaneity in students' understanding. The kit is also designed to be student-centered and user-friendly. Students will be able to do this experiment by themselves without a close monitoring by the instructor. Hence, it sparks the students' interest towards electromagnetic induction and enables them to appreciate the concept of Lenz's law.

ACKNOWLEDGEMENT

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AN ENHANCED MODEL FOR LENIENCY PROGRAMMES BASED ON THE PRINCIPLE OF ‘MORE CFI - TOLERANCE’

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ABSTRACT

A cartel is regarded as a disease that inflicts on the open market economy. Whilst its presence is detrimental to the public, the most serious issue is its secrecy, which has posed a major problem to competition authorities all over the world. To address this, many countries including Malaysia have introduced a leniency programme for the detection of cartels by persuading their members to approach the authorities to admit involvement in the cartel activities and assist the authorities to expose other cartel participants. The objective of this paper is to conduct a study on the legal framework of the Malaysia’s leniency programme. The paper contains a detailed analysis of the Competition Act 2010 (CA 2010), the Guidelines on Leniency Regime (Leniency Guidelines) by the Malaysia Competition Commission (MyCC) and academic research in this area. The findings show that while the leniency programme is available under the Leniency Guidelines, data on leniency applications made to date are not available on the MyCC’s website. In addition, the MyCC’s website revealed that of the six cartels that were found to have committed infringement, none had been detected through the leniency programme. Therefore, the effectiveness of the programme has yet to be proven.

Keywords: Cartel; harm; consumers; leniency; difficult.

INTRODUCTION

Connor (2008) defined a cartel as “an association of two or more legally independent firms that explicitly agree to coordinate their prices or output for the purpose of increasing their collective profits”. Based on this definition, the purpose of a cartel is to control the market with the aim of restricting competition. The reason for restricting competition is to maximise their profits collectively (Jasper, 2017). A cartel weakens an economic system that is based on an open market (Whelan, 2007). Hence, cartels are likened to cancer in an open economic system, and it only works to rob consumers’ money (Monti, 2000). To address this, many countries including Malaysia have introduced a leniency programme for the detection of cartels by persuading their members to approach the authorities to admit involvement in the cartel activities and assist the authorities to expose other cartel participants.

MATERIALS AND METHOD

A qualitative approach was used for this research consisting of a detailed analysis of the CA 2010, Leniency Guidelines and academic research in this area.

RESULT AND DISCUSSION

The leniency programme offers benefits to both the undertaking that receives immunity from a fine as well as to the MyCC which is able to pierce the cloak of secrecy of cartels and obtain insider evidence of the cartel infringement. The findings show that while the leniency programme is available under section 41 of the CA 2010 and further elaborated in the Leniency Guidelines issued by the MyCC, data on leniency applications made to date are not available on the MyCC's website. In addition, the MyCC's website revealed that of the six cartels that were found to have committed infringement, none had been detected through the leniency programme. The existing programme has several weaknesses that may affect the ability to achieve its objective. Therefore, the effectiveness of the programme has yet to be proven. This study recommends the following principle of 'MORE CFI - Tolerance' which stands for [more certainty, flexibility, incentive and zero tolerance of accepting undertaking involving cartel cases] to ensure the attainment of the objective of the programme. The details will be discussed below.

More Certainty

The MyCC may stipulate the fine reduction in *percentages* in exchange for the assistance provided by cartel applicants that *do not qualify* for 100% waiver. Therefore, the applicant *can* foresee the amount of fines that will be imposed by the competition authority after applying for the reduction.

More Flexibility

Under the current scenario, the cartel member that introduces the cartel (the ring leader) is not eligible to apply for immunity from the fines. Similarly, fine reductions are not offered when the MyCC already has evidence in relation to the cartel. The study recommends that the MyCC provides a wider scope for immunity eligibility so that the ringleader will also be eligible for the 100% fines waiver provided that it did not force others to participate in the cartel or even after the MyCC has commenced its investigation but has not found enough evidence of infringement (Uytsel & Ying, 2016). The justification is that the leniency programme was introduced to destabilise the cartel from within, and hence, application eligibility should be as wide as possible to encourage the cartel participants to approach the MyCC to inform about their activities, which will create strain and suspicion among the cartel participants.

More Incentive

To ensure that the programme manages to entice the cartel participants, the MyCC may consider establishing a Cartel Informant Reward Programme to offer attractive cash rewards to any person who possesses information about cartels to pass the information to the authorities (Aubert, Rey, & Kovacic, 2006). The incentive will serve to increase the fear of discovery by the competition authorities and hence, there will be a race among the participants to apply for immunity offered under the leniency programme (Miller, 2009).

Zero Tolerance of Accepting Undertaking Involving Cartel Cases

The key success factor of the leniency programme is the fear of sanction (Stephan, 2008). The punishment against infringement must be severe enough to serve as an effective deterrence. Therefore, it is recommended that the provision of section 43 of the CA 2010 in relation to the

power to accept undertaking is not applied in cartel cases, whereby section 43 (2) of the CA 2010 allows the MyCC to close its investigation without making any finding of infringement and hence, the enterprise will not be subjected to any fines.

CONCLUSION

Thus, it is hoped that the recommendations given above will make the leniency programme more attractive and can address the existing weaknesses in the programme so that it will attract the cartel participants in the future, leading to more cartel detection and better prevention. This mechanism could promote better quality of goods and services, more choices and variety for consumers, more innovation, greater efficiency and productivity, as well as economic development and growth.

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THE ADVENTURE OF SPEAKING BOX

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ABSTRACT

Speaking skill is one of the significant skills in learning English language. However, many students found it hard to be mastered. Therefore, *The Adventure of Speaking Box* is created with the objective to cultivate learners' interest to speak and boost their confidence level in communicating in English. It is an exciting game for students' learning process in classroom especially in speaking skill. In this project, 58 UiTM Foundation Studies students involved whereas they needed to play ten intelligent cards in the box with multiple real life situation related tasks weekly. The level of difficulty of the tasks were increased from one week to another. In order to play the speaking box, students had to finish all five checkpoints in which each checkpoint was assessed by a facilitator. They were to respond to the tasks orally in pairs. The finding showed that students performed better since they managed to come out with more complex sentences from first week to the tenth week. They felt comfortable to complete the tasks since the tasks were related to their actual life setting.

Keywords: The adventure of speaking box; communication skills.

INTRODUCTION

English is an important language to be mastered by all students. It comprises four skills; listening, speaking, reading and writing. Despite the fact that students spent at least 11 years by learning English before pursuing for tertiary education, many of them are still unable to master the speaking skill and have lack of self-confidence to communicate in English. Inadequate ability to communicate well in English is believed to be the factor for poor employability among graduates in Malaysia (Yahaya, Yahaya & Ismail, 2011). Therefore, there is a sense of urgency for English educators to become more creative with their lesson plans that can serve as a platform to support the learners' communicative competency in English. One of the ways that educators can consider is to implement a board game in their lessons as it helps to stimulate learners' interest in speaking and boost their confidence level in communicating in English. *The Adventure of Speaking Box* is an innovation created to assist students in their speaking skill in English language.

Aye and Phyu (2015) stated that in this globalization era, speaking skill is prominent for each aspect of our life. The claim was supported by Ratna, Umami & Ari (2016) who believed that speaking skill acts as one of the basic language skills to be mastered by English learners for communication purpose. However, some English learners feel anxious for making mistakes as well as uncomfortable to speak in English (Yong Mei Fung & Yeo Li Min, 2016; Ratna, Umami & Ari, 2016). Ergo, it is essential for educators to provide the fascinating speaking activities in classroom. According to Kapp (2012), games are interactive because players are required to interact with other players thus, it is effective and meaningful teaching tool to motivate learners

to speak. Furthermore, Min and Fung (2016) proved that board game can act as alternative way to decline anxiety to speak in English among students in classroom. Hence, they incline to be more confident and perform better in classroom.

A total of 58 UiTM Foundation Studies students were involved in this game. They played the activity according to the instruction of the cards in the box in pairs orally and were assessed by facilitators in order to determine their fluency in speaking skill. As supported from the previous studies, it is proved that the activity successfully triggered students to speak in English with confidence as they felt comfortable to talk about something related to them. Students managed to come out with various types of sentence patterns at the tenth week compared to the earlier weeks.

MATERIALS AND METHOD

In order to improve English learners' communicative competence as well as to reduce their anxiety to speak in English, *The Adventure of Speaking Box* is created. In this project, there were 58 UiTM Foundation Studies students were chosen as participants in which they were from Law course with 40 females and 18 males ranging from 18 to 19 years old. There were ten intelligent cards with ten different themes in the box whereas students needed to respond to the tasks orally in pairs. For 10 weeks, within 20 minutes before the class ended, students played each card with several real life situation tasks related to the themes weekly. The relevance to specifically design the tasks related to real life situations as to expose learners to actual life conversations. This is to allow them to practice and communicate confidently in the actual settings. The levels of difficulty of tasks increased from lower intermediate to advance according to the week as it is believed that students will develop higher confidence level from one week to another. There were five checkpoints set by educator and facilitators were assigned for each checkpoint to assess the students' fluency. The students had to complete each checkpoint and responded to the different tasks orally by using simple and complex sentence structures in English depending on their proficiency levels. Since there were no fixed answers, it provided students relaxing atmosphere for the students and they were more comfortable as they got the freedom to express their responds based on their prior knowledge on the tasks. The educator can always change the situation cards depending on its suitability to the participants.

RESULT AND DISCUSSION

The findings from the project proved that most of the students enjoyed the 20 minutes activities and it can be said that there is an improvement in self-confidence when the students showed their interest to move to the next checkpoint and pick the task cards because they were comfortable to complete the tasks given. With the tasks related to the real life situations, students do not feel stress to respond to the tasks as they have the freedom to speak as they pleased. Moreover, it helps them to be comfortable to communicate with their group members upon completing the task. With the advancement of the use of technology in and outside of a classroom, *The Adventure of Speaking Box* can also be designed as an application for a smartphone or a tablet. Hence, it can be played even outside of a classroom and it can help in improving learners' speaking skill because they have more time to practice to communicate in English.

CONCLUSION

To conclude, *The Adventure of a Speaking Box* is an activity that is created to trigger students' communicative ability that can be customized according to the educators' creativity by creating a task or a situation depending on the classroom's needs, learning objective and standard competency from the syllabus that they want to achieve. The practicality of this speaking box has enabled it to be used in a classroom. Nevertheless, the limitation of this study was difficulties in facilitating the activities where the students who were assigned as facilitators have about the same level of proficiency with the participants. To best evaluate the improvement, the teacher needs to see how these participants present the task and provide feedback. It is suggested that facilitators should record and facilitate during the activities. The 20 minutes time given was also not enough as the participants have already become comfortable to speak.

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IMPROVED PERFORMANCE OF CATHODE MATERIALS DOPED WITH Sn FOR Li-ION BATTERIES

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ABSTRACT

Lithium-ion batteries are promising energy storage devices due to its high energy density as well as low raw-materials costs. Lithium Manganese Titanium Oxide, $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ is being considered as one of the favourable options to replace the commercialized cathode material LiMn_2O_4 . Unfortunately, $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ showed barely improvement in terms of its capacities. Due to this drawbacks, partial substitution of Sn was done to replace Ti in $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ cathode material producing $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ novel stoichiometry by using the modified Self-Propagation Combustion method (SPC). The precursors obtained were then annealed at 700 °C temperature for 24 hours in a furnace. The structure of the materials was characterized using X-ray Powder Diffraction (XRD). XRD results showed that all samples are well crystalline and single phase. The electrochemical performances of the materials were characterized by galvanostatic charge-discharge test in the voltage range of 2.0 V- 4.2 V using a current of 1.0 mA. Results showed that the doped material performed better than the undoped material with improved cycling performance compared to the undoped.

Keywords: $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$; cathode materials; lithium-ion batteries; structure; electrochemical.

INTRODUCTION

Studies in lithium-ion batteries has progressed enormously in the past few decades through an increasing market demand for portable electronic devices, such as laptop, iPad, drone and cellular phones (Hong & Sun). Compared to other systems, such as LiCoO_2 , lithium manganese spinel LiMn_2O_4 is a very attractive material (Ozawa). However, it displays some disadvantages such as drastically capacity loss upon long range cycling due to the Jahn-Teller effect and also suffers weak crystal structural stability (Xifei et.al.). Partially substitution of the manganese ion with other transition metal such as Al, Cu, V etc. is thought to be one of the way to improve its stability, increase its capacity retention as well as improve its cycling performance (Hwang et. al.). So, in this work partial substitution of Ti in Mn has been done on LiMn_2O_4 . But unfortunately, $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ does not shows much improvement as expected hence, we proposed to dope Sn as dopants in $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$. The results of doped $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ materials will be discussed further in the results and discussion part. Combustion method is a well-known method used for the production of metal oxides and also ceramics (Lee et.al.) So,

in this work, we synthesized the samples by using the modified self-propagation combustion method.

MATERIALS AND METHOD

Stoichiometric amounts of lithium nitrate, LiNO_3 , manganese (II) nitrate hydrate, $\text{MnN}_2\text{O}_6 \cdot 4\text{H}_2\text{O}$ and titanium (IV) nitrate, $\text{TiN}_4\text{O}_{12} \cdot 4\text{H}_2\text{O}$ were dissolved in deionized water and homogeneously mixed. This procedure was done using tin (II) oxide, SnO for the doped samples. A suggested amount of Triethanolamine, TEA ($\text{NC}_6\text{H}_{15}\text{O}_3$) is added into the mixture as a combustion agent. The mixture is continuously stirred until no precipitate can be observed. After the mixture is completely dissolved, it was heated at a low temperature of 250°C . The mixture combusts when it has reached its ignition conditions. It took less than five minutes for the precursors to dry. This method is super-fast with high purities.

RESULT AND DISCUSSION

The X-ray diffraction pattern (XRD) of $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ and doped $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ annealed at 700°C for 24 hours are shown in Figure 1. Both samples show a well-defined spinel crystal structure without any impurities detected. All diffraction lines can be indexed accordingly and it is agreed with the ICDD No. 00-035-0782 indexing from the XRD. It can be observed that all twelve fingerprint peaks that are; (111), (311), (222), (400), (331), (511), (440), (531), (533), (622), (444), and (711) are easily identifiable in all of the XRD patterns. All the diffraction peaks can be indexed with face centered cubic (fcc) type structure based on spinel crystal system with space group of $Fd\bar{3}m$.

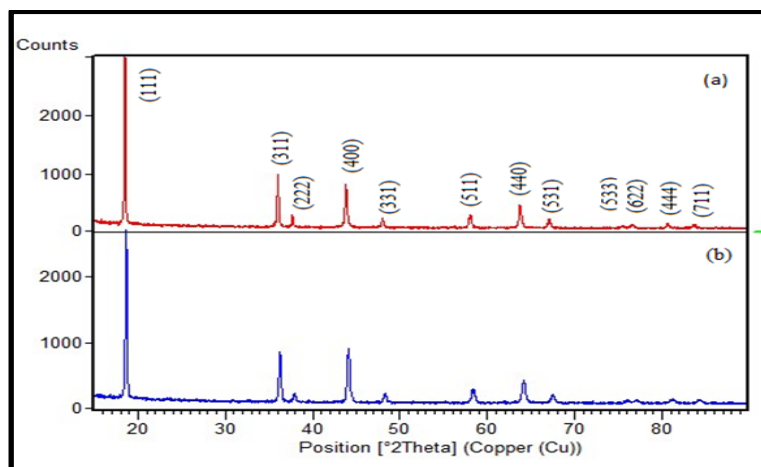


FIGURE 1 XRD patterns of samples (a) $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$
(b) $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ annealed at 700°C for 24 hours

The first cycle of the charge-discharge curves for both materials and its specific capacities of the cells up to 50 cycles are shown in Figure 2. For $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ and $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ samples annealed at 700°C for 24 hours, it delivered an initial specific discharge capacity of 119.87 mAhg^{-1} and 147.92 mAhg^{-1} , respectively. $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ sample shows better capacity fading that is 21.39 % compared to $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ sample where the capacity loss is a higher that is 49.90 % after the 50th cycle. The excellent capacity retention of $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ sample material is largely due to the structural stabilization which results from the co-doping of Sn in Ti. Substitution doping of Sn in $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ material

has improved the battery performance as well as improved cyclability compared to the standard $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$.

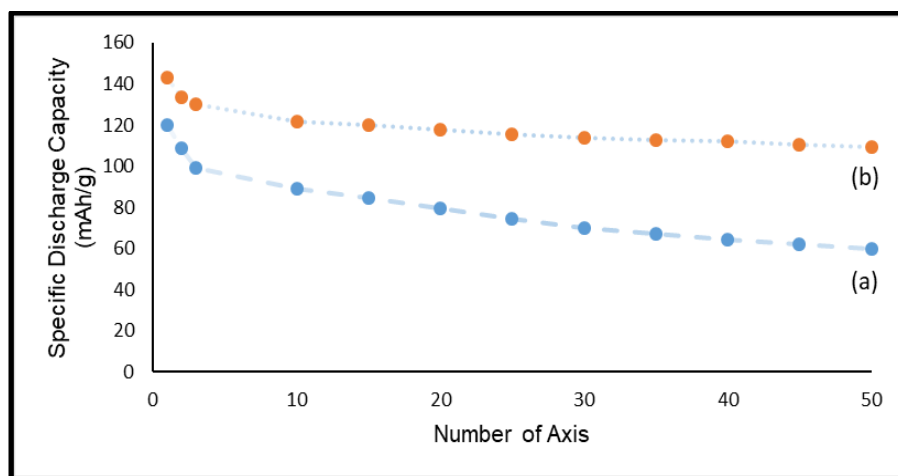


FIGURE 2 Initial charge-discharge curves for samples
 (a) $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ and (b) $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ annealed at 700 °C for 24 hours

CONCLUSION

$\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ and doped $\text{LiMn}_{1.9}\text{Ti}_{0.095}\text{Sn}_{0.005}\text{O}_4$ prepared by the combustion method has produce single and pure phase materials proved by the XRD at the annealing temperature of 700 °C for 24 hours. Substitutional doping of Sn in the crystal lattice of $\text{LiMn}_{1.9}\text{Ti}_{0.1}\text{O}_4$ has been done successfully and has improved the battery performance.

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GENEX-KIT

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ABSTRACT

The expression of gene into proteins is divided into two stages, transcription and translation. Transcription is the synthesis of mRNA (messenger RNA) using DNA strand as a template. Translation on the other hand is to synthesize a sequence of amino acids based on the nitrogenous base sequence in mRNA. GeneX KIT is designed to provide hands on learning tools for students to interact and discuss in group guided by instructor. The GeneX KIT can accommodate 30 students at maximum with 6-5 person per group. It is suitable to be used in a classroom and as laboratory practice. It is equipped with a magnetizer instructor set and eraseable students' set which will allow instructor to first demonstrating easily followed by a hands on practical by students using their own set. Hence, students will be able to practice genetic expression in a fun and entertaining way.

Keywords: Transcription; translation; protein synthesis; genetic expression; educational kit.

INTRODUCTION

The genetic information stored in DNA of an organism leads to a specific trait by dictating the protein synthesized or, in some cases, RNA is functioning as RNAs instead. The expression of gene into proteins is divided into two stages, transcription and translation. Transcription is the synthesis of mRNA (messenger RNA) using DNA strand as a template. The mRNA is then transported to cytoplasm from the cells' nucleus. Obfuscation usually occurs since both type of nucleic acid; DNA and RNA used different nucleotide bases. The five types of nitrogenous bases are Adenine (A), Guanine (G), Cytosine (C), Thymine (T), and Uracil (U). DNA used A, T, C, and G whereas RNA used A, U, G, and C. Hence, the base pairing between DNA and RNA is rather tricky for most students to understand. Translation on the other hand is to synthesize a sequence of amino acids based on the nitrogenous base sequence in mRNA. Three mRNA base sequences (codon) will code for one amino acid. Next, students need to read the mRNA codon table to translate the code into its respective amino acids according to the correct sequence. Translating a wrong sequence will results in wrong polypeptide formed.

Gene expression also involves numerous of proteins, enzymes as well as other RNAs. The transcription itself is later divided into three more stages: initiation, elongation and termination followed by modification of mRNA in eukaryotic cell. Then only translation takes place. Translation on the other hand is divided into three stages, each with its own description and subdivision

Therefore, in order to increase students' interest and understanding, a creative approach must be taken. Narrowing down into learning protein synthesis, Mensch and Rubba (1991) used CPVC pipe, polypropylene rope etc as a hand on model to develop students' positive attitudes towards biology and deepens their knowledge. Later, Sphren 1993 suggested a teaching method

using Lego and later the idea is improvised by Mark in 2002. In 1995, Rode proposed a simulation using students' themselves acting as elements needed during protein synthesis. The simulation requires a minimum of 21 students at one time with a tedious material preparation needed. Many approaches have been introduced by science instructors to improve learning efficiency on gene expression into protein. Therefore, this kit is developed to help instructors in conducting efficient 21 st century learning in the classroom.

MATERIALS AND METHOD

The KIT consists of two kit: Instructor's kit and five Student's kit. The GeneX KIT can accommodate 30 students at maximum with 6-5 person per group. It is suitable to be used in a classroom and as laboratory practice. Instructor's set is equipped with magnetic models that stick to whiteboard. Models include DNA strand, mRNA strand, RNA polymerase enzyme, complete labeled of ribosome, tRNA and amino acid molecules. Student's set consists of a board, DNA sequence card, and small sized of other elements as in instructor's set. Students can try to run the process on their own and start their own discussion using the set as explained by instructor earlier. To add more excitement, GeneX sheets is included in the Student's set. Students' can shuffle the DNA card given, transcript and translate the gene to protein sequence by writing the correct answer into their own GeneX sheet. The first player who can translate the right amino acid sequence wins the game.

RESULT AND DISCUSSION

Observation was made to students in foundation (A-level) level of education, an international commercial protein synthesis kit was used in the classroom to demonstrate the overview of protein synthesis process. However, the kit is big, heavy and have few other weaknesses which leads to an invention using game based approach to learn genetic expression (protein synthesis). An experimental paper was written by Mohd Adlan et al. 2017 to elucidate the usage of the card game 'Protein Synthesis Protein Synthesis Game' as a students' learning tool in studying the Biology topic protein synthesis at a foundation (A-Level) level of education. 24 experimental students in 3 induced groups and 24 controlled students in controlled groups were involved in the experiment. Results indicate that students have better facilitative communicative engagement in learning protein synthesis when playing the game as compared to studying the topic from a book. Data suggests that such communicative engagement may lead to a successful meaningful learning on the students' part.

The card game only involves students' activity without any tools for instructor to demonstrate the theory. Other than that there are numerous cards in the students' hands which can be confusing. Hence, GeneX KIT is developed to improvised all weaknesses in order to increase students understanding as well as their self interest in learning genetic expression. Using light weight material, GeneX KIT is small size and portable suitable to accomodate learning process in the classroom. Students' set is erasable so it can be used many times. GeneX Sheet is also added to the students' set as a game-based approach which proven to be effective in increasing facilitative communicative engagement in learning.

CONCLUSION

Challenges of the 21 st century learning demands a creative approach to provide students with understanding as well as self motivating to learn. GeneX KIT is developed to help instructor conducting the learning genetic expression process in fun and entertaining way to fit with the

students' demand. This kit have high potential to be a useful tools used in various schools, matruculation college as well as any foundation studies centre in Malaysia.

ACKNOWLEDGEMENT

We would like to thank Biology Unit, Centre of Foundation Studies UiTM for allowing us to developpe this kit and conduct simple study case among the students.

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GRAMMAR STACKKO

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ABSTRACT

Grammar Stackko is an interactive educational game with the combination of the classic wheel of fortune and jengga block. It is to assist the Foundation students in learning and understanding grammar topic in a more effective manner. The game is played by stacking the colourful blocks with grammar questions pasted on the blocks. The purpose of the wheel of fortune is to indicate the chosen colours for the block to pull. A penalty will be imposed for wrongly answered questions and collapsing of the tower. The pilot students showed positive impacts and feedbacks after playing the games.

Keywords: Grammar; educational game; part of speech; interactive; fun.

INTRODUCTION

Learning grammar can be a tiring process to the learners. Learners are expected to invest constant effort to learn the grammar rules and exceptions in English. Here, in this context, the researchers are looking into a specific/narrowed focus which is parts of speech. If the students want to write well, then it is important that the students know the tools of the trade. If the students understand the different parts of speech, it extends the range in vocabulary, because students can choose other words from the same set of elements. The greater the understanding of the parts of speech, the more concisely and unambiguously the students will use the language, whether in speaking or writing.

The knowledge of the Parts of Speech is vital in writing good sentences. One cannot write grammatically correct sentences without knowing at least some of the “Parts of Speech”. As an added advantage, the ability to master the whole Parts of Speech can help advance the writing skills. Even though learning grammar is a tiring process but it can be introduced in a number of ways and one of them are games. Grammar games, if used wisely, can really break up the monotony of what is considered to be one of the worst and more difficult aspects of learning any language. In short, “using grammar games in the ESL classroom can allow for meaningful use of the target language in the right context” (Simon, n.d). This is the main objective of introducing Grammar Stackko. Grammar Stackko also helps to revise and reinforce structure already learnt. It also functions as a very meaningful practice of language especially in this case, namely Parts of Speech. Employing the correct use of grammar (Parts of Speech) helps the learners to create clear, well-structured, unambiguous sentences. Many young English as Second Language (ESL) students are not aware about the importance or the need to learn and study grammar. To them, the teachers are the ones that make them to study grammar.

Students learn new grammar rules every day, but still have difficulties applying them when the students speak or write in English. The most common grammar problem that is faced by the

students is the misuse of Parts of Speech (Zuriah, 2013). Nonetheless, it is necessary for the students to master grammar in order to be competent in the four language skills because incorrect use or lack of understanding of Parts of Speech might hinder communication either in speaking, writing, listening, or reading. Playing grammar games is important because of the students' young age to grasp the concept of the importance of grammar. Indirectly, learning would take place which is something that is very valuable that will assist the students with the grammar knowledge.

This prototype Grammar Stackko is an interactive way of testing the students' understanding in grammar topic which focusing on part of speech. It is the improvisation and adaptation from the classic Jenga Tetris (2013) block stacking game and wheel of fortune (1975). This portable and light-weight Grammar Stackko game could be played anywhere, either in a big or small group of students. The game begins with a spin on the wheel of fortune to determine the colours. Once the colour is chosen, a player has to pull the block of the indicated color carefully to retrieve the question which is pasted on each of the block. If the stacking collapses, the player has to face a penalty.

MATERIALS AND METHOD

Participants

60 foundation students which consist of 30 law students and 30 science students were selected for the pilot study. The participants were chosen through a purposive sampling as to see the effects of Grammar Stackko on both the advanced English learners i.e the Law students and the intermediate English learners i.e the Science students from Universiti Teknologi Mara, Dengkil Campus.

Instrument

The Grammar Stackko was created by combining the rules of the present game, Jenga with the rules created by the researchers. The researchers pasted parts of speech questions which are noun, pronoun, adjective, verb, adverb, preposition, conjunction and interjection on the blocks of the Jenga. Then, students pulled a block from the tower carefully so that the tower would not fall and answered the question on the block. Those who were unable to answer the question will be penalised by being barred from the next round. The game ends when the tower falls.

RESULT AND DISCUSSION

According to the survey conducted for the pilot study, Grammar Stackko brings positive influence in teaching grammar to foundation students. Most feedbacks received from the students saying that they had fun while learning, yet at the same time managed to understand the lesson. When playing Grammar Stackko, not only they can improve in grammar, but surprisingly the students also stated that they can improve their reading, speaking as well as communication skills. Besides motivates the students, Grammar Stackko also boosts competitiveness in them and stimulates interaction in classroom.

The students also claimed that they loved the support from their team members as well as the feedback provided by the instructors when they wrongly answered some of the questions. The team members tried to help their teammate in answering the questions while the instructors provided the students with the correct answers together with the explanation. Last but not least,

all the 60 students from the pilot study agreed that Grammar Stackko should be practiced in all subjects and they were eager to play this Grammar Stackko again in the future with different contents.

The main objective of this study was to investigate the effectiveness of using games (Grammar Stackko) in teaching grammar (Parts of Speech) to Foundation Students. Indeed, games are known to be affective in classrooms because they will help the students to enhance their focus on the targeted activity and will end up absorbing the language subconsciously. Therefore, using games in English language classrooms is one of the ways to help students learn, review, and internalise various grammar structures. As the findings of this study show, games are an important and necessary part of English language teaching and learning because it can direct learners' energy into language learning since it is important for a learner to be physically active and creative in a language learning classroom.

Even though it is a small scale study involving only 60 students, it is a crucial initial step to identify on how the learners' perception on learning English grammar using games as the method. Lastly, language teaching can be enriched through the inclusion of games in course book and materials that will result in the positive attitude among students in learning English.

CONCLUSION

To ensure the effectiveness of any games, there are many internal and external factors that should be considered. The factors include choosing a specific type of games that is suitable for any subject and the most appropriate time to play it in class. For instance, Grammar Stackko game suits in assisting the students' understanding of grammar, specifically Part of Speech. On the other hand, the lecturers and facilitators involved should be able to control the flow of the games and have to be prepared, organised and fully in-controlled. In order for a game to be played successfully, the facilitators and lecturers should know their roles well enough because the initial purpose of integrating games in class is to avoid a passive monotonous environment and retain students' attention throughout the session.

ACKNOWLEDGEMENT

The researchers of this Grammar Stackko would like to acknowledge the continuous support given by the Centre of Foundation Studies, UiTM Cawangan Selangor, Kampus Dengkil and also the organising committee of this 'Pertandingan Inovasi Pusat Asasi 2018'. Also, the researchers would like to express a deep gratitude to Mrs. Sathiya for her generous support in making sure this game turns into reality.

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MOL-G BY ANAQ

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ABSTRACT

MOL-G by ANAQ was developed as an enjoyable teaching and learning aid for chemistry students at foundation level. Foundation programmes prepare students into a degree program. Chemistry is one of the major subject taught at science foundation level. Teaching chemistry is challenging and requires creativity. Therefore, different types of teaching method have been employed to help students understand the subject matter better and more effectively. One of topics taught in foundation chemistry is molecular formula and molecular geometry. From our teaching experience, it seems that students found difficulties in understanding the concepts regarding molecular formula and molecular geometry. Thus, MOL-G by ANAQ was created. MOL-G by ANAQ is consists of a puzzle and a board game. Students will be provided with eight envelopes and a box containing terminal atoms. Each envelope contains a central atom. The puzzle is completed when the correct molecular formula is obtained. Next, they will match the properties of the obtained molecular formula with the cards provided. The properties cards will be arranged on the board game to predict molecular geometry. It is expected that MOL-G by ANAQ will help lecturers to deliver their curriculum more efficiently.

Keywords: Educational games; chemistry puzzle; chemistry concept; molecular geometry; learning aid.

INTRODUCTION

Molecular geometry is one of the topics taught in chemistry at foundation level. Various methods are being employed in order to help students have a better understanding of the topics taught. Methods include such as games, play card, quizzes and puzzles. Gameplay seems to work well as a tool for understanding, reinforcement, demonstration, and cooperative review (Michael, 2014). Games provide an entertaining way to facilitate students' learning (Bayir, 2014). The design and implementation of the game as an educational tool also assisted in the development of the teacher's skills and these abilities affected the way in which the teacher conducted the classes and facilitated student learning (Antunes, 2012). Puzzle may be useful to teachers for encouraging students in the learning process as well as testing their skills because it requires a combination of chemical knowledge and intelligence (Peris, 2007). MOL-G by ANAQ is designed to help students revise and test their knowledge on molecular geometry with fun. There are a total of eight molecular formulae to be formulated and eight molecular geometries to be predicted. The main aim of MOL-G by ANAQ is to produce a teaching and learning board game as an aid for chemistry students at foundation level. MOL-G by ANAQ is also designed to create a fun and interactive environment in studying molecular geometry.

MATERIALS AND METHOD

MOL-G by ANAQ can be played individually or in groups. The game is divided into two parts: Game 1 (puzzle) and Game 2 (Board game).

Game 1 (Puzzle): To Determine the Molecular Formula

Players in this game are provided with envelopes containing a central atom and a box containing terminal atoms. The game begins when all players pick an envelope that contains a central atom. They then select the appropriate cards from the 'terminal atom' box that matches the central atom. The player who has completed the puzzle will say out loud the molecular formula of the compound. The sequence of saying out loud of the molecular formula will determine the turn for each player in GAME 2. All players will proceed to GAME 2 after completing GAME 1 by collecting the 'Mol-G Board'.

Game 2 (Board Game): To Determine the Molecular Geometry

The board game will be displayed to start the game. The cards will be divided into six different categories, which are molecular formula, Lewis structure, number of bonding pairs and lone pairs, bond angle, polarity and hybridization of central atom. Players are supposed to choose the correct card for the first category before proceeding to the next category. Each player will be given 20 seconds to select the appropriate cards based on the instructions on the 'Mol-G Board' provided. Time keeper will announce for the next player to select in every 20 seconds until all the questions in 'Mol-G Board' are answered. In case the player did not manage to select the correct card for the first category in the 20 seconds, the player is not allowed to proceed with the next category. The completed 'Mol-G Board' will reveal the molecular geometry of that compound. The winner will say out loud the molecular geometry of the compound.

ELEMENT	SYMBOL	ATOMIC NUMBER
Beryllium	Be	4
Boron	B	5
Carbon	C	6
Chlorine	Cl	17
Fluorine	F	9
Hydrogen	H	1
Nitrogen	N	7
Oxygen	O	8
Phosphorus	P	15
Sulphur	S	16
Xenon	Xe	54

FIGURE 1 List of elements with atomic number

CONCLUSION

MOL-G by ANAQ is suitable for all students studying chemistry at foundation level. It is a useful teaching and learning aid. As there is limited board game learning tool available in the market, MOL-G by ANAQ should be a useful and fun learning tool for students.

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POLARIZATION OF LIGHT EXPERIMENTAL KIT

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ABSTRACT

Polarization of light causes the intensity of light dropped due to orientation of the polarizers used and can be calculated by using Malus' Law. In accordance to 21st century learning model, students recently prefer something to see and to be experienced by themselves rather than explained theoretically. Thus, a simple polarization of light experimental kit has been introduced and developed to enhance the students understanding and make them able to visualize the polarization phenomena. This experimental kit is low-cost and mobile so that it is easier for educators to carry and bring it to class and demonstrate. Furthermore, it can also catch the students' interest and can become the students' "hands on" activities. A survey has been done on a sample of students at Centre of Foundation Studies, UiTM Kampus Dengkil regarding their understanding of polarization concept after they implement this experimental kit by giving out a set of questionnaire. From the analysis, 58% out of 120 students agreed the experimental kit is very good in understanding the Malus' Law concept. The result also stated 56% of students answered very good towards the experimental kit which attracted them to learn physics. In addition, 58% of students indicated that the experiment kit was very helpful in the learning process. Otherwise, 49% of students agreed the experimental kit is very good to increase the confidence in learning physics. From the result, it is obvious that this experimental kit has help the students' understanding regarding the polarization topic.

Keywords: Mobile experimental kit; unpolarized light; polarized light; polarization of light; malus law.

INTRODUCTION

Light wave is one of the chapters to be covered in a foundation physics course. This interesting topic do have a lot of relation toward real phenomena happened around us. Conceptual understanding of this topic is the main problem among students in Foundation level. They able to do the calculation very well based on formula given but unable to describe the concept beyond it. According to Girad and Wong (1) state that conceptual understanding requires both knowledge and ability to use scientific concepts to develop mental models about the way the world operates in accordance with a current scientific theory. Furthermore, most educators also believed that science teaching and learning process should emphasize on conceptual understanding and logical process skills which stray off science primarily method, recall or memorizing of factual information and computation (2). In a chapter polarization of light, there is an equation called Malus' Law to calculate the reduction of intensity. Generally, educators will explain and give the formula. In addition, they will briefly explain the phenomena related to it. This method kind of bored to apply nowadays. Therefore, an innovative approach has been introduced which is by doing real demonstration in front of students.

MATERIALS AND METHOD

Teaching a chapter of polarization light involve one special equation called Malus' Law. Traditionally, it has been taught chalk and board and giving away the equation. Firstly, student been given the equation and apply it to solve any intensity problems. The teacher explained and gave example of phenomena. After that, teacher used polarization of light experimental kit to explain and show them how the intensity reduced. The calculation of intensity is proven with the real demonstration shown in front of them. Student answered the questionnaire to survey the effectiveness of the kit. The data was obtained from the survey.

RESULT AND DISCUSSION

We analysed the results from student's perception before and after using polarization of light experimental kit. The results obtained based on the questions which the objectives of the product are being introduced.

Figure 1 shows the result based on percentage of the samples answering the survey questions. For question 1, 58% out of 120 students agreed the experimental kit is very good in helping them to understand the Malus' concept. The objective of question 2 is to attract the students to learn physics subject. The result shows 56% of students answered very good towards the polarization of light experimental kit. In addition, 58% of students give very good respond toward question 3 that asking them about gaining interest in learning process after using the experimental kit. Otherwise, 49% of student agreed the experimental kit is very good to increase the confidence in learning physics.

From the graph we also can analyze, the gap between moderate is half of very good for all the questions asked. This cause perhaps the students themselves not really understand what are they have learned on the topic. They just like to be part of hands-on activitie or maybe they do not have interest to learn physics after all.

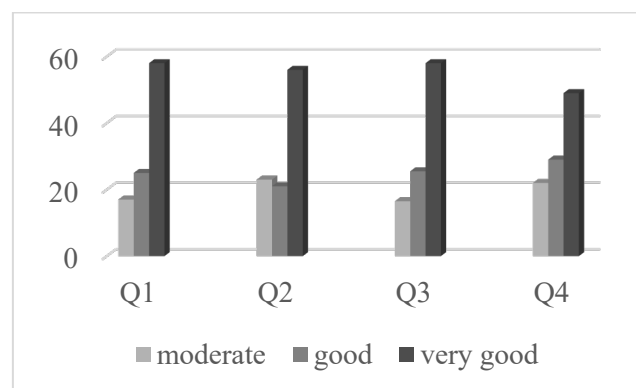


FIGURE 1 Percentage of sample

We perform the calculation while using the experimental kit by using equation below;

$$I = I_0 \cos^2 \theta \quad (1)$$

The equation called Malus' Law. It shows the reduction of light intensity obtained and being proved by the experimental kit on the spot.

CONCLUSION

In a nutshell, the polarization of light experimental kit is successful in achieving all the objectives of the product appearance.

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CO-CURRICULAR REGISTRATION SYSTEM FOR PUSAT ASASI UiTM

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ABSTRACT

Centre of Foundation Studies (CFS) in Universiti Teknologi MARA Cawangan Selangor Kampus Dengkil has been given responsibility in handling their students' co-curricular activities. In every intake, almost 5,000 students registered as new students. Co-curricular activities are part of important elements in the foundation program. Besides that, the co-curricular activities contribute 10% merit for application to the undergraduate programs as set up by Bahagian Pengurusan Kemasukan Pelajar (UPU). UiTM Kampus Dengkil has assigned co-curricular supervision to the academic staff where each lecturer can only supervise one co-curricular club of 40 students. The registration process was done manually and based on first-come first-serve basis. During the orientation week, students are informed on the list of co-curricular clubs, name of the supervisor and the venue for each co-curriculum activity. During the registration day, students will rush to one particular venue to do the registration. Thus, this results into an uncomfortable situation and students have to go through a long queue due to the manual registration process. Even some students who already waited for a long time could not register to that particular club as the maximum number of students in each club is 40. They will start searching for another club to join in but end up with unidentified available club. Therefore, to overcome the current situation, a co-curricular online registration has been developed for UiTM Kampus Dengkil. The Program Development Life Cycle (PDLC) has been adopted as the methodology to develop the system which consists of 5 phases. It starts with problem identification followed by planning, debugging and lastly testing and documentation. PHP programming language and Microsoft SQL Server 2012 as a database has been used to develop this online system. As a result, this system gives benefit to 5000 students in registering their co-curricular activities for the session 2018/2019. UiTM Dengkil management is also able to identify those who failed to register into the listed clubs.

Keywords: Co-curricular; activity; registration; student; database.

INTRODUCTION

Co-curricular has long been practiced in Malaysia's educational system to produce excellent student spiritually and mentally. The intention of the management in providing co-curricular activity is for students to broaden their interests beyond the classroom, in a less formal atmosphere and in areas they have chosen. When the students participate in co-curricular activity, it will provide great opportunities for the students to have new friends and learn from like-minded students (Farman et al., 2018). The co-curricular is not just focusing on sports activities but also in art and design, humanities, sociology, innovation, religion and others (Adnan Abd. Hamid et al., 2016). For a student to apply for a place at any public university in

Malaysia through UPU system, it is a requirement for students to score a maximum of 10% in co-curricular activities. Therefore, the Co-curricular Registration System (CRS) was developed for Center of Foundation Studies, Universiti Teknologi MARA as a platform for students to register co-curricular activities organized by student club, academic affair, student affair, lecturer, campus and resident college. In addition, the CRS is also being used by the students to monitor their achievement in co-curricular right after they have attended any activity.

MATERIALS AND METHOD

In this work, software development life cycle (SDLC) is suitable method of this study because it can get a working version of the application early in the process and it is less expensive to implement changes of the system. This methodology also gives a review at the end of each phase and a project manager can keep track of the progress and see the project development delivers the target of their goals. In addition, it also allows for management to exercise their control greatly with formal documentation to ensure the system requirements can be traced back to the original business needs (João & Hugo, 2018).

On top of that, this methodology assists us to deliver a quality product on time and follows the requirement of the user. Besides that, we need to ensure that all the user requirements are fulfilled with least amount of resource consumption (Sahil Barjtya et al., 2017). In order to ensure this system works properly, we used the system requirement for the hardware with these specifications (2X processor Intel® Xeon(R) CPU E5-460 0 @2.4 GHz, Microsoft Windows Server 2012 Standard for Operating System, 16.0 Gigabytes for Random Access Memory (RAM) and 64-bit Operating System with X64-based processor). For the database specification, we have chosen Microsoft SQL Server 2012 software to store all the students' data, lecturers' data and information for the activity. We used PHP programming version 7.0 for the designing of interface for this system and it collaborates with XAMPP Apache Version 7.2.4 as a web server.

There are many ways in which a system developer is used to approach the process of system development. In the process of system development, we have chosen SDLC as a designing approach in which it has five (5) steps including problem identification, planning, coding, debugging, and testing and documentation. In Fig 1 below, it shows the achitecture of the user inface framework for co-curriculum registration system. This system framework is divided into three regions: client, application server and database server side. Three-tier client-server architecture is employed in this framework.

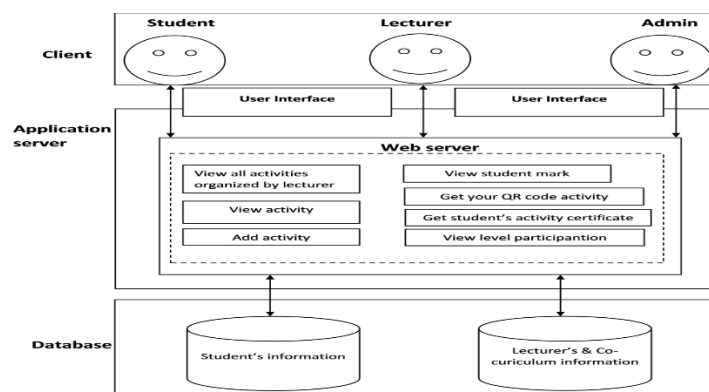


FIGURE 1 User Interface framework for co-curricular registration system

RESULT AND DISCUSSION

After the students have successfully log-in to CRS system, the interface of homepage will appear. From the homepage, students are given options to view co-curriculum information, update student's personal information and join activity. From Co-curricular Information menu, students can view available co-curricular programs offered in the current semester according to different categories such as sports, culture, language, handy craft, Islamic society and many more. Other than that, students can also view the number of available seats left for each co-curricular activities.

In Fig. 2, it shows the sub-menu under Activity Entry. The students can also view their co-curricular progress marked under "View Student's Marks" as shown in Fig. 2. The interface will display a list of activities attended by the students and the marks that they gained from each activity. At the bottom of the list, the total mark is displayed to let the students know their achievement.



FIGURE 2 Activity entry sub-menu

CONCLUSION

Students prefer to use QR code method than paper-based method to record their attendance and marks into the system even though the network connection is poor. Thus, this paper suggests the academic center to increase network speed to handle thousands of users' request everyday especially when there is a need to record marks using QR code during any big event in the campus. The CRS has gained many users' trust on the effectiveness of using QR code in recording the students' activity marks. The small number of QR code reader at the event site should not be a factor that will make people avoid using QR code in the future. Therefore, the event organizer at the academic center should open more counters with QR code reader device to enhance the registration flow. However, this must also be supported by a strong network speed; otherwise, it is meaningless.

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ELECTRICAL STUDIES OF HEXANOYL CHITOSAN/PVC BASED POLYMER ELECTROLYTE

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ABSTRACT

Film of hexanoyl chitosan/poly (vinyl chloride) (PVC) blends comprising NaI were studied. The highest ionic conductivity of $1.49 \times 10^{-5} \text{ S cm}^{-1}$ were achieved for hexanoyl chitosan/PVC (90:10)-30 wt. % NaI. The increase in conductivity with salt content can be attributed to either an increase in the number density of charge carriers, n and/or mobility of charge carriers, μ .

Keywords: Hexanoyl chitosan; PVC; polymer blend; conductivity.

INTRODUCTION

Solid polymer electrolytes (PEs) attracted a great deal of scientific interest since 1970s. SPEs are solid solutions of salts in polymer matrixes. Efforts for conductivity improvement of SPEs pointed towards the enhancement of both charge carrier density and mobility (Aziz & Abidin 2014). Charge carrier mobility is strongly correlated to the polymer segmental motions. For SPE system with a semi-crystalline polymer matrix like hexanoyl chitosan, mobility of charge carriers is attributed to the segmental motions of polymer chain in the amorphous phase (Winie, 2006). The aim for employing hexanoyl chitosan-based polymer blends as matrix material was for improving both the mechanical properties and ionic conductivity. In this work, hexanoyl chitosan/ poly (vinyl chloride) (PVC) semicrystalline/ amorphous polymers blends will be employed as the matrix material with NaI as the doping salt.

MATERIALS AND METHOD

Samples Preparation

Films of the NaI-doped and undoped-hexanoyl chitosan/PVC blends were prepared by solution casting technique. Composition of hexanoyl chitosan and PVC was fixed at 90:10. The NaI concentrations vary between 5 and 40 wt% . The electrolyte solutions were cast into different glass petri dishes and left to dry at room temperature until films were formed.

RESULT AND DISCUSSION

Room Temperature Conductivity

The variation in conductivity as a function of NaI concentration blend of hexanoyl chitosan and PVC at 90:10 is presented in Fig. 1. After the addition of 10 wt.% NaI, the conductivities

of blend system increase from 3.1×10^{-9} to $4.2 \times 10^{-8} \text{ S cm}^{-1}$. The increase in the conductivity up to certain amount of NaI due to the increase in the number of free ions, n as salt provides free ions into the polymer matrix (Muhammad et al., 2019). The decrease in conductivity value is due to the decrease in the number of free I^- ions as a result of ion association. Ion association leads to the formation of ion pairs, triple ions and even multiple ion aggregates. These neutral ion pairs or neutral multiples decrease the number of free ions and increase the medium viscosity. Increase in medium viscosity decreases the mobility of I^- ions.

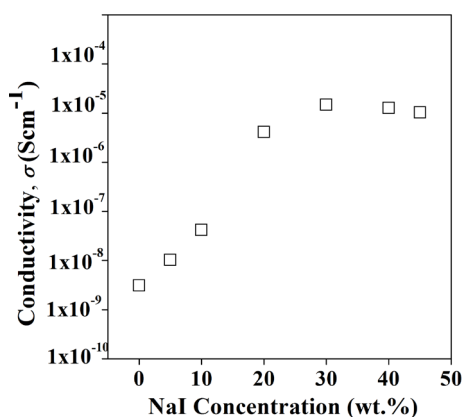


FIGURE 1 Room temperature conductivity with respect to NaI concentration for blend of hexanoyl chitosan/PVC at the composition of 90:10

CONCLUSION

The effect of salt content on the conductivity is discussed on the basis of the number density, mobility and diffusion coefficient of charge carriers. The maximum conductivity of $1.49 \times 10^{-5} \text{ S cm}^{-1}$ was achieved for hexanoyl chitosan/PVC (90:10)-30 wt. % NaI.

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TROPICAL FLAVORED LIP BALM: RAISING AWARENESS IN USING NATURAL SKIN CARE PRODUCTS

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ABSTRACT

Many commercially sold lip balms in the markets contain harmful chemicals. These chemicals can be absorbed through the skin and carried by the bloodstreams throughout the body. The purpose of producing Tropical Flavored Lip Balm is to formulate safer and natural alternative to the commercially sold lip balms that may contained harmful chemicals. By formulating such lip balm it is hoped to create awareness among the consumers to use skin care products that contains natural ingredients that are safe to use. The lip balm is formulated using natural ingredients and contains tropical plants essential oils. This lip balm contains beeswax, cocoa butter, virgin coconut oil, aloe vera essential oil, papaya essential oil, Roselle essential oil and banana essential oil. These ingredients are safe and can contribute to the skin health, beauty and youthfulness. Promoting the lip balm via the social media has also helped to increase awareness for consumers to use safer and natural skin care products.

Keywords: Lip balm; natural ingredients; tropical plants extracts; essential oils; social media.

INTRODUCTION

Cosmetics is one of female all time consumers must have and wear in their daily life. Lip balm essentially is the beauty product that must be applied before lipstick. Though there are increased market in cosmeceuticals, it is still expensive and difficult to obtain lip balm derived from natural ingredients that are safe and free from chemical preservatives, such as parabens, or chemical that is parts of the lip balm ingredients, such as dexamethasone and hydrocortisone acetate (Barbulova et. al, 2015). Hence, a lip balm free from these chemicals must be developed to reduce personal exposure to possible endocrine-disrupting chemicals. Lip balm with natural ingredients will be a stepping stone for consumers to build their good health with the help of natural sources (Shivanand, 2010).

The first objective is to create a chemical free formulation using ingredients derived from tropical countries. The second objective is to use the social media as a platform in educating consumers in using safer skin care products.

MATERIALS AND METHOD

Lip Balm Preparation

Beeswax and cocoa butter were melted together in a beaker. Coconut oil was mixed together with Hibiscus rosa-sinensis extract. The melted beeswax and cocoa butter mixture was added together with the coconut oil and H. rosa-sinensis mixtures. Drops of Roselle, banana, aloe vera and papaya extracts were added to the liquid mixtures. All the ingredients were mixed thoroughly, poured into lip balm containers and were left to dry at room temperature.

Creating Social Media Account & QR Code Generation

An Instagram account entitled “Tropical Flavored Lip Balm” was created. Information regarding the benefits of each ingredients were uploaded into the Instagram account. Testimonial videos were also uploaded into the account. QR code was generated for the Instagram account using QR code generator. QR code image generated was incorporated into the lip balm container packaging box design.

Lip Balm Evaluation Survey

Samples of lip balm were given to 4 groups of potential consumers aged between 18 to 38 years old. Each group consists of 27 - 28 participants. The total number of participants were 111. The participants evaluated the lip balm based on its appearance, flavor, color and marketability. Data were recorded and analyzed.

RESULT AND DISCUSSION

The Tropical Flavored Lip Balm does not contain any potentially harmful chemicals. The lip balm contains natural ingredients that benefit the lips. It moisturizes the lips, repair chapped lips, and gives a glossy effect to the lips. The lip balm contains tropical plants extracts that has benefits towards the skin’s health. The lip balm contains ingredients that moisturizes and repair the skin.

The lip balm formulated is a red colored lip balm. The red colored lip balm is colored using extract from Hibiscus rosa-sinensis, which contains anthocyanin pigment which has antioxidant properties that will protect the skin (Voon et al., 2012).

The purpose of creating an Instagram account for the lip balm is to educate the consumer and raising awareness in using safer and natural skin care products. The lip balm is considered as safe because the plastic container of the lip balm is BPA free. BPA is Bisphenol A which is chemical found in most plastic containers. BPA is potentially harmful as it has the potential to cause cancers (Nordsnist, 2018). Most commercially sold lip balm in the markets contain potentially harmful chemicals such as parabens and mineral oils.

The Instagram account for the lip balm contains information regarding the benefits of every natural ingredients used to formulate the lip balm. Consumer could easily access this information by scanning the QR code found on packaging box using QR code scanning apps. It is straight away linked to the lip balm Instagram page. The lip balm Instagram has 88 followers now. One of the image has been received 382 likes and it was been viewed by

international viewers. Using this platform of social media makes our product easy to assess by anyone around the world.

Based on the numbers of followers and likes, this shows that our intention to educate consumers has been achieved. Promoting lip balm through the Instagram is an easier approach as it is free. The new generation today prefers the social media to get the latest information on the newest trends available in the market.

TABLE 1 Lip balm survey evaluation

Lip balm survey evaluation	Percentage (%)
Respondents like the lip balm packaging.	80.2
Respondents find the lip balm color is attractive and appealing.	86.5
Respondents find the lip balm scent is very pleasant.	87.4
Respondents would buy the lip balm.	83.8
Respondents find the lip balm Instagram informative.	93.7

Table 1 shows the results obtained from the survey that was carried out. From the survey conducted, a total of 80.2% respondents really like the packaging of the lip balm. A total of 86.5% respondents find that the lip balm color is very attractive and appealing. A total of 87.4% respondents find that the lip balm scent is very pleasant. The survey also found that 83.8% of the respondents would consider buying the lip balm and 93.7% of the respondents find the lip balm Instagram is informative in providing information regarding the benefits of the natural ingredients used to formulated the lip balm. Thus is has achieved the objective which is to rise awareness for people to use more safer and natural skin care product.

CONCLUSSION

Tropical Flavored Lip Balm has successfully been formulated using only natural ingredients. Promoting the lip balm via the social media has managed to raise awareness on the use of natural product which have the potential to be commercialized.

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