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Pusat Asasi UiTM

ASiDCON 2018 Proceeding Book

ASiDCON 2018
Proceeding Book

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CONTENTS

FOREWARD BY CHAIRPERSON

Assalamu'alaikum Warahmatullahi Wabarakatuh.

On behalf of the Centre of Foundation Studies, UiTM Selangor, Dengkil Campus, I am very pleased and honoured to announce that we have succeeded in organising our very first ASiD Conference (ASiDCON2018) on 27 November 2018 in spite of our busy and tight schedule. We have had two colloquiums since the Centre of Foundation Studies started to operate at Dengkil Campus in 2016. This year, we are transforming the event to a conference with an aspiration that we will be able to organise more conferences in the coming years.

With great pleasure, I would like to welcome and invite your participation to the ASiD-CON2018 with the theme, "Navigating the Future through Multidisciplinary Research". ASiDCON2018 will provide a platform for academics, researchers and professionals from various backgrounds and disciplines to share the latest findings (or expected results of research work and research progress) in their related fields. Additionally, ASiDCON2018 will also provide opportunities for participants to publish their extended abstracts in the proceeding book (with ISBN and copyright for the published work).

I hope that all participants will take full advantage of this event and the diversity of experiences to not only share knowledge but also to enhance collaborative efforts and strengthen networks to open up wider engagement in research activities. I take this opportunity to thank the presenters and participants who have shown such encouraging support for this event. I would also like to thank the organising committee for their resourcefulness and unrelenting effort in organising ASIDCON2018. I wish all participants to this conference a pleasant and fruitful conference.

Dr. Salizatul Ilyana Ibrahim
Chairperson
ASiDCON 2018

FOREWARD BY RECTOR

Assalamualaikum warahmatullahi wabarakatuh.

Dear Authors, esteemed Readers,

It is with great pleasure that I write this Foreword to the Proceedings of the inaugural ASiD Conference (ASiDCON2018) at UiTM Selangor, Dengkil Campus. ASiDCON2018 is a platform to bring together researchers, academics and professionals from various disciplines - Science & Technology and Social Sciences to share their findings and collaborate in multidisciplinary scholarly efforts.

The conference particularly will encourage the interaction between research students and early-career academics with the more established academic community in an informal setting to present and to discuss current and future work. The papers to be presented will contribute to the corpus of scientific knowledge in the field of Social Sciences and Humanities, Teaching and Education, Law in Society, Environment and Sustainable Development, Quantitative Methods, Policies and Religious Studies.

The proceedings will provide budding researchers and academicians with an excellent reference. I trust also that this will be an impetus to stimulate further research. This conference is definitely an excellent platform for academicians to broaden their research endeavours and contribute to UiTM's research output.

We thank all authors and participants for their efforts.

Professor Dato' Dr. Abu Bakar Abdul Majeed
Rector
Universiti Teknologi MARA Selangor

FOREWARD BY DIRECTOR

I would like to take this opportunity to welcome everyone to ASiDCON2018. Held at our very own Centre of Foundation Studies UiTM, Dengkil Campus, ASiDCON 2018 is the first of its kind, and it is an honour to be part of it. The conference themed 'Navigating the Future through Multidisciplinary Research' is a testament of the Centre's commitment to strive for academic vigour and to provide a platform for academicians and experts to share their research findings and achievements to allow for ideas to be explored and experience as well as expertise to be tapped into. This is in line with UiTM's mission to place the university on the global map.

Only by bringing together expertise from different disciplines can we provide a rich pool of ideas for participants to harvest from and apply to their respective research field. With new developments in every field, complex new issues begin to spring up as well, and only through collaboration and exchange of ideas can the new challenges be met head on. Oliver Wendell Holmes Sr. once wrote "Many ideas grow better when transplanted into another mind than the one where they sprang up." Today, I hope that you embody the spirit of his words; I hope that the researches shared can open up a new network of people who come together to generate ideas that will benefit the society as we move forward into the future.

By sharing research findings and having informed discussions with highly experienced and well-credentialed speakers, I am confident that UiTM, in particular the Center of Foundations will continue to be a leading provider of innovative and enterprising educational experiences.

On that note, I would like to thank all the keynote speakers, the plenary speakers, presenters and participants who have supported this event and have been willing to share their research knowledge and experience to all of us in this conference. I would also like to congratulate the organising committee whose commitment and tireless efforts have made ASIDCON2018 happen. May you all learn from each other here and may we all use that knowledge to better ourselves for the benefit of the nation and the world in the years to come.

Have a productive conference. Thank you.

Professor Dr. Saifollah Abdullah
Director
Centre of Foundation Studies

BEST PRESENTER

Farhah Abdullah

Non-Negotiated Small Print Clause: A Consumer Barrier For Protection?

Masnita Mat Jusoh

Electrical Properties of $BiFeO_3$ Nanoparticles Added $(Bi_{1.6}Pb_{0.4})Sr_2Ca_2Cu_3O_{10}$ Superconductor.

Siti Norida Abdul Kadir

The Awareness of Retirement Planning: Preliminary Study in UiTM Puncak Alam Kampus.

Irwan Affendi Md Naim

Utilizing Service Learning to Nurture Youth Philanthropy: The Humanity Paladins Initiative.

BEST PRESENTER

Noorazida Mohd Idris

Automating Goods to Pallet Assignment Process using Bin Packing Algorithm: A Prototype System.

Nur Fariza Abdul Rahman

Enzymatic-Catalyzed Production of Palm Oil Wax Esters in a Solvent-Free System.

Nurul Bazilah Abd Hamid

The Relationship Between Motivation and Willingness to Communicate in English: A Study of TESL Foundation Students in UiTM.

PLENARY 1

Navigating the Research Maze: Publish and Flourish

Professor Dr. Habibah Ashari

In the Old World order, academics were frightened by the old adage "Publish or Perish". Academics, especially those non-tenured, churn out paper after paper to meet the requirements of a promotion. And requirements of promotions frequently change with the times. There is never a level playing field. Whether they believe in their research, or have an interest in it, or even like it: all of this is not questioned. Doing research is not easy - you need knowledge, know-how, funding, equipment, perseverance, motivation, interest, and good team-work.

You also need advocates for your research - people who will guide, facilitate and encourage you to do research. In this paper, I would like to introduce the new adage "Publish and Flourish", an adage that is more encouraging and attractive, especially to novice researchers who are still figuring out the research world. Participants are introduced to the ins and outs of doing research, what constitutes good and useful research, the pitfalls of doing research, and how rewarding doing research can be. It is a maze, but a maze well-rewarded.

Biography: *Professor Dr. Habibah Ashari is a Professor of Education at the Faculty of Education, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor. She holds a PhD in Curriculum and Instruction and an MA in Applied Linguistics from Indiana University. Her research interest includes international and higher education, and 21st century education. She has held several important posts in UiTM, namely the Assistant Vice Chancellor of Institute for Leadership and Quality Management (iLQAM) and Director of International Education College (INTEC). Habibah was also the architect of the UiTM Holdings Sdn Bhd established in 2007. Her expertise led to her appointment as the 14th Distinguished Tun Abdul Razak Chair at Ohio University, Athens, Ohio in 2011.*

PLENARY 2

Importance of Natural Products in Medicinal Plants Studies

Professor Dr. Khalijah Awang

Malaysia is a highly diverse country both in terms of culture and its natural resources. It is one of the twelve world mega biodiversities; we actually host one of the oldest forests in the world! We inherited a rich culture of medicinal practices, including Malay traditional medicine which involves usage of plants like *tongkat ali, kacip fatimah, kunyit* and many others. This presentation will discuss briefly the work of IFM-NatPro Lab on known traditional medicinal plants for the treatment of various diseases such as diabetes, cancer and antifungal infections. In addition, studies of plants processing interesting biological activities will also be presented.

Biography: Professor Dr. Khalijah Awang is a Professor at the Department of Chemistry in the Faculty of Science, University of Malaya. She obtained her PhD from Universite Rene Descartes, Paris V, France. She has published over 260 academic articles including books and journals and her area of expertise includes natural products chemistry (Natural products, NMR, alkaloids, biological activity, QSAR). Her work is recognised internationally, leading to her being appointed as the Coordinator for the French Malaysian Scientific Collaboration Phytochemical Survey of Malayan Flora. Her excellence in the field of research was recognised when she was named the Top Research Scientist Malaysia (TRSM) 2014 by Akademi Sains Malaysia.

SCIENCE
&
TECHNOLOGY

The Catalytic Performance of Zn/ZnO/TiO$_2$ Plate on Aromatic Mixtures

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A B S T R A C T

Aromatic mixtures of benzene-toluene-xylene (BTX) are among the most prevalent and persistent pollutants in the environment that can only be treated by advanced photocatalysis. Today, most of the available photocatalyst are non-recycled due to lacks of proton-coupled electron transfer (PCET) agents introduced. Herein, binary oxides of ZnO/TiO$_2$ as the new PCET agent on zinc plate are used as photocatalyst for BTX. Remarkably, the freshly prepared Zn/ZnO/TiO$_2$ plate had degraded the BTX mixtures at 88% under UV-light for 180 minutes. On recycle used, the Zn/ZnO/TiO$_2$ plate had degraded more than 61% of the BTX mixtures. This indicates a stable photodegradation capability with approximately 83% of reusable capability using the Zn/ZnO/TiO$_2$ plate. Furthermore, addition of hydrogen peroxide, H$_2$O$_2$ as strong oxidant at 1.0×10^{-3} M had enhanced the percentages of degradation for BTX on Zn/ZnO/TiO$_2$ plate by 3%. It is suggested,that the presence of H$_2$O$_2$ had inhibits the electron-hole recombination process, which may split on homolytic cleavage that led to the increase in the concentration of hydroxyl radicals.

Keywords: Proton-coupled electron transfer, binary oxides, Zn/ZnO/TiO$_2$ photocatalyst, benzene-toluene-xylene (BTX).

1. INTRODUCTION

Aromatic mixtures of benzene-toluene-xylene (BTX) are well-known to cause contamination of soil and groundwater. Moreover, they are very toxic and caused diseases to human especially carcinogenic agents for cancer and tumors in kidney, liver, and other organs. Several methods have been used to remove the BTX pollutants but most of them only created new environmental problem such as air-borne contaminants. The most promising method of using photocatalytic degradation had promise an environmentally-friendly approaches due to complete mineralization of organic pollutants, by fast oxidation within few hours, without formation of harmful polycyclic by products and the readily presence of cheap catalysts that is adaptable to specially designed reactor

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systems. To achieve high performance of photodegradation process, electrodeposition of binary oxides with TiO_2 has been extensively studied as proton-coupled electron transfer (PCET) agents for the removal of organic pollutant such as BTX. Herein, the objective of this study is to prepare the binary oxides of Zn/ZnO on TiO_2 films using an electrodeposition technique and further utilized the film in the photodegradation of BTX. Moreover, this study has demonstrated the preparation of Zn/ZnO/TiO_2 films has acted as an effective PCET and has successfully photodegraded the BTX compounds.

2. METHODOLOGY

A 500 ppm BTX solution was stirred for 10 minutes to give a homogeneous concentration of sample in a square Pyrex reactor. Subsequently, a Zn/ZnO/TiO_2 plate was dipped into the reactor, before perfectly sealed with parafilm to avoid evaporation. To achieve physical absorption equilibrium, the sample was allowed to absorb on the surface of the photocatalyst for the first 30 minutes. In a few minutes, the sample was irradiated with UV lamp (6W, 354 nm) for the next four hours. To analyze the photodegradation process, the BTX solution was taken out by using dropper for every 30 minutes for 30, 60, 90, 120, 150 and 180 minutes. In every analysis, 3 mL of sample was taken out and the corresponding absorption was recorded by using UV-Vis spectrophotometer Shimadzu 2510PC. To eliminate interferences, the highest absorption was used as the constant wavelength and their subsequent percentage of photodegradation was further calculated. For comparison, the photodegradation of the sample solution was again conducted in the presence of oxidation agent of hydrogen peroxide (H_2O_2) at 1.0 x 10^{-3} M.

3. RESULTS AND DISCUSSION

The photo-degradation of BTX by using freshly prepared Zn/ZnO/TiO_2 plate and recycledZn/ZnO/TiO_2 plate under UV-light for 180 minutes was illustrated in Figure 1. It can be seen, the photodegradation efficiency of photocatalyst decreased when the same photocatalyst plate was used twice for photodegradation of BTX.The highest percentage of photodegradation of BTX by using fresh photocatalyst plate was 88.0% suggested the PCET agent presence in the plate system. In contrast, the photocatalytic activity of the photocatalyst was lowered when using recycled photocatalyst plate to only 61.49%. The photocatalytic efficiency was decreased for about 26.51% using recycle photocatalyst plate contributed to the lacks of PCET agents regenerated after the first catalytic cycled used.
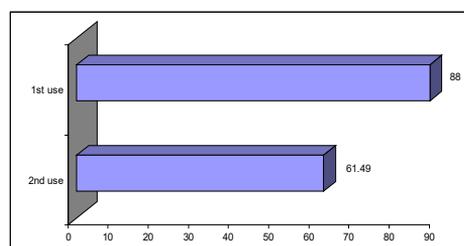
Figure 1: The optimum percentages of BTX photodegradation using fresh Zn/ZnO/TiO_2plate and recycled Zn/ZnO/TiO_2plate

It is postulated that, the decreased of the photocatalytic activity using recycled photocatalyst plate might attributed to some TiO_2 and ZnO particles that are leached-off from the film surface into the sample solution. This might be contributed by the pro-longed vigorous physical mixing of the sample solution using magnetic stirring. Notably, the amount of catalyst presence on the surface catalyst was reduced corresponding to the decreased in surface area of the catalyst which defect the photocatalytic efficiency as suggested

by Yassitepe *et al* (2008). In this case, the lack of formation for electron hole pair to give weaks radicals due to porosity choking had decreased the plate photocatalytic capability (Shifu and Yunzhang, 2007).The photodegradation of BTX sample solution was further evaluated by addition of H_2O_2 ($1.0x10^{-3}$M) in $Zn/ZnO/TiO_2/UV$ system. The effect on the addition of H_2O_2 in the BTX solution on the photocatalytic degradation of BTX was illustrated in Figure 2. It can be seen that by adding a small amount of H_2O_2 in the sample solution, the highest photodegradation percentages of BTX had increased slightly from 48.03% to 51.14%. It is worth noting that, H_2O_2 is considered as a strong oxidation agent and likewise the addition of H_2O_2 in the sample solution had enhanced the photocatalytic activity of $Zn/ZnO/TiO_2$ in degrading BTX. By considering the PCET mechanism, H_2O_2 had enhanced the formation of radicals on the photocatalyst surface and significantly increased the photocatalytic efficiency of the $Zn/ZnO/TiO_2$ plate in degrading BTX. As suggested by Teck (2008) that conducted a study regarding the effect of H_2O_2 oxidant to sample solution on the photocatalytic activity of Zn/ZnO plate. Nonetheless, the efficiencies of photo-assisted degradation of organic compounds had significantly improved in the presence of H_2O_2 to certain limits.
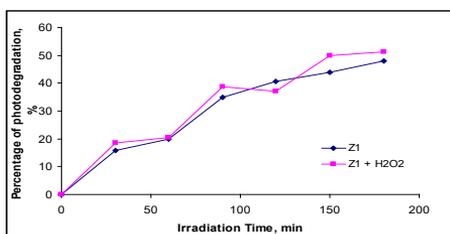
Figure 2: The effect on the addition of H_2O_2 in the BTX solution on the photocatalytic degradation of BTX

The addition of H_2O_2 has directly increased the concentration of hydroxyl radicals. Briefly, the presence of H_2O_2 inhibits the electron-hole recombination process and it may split to produce hydroxyl radicals directly under UV-light irradiation. The increased on hydroxyl radicals concentration contributed to the higher photocatalytic activity of the photocatalyst. However, if the amount of H_2O_2 addition is overdosed, it will retard the photocatalytic performance of the photocatalyst. This is in good agreement with findings from Jain and Shrivastava (2008) which suggested that the molar H_2O_2 concentration had significantly influence the degradation of organic compounds. This is because H_2O_2 concentration is directly related to the number of $OH^.$ radicals generated in a photo-assisted reaction (Jain and Shrivastava, 2008).

4. CONCLUSION

In summary, Zn/ZnO binaryplate is re-usable and demonstrate photodegradation by PCET on BTX mixtures. The experimental results showed that the degree of BTX degradation is also affected by the presence of oxidation agent of H_2O_2. The addition of low concentration ($1.0x\ 10^{-3}$ M) of H_2O_2 on the BTX sample solution, had promoted the photocatalytic efficiency of $Zn/ZnO/TiO_2$ in degrading BTX until a certain concentration limit.

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Development of Automated Examination Invigilation Scheduling System in Higher Education Institution

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A B S T R A C T

The manual examination invigilation scheduling system is still widely used in higher education institutions although it leads to a few problems pertaining time consumption. As part of its administrative functions, exam invigilation scheduling requires huge attention and needs to be catered professionally as it involves academic and non-academic staffs. The objective of this study is to design and implement a web-based automated platform for examination timetable system in Centre of Foundation Studies (CFS), Universiti Teknologi MARA (UiTM). The system discussed in this paper was developed using Macromedia Dreamweaver8 software for creating the websites while Microsoft SQL Server 2012 serves as the database to store all data and information required by the system. The programming languages used consists of HTML (Hypertext Markup Language), PHP version 7.2.4 (Hypertext Preprocessor), Javascript, CSS (Cascading Style Sheets) and SQL (Structured Query Language). PHP is a scripting language that is embedded in HTML. PHP scripting code is used to connect web pages to Microsoft SQL Server 2012 databases to create dynamic web sites. The system developed was successfully tested and able to generate individual examination invigilation timetable in a few minutes depending on the number of invigilators provided for examination invigilation. Once the system is implemented and adopted, it will solve many problems faced by manual scheduling such as time consumption, cost efficiency, clash in invigilators' schedule and fairness in invigilation hours.

Keywords: Examination, invigilation, automated scheduling, automated timetabling, automated system.

1. INTRODUCTION

Examination scheduling is sometimes a serious challenge in most higher education institution (Oluwaniyi, Afeni & Onyekwelu, 2016). Preparation of examination schedule including invigilation timetable is always time consuming, a waste of resources, liberation of energy and often leads to clash of time and venues. Even planning for the time table itself can lead to error and revision is always a must once the task is finished (Soyemi, Akinode, Appiah Osei & Oloruntoba, 2017). Examination

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invigilation system is a system that allows all staff whether academic or non-academic in university to generate their invigilation time table. Generally, the staff can view and print their timetable using the system anywhere as long as they have access to internet. Only system administrator can add, remove and reset invigilation timetable for all invigilators involved. Invigilation timetable should be carefully assigned into appropriate time-slots and venues for invigilators be it academic or non-academic staff (Fernandes, Pereira & Armando Barbosa, 2013). The examination invigilation timetable scheduling in CFS is done manually by the Examination Committees assigned by Academic Affairs Division. The process of preparing the system is in three phases namely data collection, data analysis and automated scheduling. Data collection process includes latest staff status, examination room and number of students for each examination room. The next phase is analysis of the data collected and setting up parameter such as the number of invigilator for each examination room and the number of time each staff given invigilation task. The last phase is the automated scheduling of invigilators into each examination room based on parameter set. Based on the analysis, the invigilator timetable is produced with four outputs namely course name, date of invigilation, examination room assigned and task assigned (head of invigilator/invigilator). In scheduling the timetable, the following constraints must be taken into consideration; no staff to invigilate more than one room at a time, no staff can be assigned more than numbers set up to invigilate, and the number of invigilators should not exceed the limit for each examination room.

2. METHODOLOGY

Macromedia Dreamweaver is a tool for creating the user interface in viewing and updating the information about the invigilation schedule while Microsoft SQL Server 2012 software is used to store all the information and it is a database for this system. The programming languages used consists of HTML (Hypertext Markup Language), PHP version 7.2.4 (Hypertext Preprocessor), Javascript, CSS (Cascading Style Sheets) and SQL (Structured Query Language). PHP version 7.2.4 is a scripting language that is embedded in HTML. PHP version 7.2.4 scripting code is used to
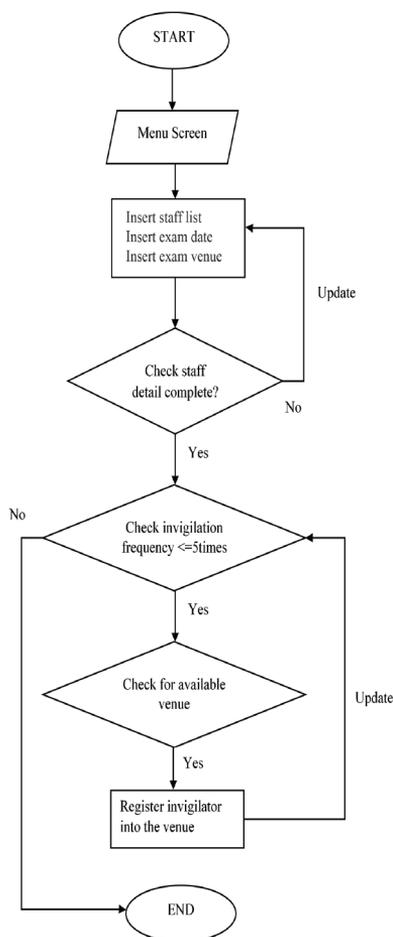
Figure 1: Flowchart of invigilator automated schedule system

connect web pages to Microsoft SQL Server databases to create dynamic web sites. Structure Query Language (SQL), the most common database language was used.

3. RESULTS AND DISCUSSION

Figure 2 below is the output of the system which is the university examination invigilation timetable highlighting the courses, time and the respective examination venues obeying all given constraints. It can be printed, distributed and uploaded on the university webpage for easy access. Basically, the first output of this system is login page. This system consists of three access levels which is administrator, lecturer and student. If the user is assigned as an administrator, they can have the administrative menu whereby this access qualifies one to add, modify and generate the timetable scheduling either manually or automatically. The rest can only view their invigilation timetable. On the login page, an authorized user has to log on to the system by typing their correct username and password. In this study, the researchers have produced an effective way of using the system compared with the manual process. The output of the system showed clear information of each date, time, class group, room and the names of invigilators. Furthermore, this system provided the online information where by all the students, lecturers and administrative staffs can access anytime and anywhere by using any electronic devices as long as they have an internet connection. In any case, by using this system, all information about examination timetable can be kept as achieve record for future references and can be accessed whenever needed.

4. CONCLUSION

Based on previous work and studies, it is confident to say that the invigilation timetable automated system is a future use for universities and colleges. Large population of students and staff can lead to increase time consumption and energy in preparing examination timetable. Thus applying automated system to randomly assign invigilators for any examination slots simplifies the task as the timetable can be generated instantly through the

Figure 2: Displaying All Invigilators in Invigilation Timetable Scheduling System

automated system developed. For future works, different variables will be taken into considerations such as quarantine section for certain staff to request for exception to be further studied in the near future.

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Morphology Study of Hexanoyl Chitosan-Based Nanocomposite Polymer Electrolyte System

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A B S T R A C T

Hexanoyl chitosan-based nanocomposite polymer electrolytes were prepared using solvent casting method. The effects of addition of dimethyl carbonate (DMC) as the plasticizer on the morphology properties of the prepared composite electrolyte system was investigated by X-ray diffraction (XRD). With addition of plasticizer, the crystalline nature of the polymer were found to be disrupted and tend to increase in amorphous phase as revealed by XRD diffraction.

Keywords: Hexanoyl chitosan, plasticizer, XRD.

1. INTRODUCTION

Solid polymer electrolytes (SPEs) have drawn keen interest due to their wide electrochemical application as it offers better mechanical properties, fair filmability and good contact with electrode materials (Kuo et al.,2013). Different approaches have been proposed to reduce the crystallinity and increase the amorphous phase in composite polymer electrolytes to increase the flexibility of the polymer hain in the electrolyte system hence resulting to an increase in the ionic conductivity. The addition of plasticizer such as ethylene carbonate (EC), propylene carbonate (PC) and dimethly carbonate (DMC) into the electrolytes systems is one of the conventional ways to reduce the

crystallinity and increase the amorphous phase in composite polymer electrolytes. In this paper, we reported the results of the investigations of the effects of DMC in changing the crystalline nature of hexanoyl chitosan-$LiClO_4$-TiO_2 electrolyte system.

2. METHODOLOGY

Lithium perchlorate ($LiClO_4$) purchased from Fluka AG was dried at 100^0C for 24 hours prior to use. DMC with purity 99% from Aldrich and tetrahydrofuran (THF) with purity > 99% obtained from J.T Baker were used as received. Hexanoyl chitosan that exhibited solubility in THF were prepared by acyl modification of chitosan. Details of preparation of hexanoyl chitosan were described by (Zong et al. 2000)

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Films of hexanoyl chitosan-based polymer electrolyte were prepared by the solution casting method. The X-ray diffraction (XRD) pattern of the electrolyte films were recorded with a X-Pert PRO XRD. The samples were scanned between 2θ angles of 5° to 80°.

3. RESULTS AND DISCUSSION

Figure 1 presents the XRD patterns of hexanoyl chitosan-LiClO$_4$-TiO$_2$ with various DMC compositions. The diffractograms of the present electrolyte system is characterized by a sharp diffraction peak in the small-angle regime and an amorphous halo in the wide-angle regime. The presence of amorphous halo implies that the electrolytes systems are amorphous in nature. The relative intensity of the sharp diffraction peak was also found to be DMC concentration dependent. These observations may suggest that the crystallinity of hexanoyl chitosan-LiClO$_4$-TiO$_2$-DMC system has changed.
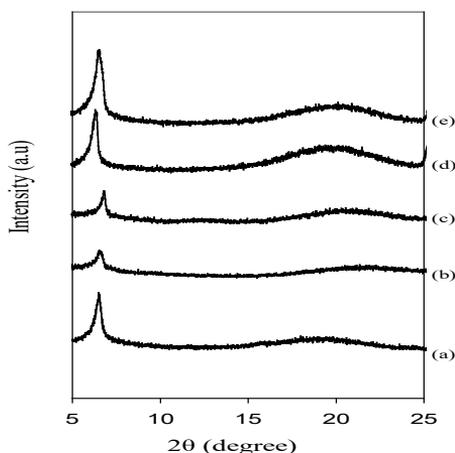
Figure 1: XRD spectra of hexanoyl chitosan-LiClO$_4$-TiO$_2$-DMC systems at DMC concentrations of (a) pure hexanoyl chitosan (b) 5 wt.% (c) 15 wt.% (d) 20 wt.% and (e) 25 wt.% DMC

Depicted in Table 1 is the variation of the degree of crystallinity and the ionic conductivity value of the sample as a function of DMC concentration. The degree of crystallinity was estimated from the ratio of the integrated intensity of sharp diffraction peak to the total integrated area of the spectrum:

$$Xc = \frac{I_c}{I_T}$$

where X_c is the degree of crystallinity, I_c and I_T are the sharp diffraction peak and otal integrated intensities. It is apparent from the Table 1 that there is a slight decrease in crystalline fraction with addition of DMC up to the optimum concentration. This indicates that the addition of the plasticizer can reduce the crystalline phase of the prepared samples. It is well known that the conductivity increases as the degree of crystallinity decreases. This is because rapid segmental motions of polymeric chain in amorphous region increase the mobility of the charge carriers leading to the higher ionic conduction (Muhammad et al., 2017). However, further addition of DMC concentration beyond this optimum concentration increases the crystalline fraction of the sample. This might be due to the saturation of DMC concentration. The changes in the crystallinity of the present electrolyte system may help to understand the variation in conductivity of the samples.

Table 1: The Variation in crystalline fraction and conductivity for hexanoyl chitosan-LiClO$_4$-TiO$_2$-DMC complexes as a function of DMC concentration

DMC concentration (wt.%)	Crystalline fraction (%)	Conductivity, σ (S cm^{-1})
0	8.1	3.06 x 10^{-4}
5	7.5	3.20 x 10^{-4}
15	6.8	4.09 x 10^{-4}
20	12.0	2.06 x 10^{-4}
25	12.8	1.86 x 10^{-4}

4. CONCLUSION

XRD results showed the effects of DMC concentration on the crystalline nature of hexanoyl chitosan-based nanocomposite polymer electrolytes. It is showed an increase in conductivity due to the decrease in crystallinity.

ACKNOWLEDGEMENT

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Digitalized Malay Traditional Neckline Stitches: Awareness and Appreciation of Malay Modern Dressmaker Community

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A B S T R A C T

In line with technology evolution, the Malay "baju kurung" has undergone many changes in form and meaning (westernization). The advancement of the current fashion has become a threat to the sustainability of the Malay traditional necklinestitches as this is the most complex hand-stitching technique. Hence, there is a significant need to conduct a study to preserve the traditional neckline handwork stitches mainly "Jahitan Tulang Belut" using multimedia application elements and make it remain relevant to modern society. This study examines the factors that make the Malay traditional neckline hand-stitches especially is unpopular among the dressmaker nowadays. A total of 30 dressmakers from the Malay Tailor Centre situated in Kuala Lumpur, Malaysia have participated in the survey. The data was gathered using survey and unstructured interview. Results show that public awareness and lack of expertise in teaching the traditional hand-stitches technique are two main factors that contribute to the diminishing skill of the "Jahitan Tulang Belut" among the dressmaker. In addition, 75% of these tailors support the idea of digitalization of the "Jahitan Tulang Belut" as a platform to preserve and rejuvenate the Malay traditional hand-stitches. Some cultural heritage conservation using multimedia application are also discussed, focusing on the new media which is accessible to the new generation.

Keywords: Neckline stitches, malay traditional, awareness, modern dressmaker, baju kurung.

1. INTRODUCTION

Malay community is dynamic and open, they accept the "newness" in their clothing to stay relevant and modern (Yusof, 2009). The modernization of Malay traditional cloth (baju kurung) is blended to selected elements which to accommodate with the current context. Some dressmakers still in-corporate the traditional element in making the baju kurung such as "kekek", "pesak" and "tikam belut". But some designer opts to style the cloth according to the current trends (Mustapha, 2017). As a result, the complex and time-consume of neckline stitches but has rich in Malay aesthetic of women handworks is the most Malay traditional element been omitted and modified (Hassan, 2016).

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"Tulang belut" the technique for neckline stitches are rarely used nowadays, due to its complicated and time-consuming stitching. Instead, many contemporary designs use piping, lace or beading as finishing and decorations on the "baju kurung" neckline. This probably due to, the knowledge required to practice this traditional neckline stitches can be difficult to articulate to novices. However, learning craft such as knitting stitches which previously its best learning method is face to face has used various kind of multimedia that being represented online (Torrey, Churchill, & McDonald, 2009). Many researchers (Aris 2016, Hassan 2016, Alias & Nawawi, 2003) are interested in the evolution of Malay traditional but based on the LR we conducted, the topic on how to preserve the Malay traditional neckline stitches using interactive multimedia virtualization techniques is not in the current research view. Hence, this research aims to examines the factors that make the Malay traditional neckline hand-stitches especially "Jahitan Tulang Belut" is unpopular among the dressmaker and their appreciation towards the digitalization of this traditional hand-stitches.

2. METHODOLOGY

This research involved30 Malay dressmakers as the sample respondent which located at Pasar Rakyat, Bangunan MARA, Kuala Lumpur. Pasar Rakyat provides a retail space which using a concept of incubator that accomodates 57 tailors with the size of 129 to 161 square meter each. Based on somebackground study, all these tailors have more than 5 years experienced in making modern and traditional garments. The tailors were given a 2 pages questionnaire and required to complete it. The questionnaire consists of 3 sections; section one is about the socio-demographicinformation of respondents; second section included questions about the respondents perception and experience towards traditional neckline stitches and the third section is asked repondents about their learning method of "Jahitan Tulang Belut". Then, during the collection of the questionnaires, the tailors has been interviewed by the researcher on their perception towards the digitalization of the Malay traditional neckline stitches .

3. RESULTS AND DISCUSSION

Among the respondents which are the tailor by profession, there was 65.8% of them are expert with more than 5 years experienced in the field. Almost all of the repondents which is 95% are aware that the "Jahitan Tulang Belut" is a Malay traditional hand-stitches that must be preserved and teach to the young generation. But only 19% of them make a Baju Kurung (for ladies) or Baju Melayu (for men) that apply the "Jahitan Tulang Belut" for the last 6 months of the year 2018. This is due to the some of the reasons highlighted by the respondents such as "... *cost is higher, due to limited skilled labour*" and "..*extra man-days needed*". In addition, only 25% of the respondents not agree and believe that digital platform can overtake the face to face teaching method in educate novice tailor about the traditional hand stitches in this case is the "Jahitan Tulang Belut". However, 75% of the tailors are agree and support the idea of transformation of "Jahitan Tualng Belut" techniques to virtual new-media, which can attaract young generation to learn the tradtional hand-stitches.

4. CONCLUSION

The research process disclosed the need of revitalization of Malay traditional neck-

line hand-stitches. The digitalization of the hand-stitches by using virtual new-media has been proposed and accepted by majority of this research respondent which is a tailor by profession with more than 5 years experienced. Two factors have been identified as the cause of the nearly no demand for the "Jahitan Tulang Belut" which are the public awareness and lack of expertise to teach the techniques of Malay traditional neckline stitches. Hence, the new design of education tools using new-media technology is needed to fill the gap. Such application can act as assistance to the novice or young tailor to learn the Malay Traditional Neckline Stitches and also preserve this valuable heritage technique digitally. The virtual new-media can be explored more for other valuable heritage conservation and generate public awareness.

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Towards Extended Crowdsourcing: An Understanding From the Islamic Perspective

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A B S T R A C T

Crowdsourcing is a term introduced pertaining to an individual or organizational effort that drives its activities on crowd contributions basis and is mobilized through the use of Internet technology. The intended activities are not only limited to crowd funding, crowd creation, and crowd voting. Crowdsourcing has become a phenomenon and it will continue to grow but at the same time lack of its own fundamental theoretical framework. Therefore it is suggested that there is a need for the crowdsourcing to have its own fundamental knowledge that is applicable as a contemporary reference. Thus, this article is subject to references in Islam but limited to the Qur'anic references, with the initial purpose of explaining how the crowdsourcing activities can render verses of the Qur'an as the foundation of its theoretical framework. Under this circumstance, the study method is limited to only identifying the verses of Al Quran that coincide with the basic components of crowdsourcing, necessitating to the progressive formation of Islamic-based conceptual model of crowdsourcing. Therein, it is hoped that the fundamental concept model of crowdsourcing can be strengthened with more accurate and developed methods particularly Maqasid aAl-Syariah in addressing the problems that arise in the field of crowdsourcing.

Keywords: Crowdsourcing, islam, conceptual model, framework.

1. INTRODUCTION

Crowdsourcing is an activity mobilized through crowd contributions attracts wide spread of researchers. Crowdsourcing is a term introduced pertaining to an individual or organizational effort that drives its activities on crowd contributions basis and is mobilized through the use of Internet technology. Since the activity of the crowdsourcing is organically moving, there are various definitions presented through various studies (Estellés-Arolas & González-Ladrón-De-Guevara, 2012; Hossain & Kauranen, 2015). However, the basic component of the crowdsourcing does not escape the original idea presented by Howe (2006), the crowdsourcer or crowdsourcing initiator, crowdsourcing activities, and nonetheless are the crowd themselves as in Figure 1. Whilst the source of crowdsourcing activity can consist of various forms of application depending on the needs of the crowdsourcer, crowd may contribute their ideas, skills, opinions, money or the like that can solve their
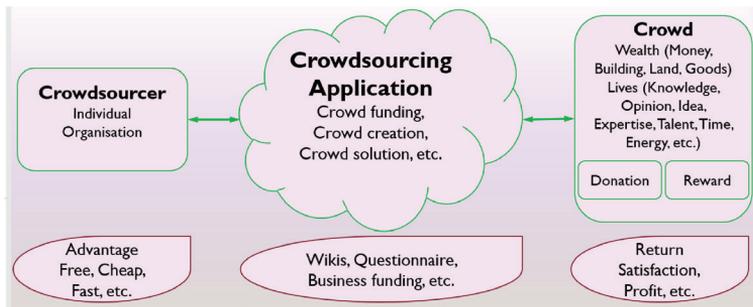
Figure 1: Crowdsourcing components

problems. Whatever type of contributions, crowd can comprise two groups, based on donations, and reward (Hasan & Sulaiaman, 2016). Among of the croudsourcing applications are idea generation, micro-tasking, open source software, public participation, people's science, citizen journalism, and wiki websites (Hossain & Kauranen, 2015). Considering that the concept of crowdsourcing has become a phenomenon and will continue to grow, there is a need for crowdsourcing to have its own core of knowledge due to the lack of its own fundamental theoretical framework (Estellés-Arolas & González-Ladrón-De-Guevara, 2012; Ghezzi *et al.*, 2018; Hossain & Kauranen, 2015; Tripathi *et al.*, 2017; Zhao & Zhu, 2014) that can then be used as a contemporary reference without relying on concepts and models of knowledge from other fields.

2. METHODOLOGY

These are several main sources of references in Islam namely Al Quran, Al Sunnah, and Ijtihad (Ab Majid & Ismail, 2012; Buang & Ramli, 2014; Mamat, 2015). With regard to this, the basis of reference sources is limited to the Al Quran alone, while Al Quran Translation in use are *"Tafsir Pimpinan Ar-Rahman"* translated by Sheikh Abdullah Basmeih (1995) and "Translation of the Meaning of the Quran" translated by Saheeh International - Jeddah (1997). Yet,

if there is a Qur'anic verse that needs to be explained and the method used is limited to the interpretation of the Quran with other Quranic verses (Yusoff, 2015). Adding to that, the book of Quranic interpretation or *"tafseer"* is also used for the purpose of explaining the meaning of the Qur'anic verses in conjunction with the concept of crowdsourcing. There are four *tafseer* books used which are *Al-Jalalain* (Al-Mahalli & As-Suyuthi, 2012), *Fi Zilalil Quran* (Quthb, 2002), *Al-Munir* (Az-Zuhaili, 2016), and Al-Azhar (Hamka, 1982).

3. RESULTS AND DISCUSSION

The word crowdsourcing is not a word that can be found directly in the translation of the Quranic verses. However, based on the discussion in the introduction section, crowdsourcing can be summarized as a method to enable an individual or an organization to perform a mission or to solve each problem by crowd's contribution in the form of ideas, energy, money or property acquisition through, none other, but the communication technology medium or Internet. The crowdsourcing terminology initially claimed introduced by Howe (2006) is known to the concept of helps each other where in Islam upholds the concept of *"ta'awun"*.

One of the Qur'anic verses that can be used as a reference source for

crowdsourcing is as the word of Allah Ta'ala in *surah* Al-Ma'idah (5: 2):

"...And cooperate in righteousness and piety, but do not cooperate in sin and aggression. And fear Allah ; indeed, Allah is severe in penalty."

Likewise the word welfare or "*al-birr*" is further explained in surah Al-Baqarah (2:177):

"Righteousness is not that you turn your faces toward the east or the west, but [true] righteousness is [in] one who believes in Allah, the Last Day, the angels, the Book, and the prophets and gives wealth, in spite of love for it, to relatives, orphans, the needy, the traveler, those who ask [for help], and for freeing slaves; [and who] establishes prayer and gives zakah; [those who] fulfill their promise when they promise; and [those who] are patient in poverty and hardship and during battle. Those are the ones who have been true, and it is those who are the righteous."

The next verse is from surah Al-Hajj (22:77) which means:

"O you who have believed, bow and prostrate and worship your Lord and do good - that you may succeed."

The previous figure of crowdsourcing represents the relationship between crowd and crowdsourcer to succeed any crowdsourcing activity. After reviewing different *Tafseer* books regarding the three selected verses and they are from *surah* Al-Ma'idah (5: 2), Al Baqarah (2: 177), and Al-Hajj (22:77), these versus are applicable to the concept of crowdsourcing. In fact, all of the particular versus from the Al-Quran provide more information that are not limited to the several components of crowdsourcing which has been discussed previously. Generally, a verse from surah Al-Ma'idah 5:2 provides a guide for crowdsourcing activities which is the direction of the act of mutual assistance, and the nature of the act of mutual assistance ie kindness or virtue and not the vice or sin and to be devoted to Allah. It is then necessary to explain what is meant by *"al-birr"* in crowdsourcing activity, in line with Allah decree in surah Al Baqarah (2: 177) for there are many things which are meant as *"al-birr"* but this study limits the meaning of "al birr" to:

"... but [true] righteousness is ... gives wealth, in spite of love for ... to ... those who ask [for help... Those are the ones who have been true, and it is those who are the righteous."

The paragraphs of the sura of Al Baqarah (2: 177) can be discussed from five
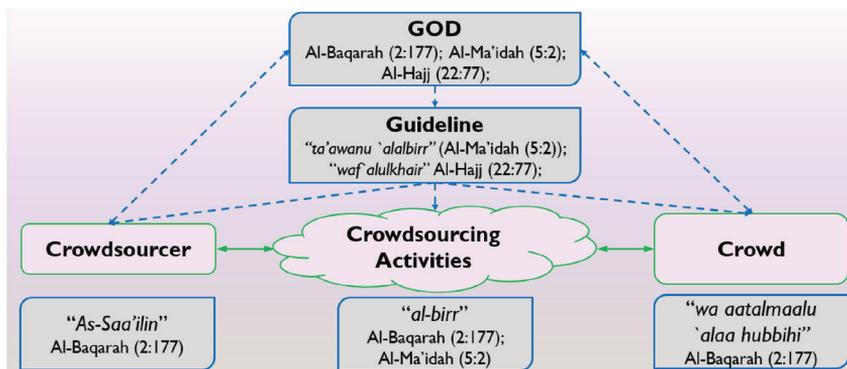
Figure 2: Islamic crowdsourcing conceptual model

main points; the interpretation of *"al-birr"* in general, those who contribute (the crowd), the characteristics of the best contribution, the three who ask (the crowdsourcer), and the character of *"Al-Muttaqin"*. Both versus do not only show the relationship between human and human but also the relationship between human and God while doing good deed to people.

4. CONCLUSION

Based on the discussion in this study, it is justifiably to propose a conceptual model of an Islamic-based crowdsourcing. The conceptual model highlights the relationship between the crowd and crowdsourcing activities involved, as well as how the relationship between mankinds and their creator comes to light. In other words, crowdsourcing activity is a form of alliance based on the Quranic guidelines. The next phase of this concept model will look into the application of Maqasid Al-Syariah in crowdsourcing before having round-table discussion with eminent Islamic scholars on its far fetched adoptions in accordance to the Islamic-based fundamental theories.

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Conductivity Enhancement in Terms of Structural Properties of Titanium Phosphate using Mechanical Milling Method

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A B S T R A C T

This study involved the fabrication of lithium ion solid electrolyte in the $Li_2O\text{-}TiO_2P_2O_5$ (LTP) system. All samples were prepared using mechanical milling (MM) method. The precursor $TiO_2\text{-}P_2O_5$ (TP) system were first fabricated and characterized by Electrochemical Impedance Spectroscopy (EIS), X-Ray Diffractometer (XRD), Field Emission Scanning Electron Microscope (FESEM) and laser particle sizer. The highest room temperature conductivity was obtained for 60 wt. % of TiO_2-40 wt. % of P_2O_5 (TP 40) and TP 40 sintered at 900 °C (TP 900) with values of 3.18×10^{-7} Scm^{-1} and 8.13×10^{-7} Scm^{-1} respectively. XRD studies showed presence of TiP_2O_7 peaks in the diffraction pattern of TP 40 as well as TP 900. New peaks observed when the sample undergo MM method and given certain heat treatment. FESEM micrographs showed agglomeration of the samples as the sintering temperature changed indicating availability of big and small grains. Small grains increased as sintering temperature increased. The size of the particle of the TP samples were estimated to range from 0.70 μm to 3.01 μm for sintered and unsintered samples.

Keywords: Mechanical milling, morphology, grains, sintering temperature.

1. INTRODUCTION

Lithium ion secondary batteries suffer from problems such as flammable inorganic solvent in the electrolytes and loss of lithium ion due to evaporation (Song et. al, 1999). Therefore, introducing solid electrolyte as a separator is a suitable alternative to overcome these problems as it is also thought safer to prevent leakage and ignition. These electrolytes known also as superionic solids or fast ion conducting solids (FICS), is suitable for portable electronic devices as it have high energy density, light weight and long lasting performance (Ramesh et, al, 2000). Nowadays solid electrolyte materials include polycrystalline materials, polymer materials, glasses and glass-ceramic materials (Mohamed et. al, 2000). Among these electrolytes, glass-ceramics is a great potential to be used as solid electrolyte due to several reasons. They have high

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conductivity, low activation energy and maybe prepared by several methods such as solid-state reaction method, sol-gel method, combustion method, melt-quenching method and milling method. In this paper, lithium ion conducting glass-ceramic electrolytes will be prepared through mechanochemical milling method. The method is used as it is thought to produce fine powders (Schoonman, 2003 and Lee et. al, 2003). Fine powder will increase the interfacial contact between electrode and electrolyte which in turn will enhance the conductivity of the electrolyte (Manthiram et. al, 2003) due to increase in the formation of conducting pathways between the interfaces. In this work, preliminary studies on the system TiO_2-P_2O_5 will be carried out to determine the effects of heat and mechanical milling treatment on the conductivity of the sample for various composition of P_2O_5. Li_2O will be added to the highest conducting TiO_2-P_2O_5 sample to prepare Li_2O-TiO_2-P_2O_5 system for a fixed composition of TiO_2-P_2O_5. The system Li_2O-TiO_2-P_2O_5 will be characterized for its ionic conductivity. Studies on the ionic conductivity and structure of this system is reported.

2. METHODOLOGY

In this work, lithium based glass-ceramic electrolytes were prepared by the mechanochemical method in order to produce fine powders at room temperature. First and foremost, Titanium Oxide (TiO_2) and Phosphorous Pentoxide (P_2O_5) were mixed together in different compositions before thoroughly mixing them together by planetary ball milling (Fritsch Pulverisette 7) for 2 hours at 400 rpm and pressed to form a pellet at 800 Psi. After that, the mixture is sintered at 250 °C. The sintered pellets were then characterized using Electrochemical

Impedance Spectroscopy (EIS) to optimize the composition for highest conductivity at room temperature. The best composition was then added with Lithium Oxide (Li_2O) at different compositions and tested for EIS. The ternary system was then sintered between 300 °C to 1000 °C for 8 hours. The best conductivity of Li_2O-TiO_2-P_2O_5 system was characterized by EIS, Analysette 22 NanoTecLaser Particle Sizer and XRD. Electrochemical impedance spectroscopy characterization was carried out using the HIOKI 3532-50 LCR Hi Tester in the frequency range of 100 Hz to 5 MHz at room temperature. In the case of temperature dependence of conductivity impedance data were collected from room temperature to 120 °C.

3. RESULTS AND DISCUSSION

Figure 1 illustrates the X-ray diffractograms of as-prepared TP system. The figure shows the presence of TiP_2O_7 conducting phase in all samples. A new TiP_2O_7 peak is observed at 2θ = 52° in TP 40 sample indicating an increase in the amount of conducting phase in this sample. The intensity of the diffraction peaks are observed to increase with increasing in P_2O_5 content indicating the increase in crystallinity. Traces of Ti_3O_5, Ti_2O_3 (Xue et. al, 2009) and TiO_2 (Cheng et. al, 2012) impurities are observed for all samples. According to Aravindan (2011), conducting phase of TiP_2O_7 manifests itself when the concentration of P_2O_5 increases. The results observed here are also consistent with those reported by Kobayashi (1999). One unidentified peak at 2θ = 25° seem to decrease in intensity as P_2O_5 content increases while another unidentified peak at 2θ = 23° seem to increase in intensity as P_2O_5 content increases. The peak at 2θ = 25° may be due to unreacted TiO^2 (Fu, 1997) while that at 2θ = 23° may be due to impurity.
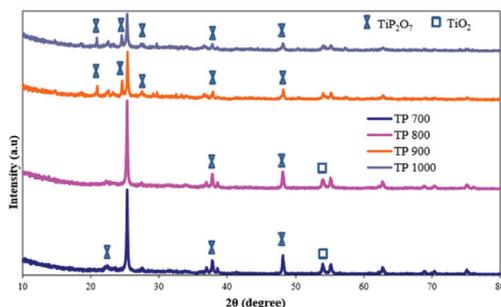
Figure 1: X-Ray Diffraction pattern for heat treated TiO_2-P_2O_5 system

Figures 2 (a) to (d) illustrates the FESEM micrographs for all unsintered samples. The non-sintered samples is mostly composed of grains with different sizes ranging from 0.1 µm to 2.0 µm. All micrographs also show agglomeration of grains with no pores and cracks. As P_2O_5 content increases the sharp pin like structures also dissappeared. This is due to mechanical milling method which causes the material to collide due to a very high rotation rate. As the weight percentage of P_2O_5 increases, the agglomeration of small grains increases

(Duclot et. al, 2001). The agglomeration of big grains and the number of small grains is very obvious especially for samplesTP 25, TP 40 and TP 45. In TP 40, small grains is observed to increase at the right side of the figure while the big grains were found to decrease in number. According to Xu (2006) and Takada (2001), small grains give better pathway for ions to hop. The increasein the number of small grains also indicates the increase in nucleation centres for crystal growth (Leo, 2002).

Particle size is one of the factors that could attribute to better morphology and electrical properties in the system (Fu, 1997). In the TP system, the crystallite size of the sample with the most conducting phase, TP 40, was found to be about 3.08 µm while for the heat-treated sample, the average crystallite size achieved was about 0.70 µm. Table 1 shows the particle size of TP system for both as-prepared and heat-treated samples respectively. The table shows that TP 40 has the smallest particle size in the case of
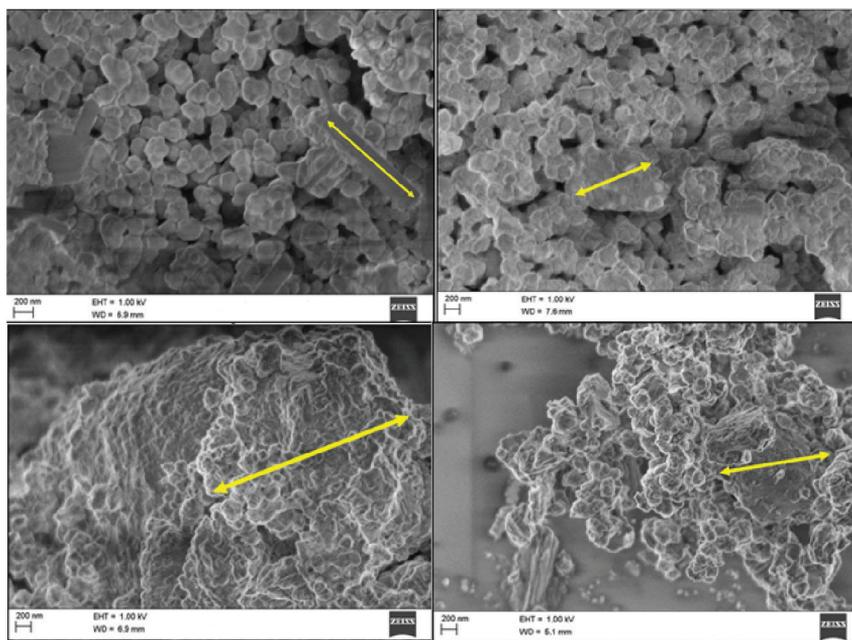
Figure 2 (a) to (d): FESEM images for TP15, TP25, TP40 and TP45

unsintered samples, while TP 900 has the lowest particle size for the sintered samples. In the case of unsintered samples, TP 40 has more peaks attributed to the conducting phase, TiP_2O_7 as shown in Figure 1. This accounts for its small particle size which is consistent also with the results presented in the micrographs. Themicrographs showed that TP 40 has the smallest grain size while for the heat treated sample, TP 900 have smaller grain and particle size due to agglomeration.

Table 1: Particle size of TP System at varoius composition

Sample	Particle size (µm)
TP 5	2.98
TP 10	3.99
TP 15	3.00
TP 20	2.99
TP 25	2.95
TP 30	2.92
TP 35	2.90
TP 40	2.80
TP 45	2.90

The graph of conductivity against composition of P_2O_5 in the TiO_2-P_2O_5 as prepared system is shown in Figure 3. It shows that the optimum composition for highest conductivity in the TiO_2-P_2O_5 system was obtained for the sample with 60-40 wt.% ratio (TP 40) with a value of 3.18 x 10^{-7} Scm^{-1}. This sample has the most amount of conducting phase with the smallest grain size and particle size. Hence its conductivity is high due to increase in surface area of the particle that makes it suitable for ions to hop. The conductivity also increased due to undistinguishablegrain boundary that improved the electrical properties of the sample (Fu, 1997). At this point, however, the ion involved in the conduction is most probably Ti^{4+} which accounts for its low conductivity due to its large size.

4. CONCLUSION

In this study, Li_2O-TiO_2-P_2O_5 (LTP) samples prepared by mechanical milling were
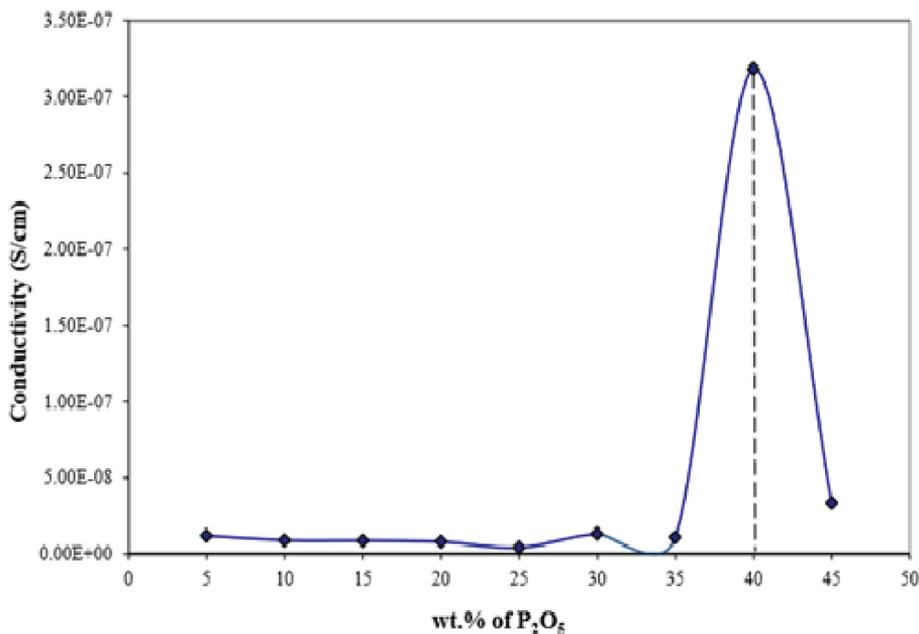
Figure 3: Graph of conductivity against different samples at room temperature

studied. Pellets of LTP were successfully prepared using mechanical milling method with constant parameters of milling time of 40 hours at 600 rpm. The precursor system of TiO_2- P_2O_5 (TP) obtained a conductivity of 3.18 x 10^{-7} Scm^{-1} for TP 40 at room temperature and was characterized by using XRD, FESEM, and Laser Particle Sizer. TP 40 has the most conducting phase with morphology consisting of TiP_2O_7 peaks and reduced particle size down to 0.7 µm. TP 40 was sintered at different sintering temperatures and achieved optimum conductivity at 900 ºC (TP 900) with a value of 8.13 x 10^{-7} Scm^{-1}. The enhancement in conductivity is due to increase in the conducting phase and increase in number of small grains in the morphology of the sample.

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Facile Rice Starch-Templated Synthesis of Nanostructured Metals

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A B S T R A C T

Synthesis of nanostructured metals is never straightforward and usually tricky with the compulsory use of complex polymer surfactant. To date, polymer surfactant are only produce from non-renewable resources that are hazardous and toxic. To provide an eco-friendly and facile route, we synthesized the nanostructured of hematite and silica using rice starch-templated synthesis. The rice starch-templated synthesis had successfully produce both hematite and silica with nano-sized and high surface area as compared to their coventional metals, respectively. In particular, the nanostructured hematite had a spherical-shaped particle morphology with average size of 24 to 48 nm , and surface area of 20.04 m^2/g. On the other hand, the nanostructured silica had a pseudo-spherical morphology with nano-sized from 13 to 22 nm, and surface area of 538.74 m^2/g. More importantly, the used of rice starch-template for a greener approach in the synthesis of nanomaterials without the use of polymer surfactant have been outlined.

Keywords: Green synthesis, nanostructured hematite, porous silicate, starch-templated synthesis, nano-sized materials.

1. INTRODUCTION

Nanostructured metals are one of the special structures that led to the enhancement of properties that are not available for any other dense metals. In recent years, a variety of synthesis methods such as sonochemical route, sol-gel process, surface polymerization processes, and template assisted approaches have been used for the fabrication of metals with nanostructured properties (Zhu et al., 2017; Zan, G., & Wu, Q. ; 2016). Among these methods, template-assisted approaches are considered as most effective and very efficient method for the preparation of nanostructured metals. In this method, various templating agents are used in the form of complex polymer surfactants such as polymethylmethacrylate (PMMA), polystyrene (PS) latex, and n-propyl amine that are not only non-environmental friendly but also industrial chemicals that are hazardous and toxic (Hao, N., Jayawardana, K. W.,

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Chen, X., & Yan, M.; 2015). To provide facile and eco-friendly approaches, starch has been successfully demonstrated as green templates for the synthesis of nanostructured metals. In this way, the heavy usage of polymer surfactants could be avoided and benign reagents from biomaterials are successfully introduced. In the case of starch structures, it is composed of linear amylose and branched amylopectin structures, which have hydroxyl (OH) and alcohol (COH) as its functional groups. Previously, the OH and COH groups were recognized in facilitating adsorption of the desired precursors onto their reactive surfaces, for the synthesis of different nanostructured materials (Zhang, B., Davis, S. A., & Mann, S.; 2002). Despite this interest, never before, to the best of author's knowledge, researchers had utilized starch for the synthesis of transition metals and metalloids. Herein, an eco-friendly and facile route for the synthesis of nanostructured of both hematite and silica using rice starch as a promising biomaterials template are presented.

2. METHODOLOGY

All reagents used in the study were used as received from analytical grade reagents. Rice starch (RS) of 99.9% purity was purchased from Euramco (M) Ptd Ltd., Johor, Malaysia.

Preparation of Nanostructured Hematite (HNS)

Typically HNS was synthesized according to a calculated composition of H_2O:HCl:RS:$FeSO_4.7H_2O$ at 1:0.002:1:4 as presented elsewhere (Matmin, J., Affendi, I., Ibrahim, S., & Endud, S.; 2018). Firstly, an appropriate amount of $FeSO_4.7H_2O$, HCl and RS were added to double distilled water, heated to 70 °C and constantly stirred

for 1 h. Afterward, the mixtures were left to room temperature before being filtered, washed with double distilled water and dried in an oven at 100 °C. Subsequently, the composites was heated to 700 °C (heating rate of 5 °C/min) and maintained, before slowly cooled to room temperature to give reddish-brown powder of HNS.

Preparation of Nanostructured Silicate (SiNS)

Typically SiNS were synthesized according to a calculated sol-gel composition of TEOS:H_2O:HCl:CH_3CH_2OH at 1:4:0.01:3 as established in the earlier report (Matmin, J., Affendi, I., & Endud, S.; 2018). Firstly, TEOS was added to an alcoholic acidified solution in the presence of hydrolyzed RS (38 wt %) at 60 °C for 6 h. The composites was then calcined at 550 °C to give opal-white colored of SiNS.

Characterization

For both samples, the morphology of both particles were observed using field emission scanning electron microscopy (FE-SEM). Moreover, AUTOSORB-1 Quantachrome volumetric adsorption analyzer by using nitrogen as the adsorbate at 77.35 K for full-scale adsorption-desorption for nitrogen adsorption-desorption measurement is also performed. To quantify, a Barrett–Emmett–Teller (BET) model was used to calculate the specific surface area and a Barrett–Joyner–Halenda (BJH) model was used to calculate the pore volume distribution and the average pore size.

3. RESULTS AND DISCUSSION

Rice starch-templated synthesis

The aim of this study was to prepare nano-

structured metals of both silica transition metals and metalloids. To fulfill that aim, two synthesis methods represent by Route 1 and 2 that consisted of two synthetic preparations were designed, as shown in Figure 1. To illustrate, the starting precursor of rice starch and hydrolysis of rice starch are denoted as RS and HRS, respectively (Scheme 1 in route 1). Subsequently, aqueous ethanol (EtOH) and tetraethyl orthosilicate (TEOS) were added to the HRS for complete oligomerization of TEOS into a sol-gel paste, which is referred to as SG-HRS before calcined to produce nanostructured silica (SiNS) powder (Scheme 2 in route 1).

As seen in Figure 1, the hematite was synthesized according to Route 2. Likewise, in Scheme A, an appropriate amount of $FeSO_4.7H_2O$, HCl and RS were added to double distilled water heated to 70 °C. In the next step, the mixtures were left to room temperature before being filtered, washed with double distilled water and dried in oven at 100 °C overnight to produce a dark paste of RS-HNS. This was immediately followed by calcinations of the paste to 700 °C (heating rate of 5 °C/min), before slowly cooled to room temperature (Scheme B) and finally, the reddish-brown powder of nanostructured hematite was collected as HNS.
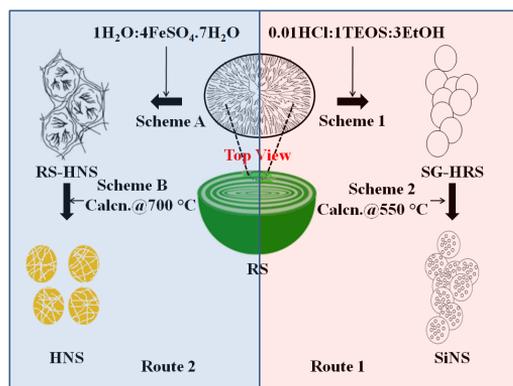
Figure 1: Facile rice starch-templated synthesis from Route 1 of SiNS and Route 2 of HNS

Morphology study

For morphology comparison, Figure 2 shows the FESEM micrograph for the synthesized metals of SiNS and HNS. In Figure 2(a), the FESEM micrograph image shows loose aggregation of pseudo-spherical morphology for SiNS. From the FESEM image, SiNS were measured in the range of 13 to 22 nm diameters. It is worth mentioning that partial macro-phase separation during the aging of sol-gel process and subsequent sintering effect during calcination at high temperature had affected the SiNS uniformity. In contrast, the HNS revealed highly uniform, almost mono-dispersed and spherical-shaped nanoparticles as shown in Figure 2(b). Based on the FESEM image, HNS were having spherical nanoparticles with sizes from 24 to 48 nm. The steady growths of the hematite are deduced to uniformly nucleate which eventually form well ordered spherical structure of HNS. However, there is still a present of small agglomerations that affect the HNS dispersity. Judging from FESEM images, it can thus be suggested that the SiNS from SiO_4 frameworks is loosely nucleated, growth, and aggregated together in the presence of RS. The weak interactions might be inherited from the nature of silica (Si) having metalloids or semi-metals characteristic which hindered the formation of ordered nanoparticles. In contrast, Fe precursor was strongly bound by metallophilic interactions to give closely packed Fe_2O_3 nanoparticles in the RS. These special interactions had promoted the formation of well ordered of spherical HNS.
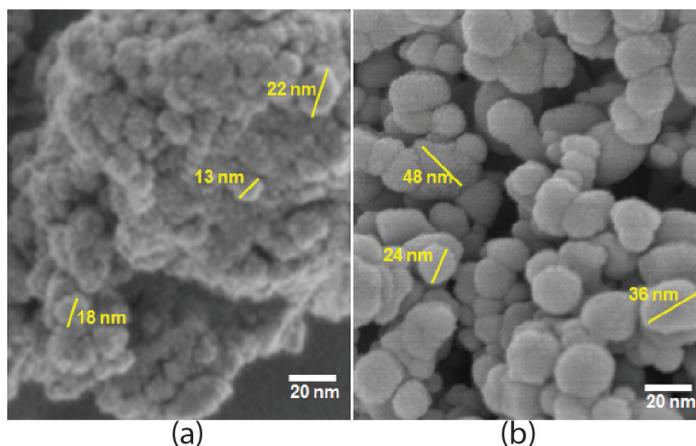
Figure 2: FESEM micrograph for (a) SiNS; (b) HNS
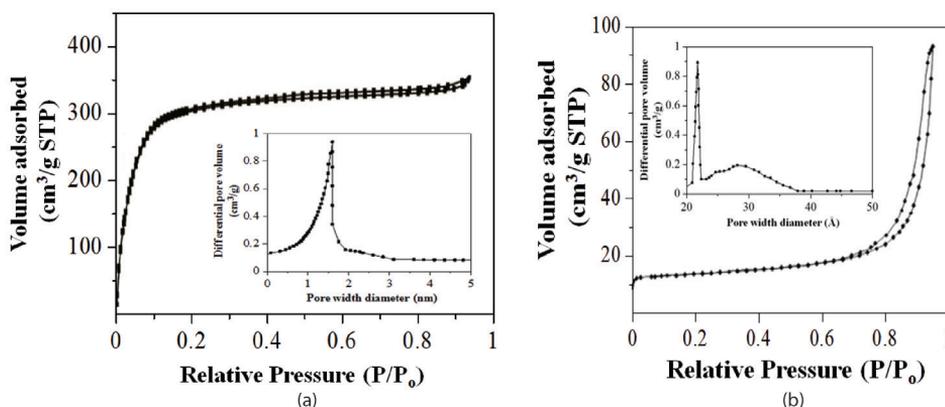
Figure 3: Physisorption measurements for (a) SiNS and (b) HNS. Inset represent Barrett, Joyner and Halenda method (BJH) models

Physisorption measurements

To quantify the surface area, the nitrogen physisorption measurements for SiNS and HNS are presented in Figure 3. According to the IUPAC classification, the isotherms in Figure 3(a) for SiNS are of a typical type I, which is significant for highly microporous materials. The primary adsorption occurred at the low relative pressure of $P/P0 < 0.1$, with the absence of a more rounded 'knee' indicating that the pore sizes were narrowed. As can be seen in Figure 3(b), HNS exhibits a typical type-IV isotherm with H3-type hysteresis loop at the high relative pressure of $P/P0 > 0.6$, which is significant for the mesopores networks, while the H3-type hysteresis loop is attributed to slit-shaped pores. Based on the measurements, the calculated Brunauer-Emmett-Teller (BET) surface area for SiNS and HNS has been experimentally determined to be 538.74 and 20.04 m2/g, respectively. For comparison, the SiNS has higher surface area as compared to other synthetic silica material (100 to 400 m2/g), while the HNS has 4 times higher surface area than their commercial hematite (5 m2/g) (Matmin, J., Affendi, I., Ibrahim, S., & Endud, S.; 2018). The results are consistent with other works in producing SiNS and HNS from biomaterials templates. As shown in the inset Figure 3, the average pore diameters for SiNS and HNS is determined based on the BJH model

to be 1.6 and 2.2 nm, respectively. To give comparison, the surface area measurements were summarized in Table 1.

Based on the morphology and physisorption measurements, it is suggested that the presence of RS acts as a template that effectively facilitates the formation of SiNS and HNS for nanostructured silica and hematite, respectively. The presence of RS not only gives pseudo-ordered morphology but also aided the formation of porosity in both SiNS and HNS.

Table 1: Physisorption measurements data for SiNS and HNS

Sample	Surface area (m^2/g)	Pore diameter (nm)
HNS	20.04	2.2
SiNS	538.74	1.6

4. CONCLUSIONS

In summary, the nanostructured hematite (HNS) and silica (SiNS) were successfully prepared using rice starch by an establish rice starch-templated synthesis. The SiNS metalloids showed a pseudo-spherical morphology with nano-sized from 13 to 22 nm, and surface area of 538.74 m^2/g. On the other hand, the HNS transition metals showed a spherical-shaped morphology with nano-sized from 24 to 48 nm, and surface area of 20.04 m^2/g. In the future, both synthesized SiNS and HNS could be used as a potential nano-catalysts owing to the ordered morphology and porous networks that might facilitate optimum charge transfers process.

ACKNOWLEDGEMENT

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Mild Preparation of Two-Dimensional Layered Tin Disulfide for Visible Photocatalyst

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A B S T R A C T

Two-dimensional (2D) layered materials are highly attractive because of their excellent electronic properties, sizable bandgaps and stable charge transfer applications. One of the prominent layered materials that is currently investigated is tin disulfide (SnS_2). Conventionally, SnS_2 are prepared via calcination of the precursor mixtures at elevated temperatures to give irregular morphology. Herein, 2D layered tin disulfide were successfully prepared by a direct-heating method using mild preparation. Different heating source of sunlight, light bulb and hot-plate was evaluated for comparison. All the SnS_2 exhibit a strong (001) facets indicating crystal growth along [001] orientation and similar IR spectra. Interestingly, only SnS_2 produce under direct-heating by hot-plate give inter-layered structures which are composed of interconnected sheet-like morphology. Moreover, the as-synthesized SnS_2 with 2D layered materials promise an excellent photocatalytic performance in visible-light region.

Keywords: Two-dimensional materials, layered morphology, tin disulfide, mild preparation, visible photocatalyst.

1. INTRODUCTION

Over the last decades, the most extensively highlighted photocatalysts is titanium dioxide (TiO_2) due to its reliable semiconductor properties. Nonetheless, its broad band gap energy at 3.2 eV makes it impossible to utilize TiO_2 under visible light and thus, limits the functionality in advance photocatalytic system. In recent years, layered materials of graphene-like or metal sheet structured with two-dimensional (2D) arrangements of multi-layer thickness possess intriguing properties as visible photocatalyst. Among these materials, tin disulfide (SnS_2) are increasingly important for its wide band gap at 2.18-2.44 eV and are known as n-type electrical conduction

under visible respond to wavelengths from about 390 to 700 nm. Moreover, layered SnS_2 by S-Sn-S stacked structural units give superior electronic properties, has been applied as photodetectors, semiconductor and supercapacitor.

Today, SnS_2 are conventionally prepared via calcination of the precursor mixtures of metal oxides or thiosulfates, thiourea, thioacetemide, and sulfur powders at elevated temperatures to give only irregular morphology. Typical synthetic methods include thermal evaporation, electrodeposition, spray pyrolysis technique, chemical bath deposition, sputtering, and many more. Unfortunately, all of these methods strongly depend on the presence of heating at above 200 °C. To the best of author's knowledge, there is no reports on the preparation of SnS_2 layered under mild conditions are found in literatures. Hence, it is difficult to obtain 2D layered SnS_2 via direct solid-state reaction using metals precursors under mild condition.

In order to solve this problem, a direct-heating method is proposed and developed to produce the 2D layered morphology of SnS_2. In this work, tin (IV) chloride pentahydrate, $SnCl_4.5H_2O$ and thioacetamide (TAA) were fabricated without calcining the as-obtained composite. For the first time, SnS_2 were synthesized by direct-heating methods which was proposed via series of heating source such as sunlight, bulb and hot-plate heating at 150 °C. The samples were systematically characterized for morphology and structure properties. In the next few years, the 2D layered morphology of SnS_2 can be developed as photocatalyst under visible light.

2. METHODOLOGY

Chemicals

All the reagents used were analytical grade, and were purchased and without any additional purification. Deionized water was used throughout the reaction and synthesis process. Tin (IV) chloride pentahydrate (98%, Sigma Aldrich, St. Louis, MO, USA), thioacetamide (TAA 99%, Acros, NJ, USA), isopropyl alcohol (Tedia, Fairfield, CT, USA), ethanol (99%, Fisher Chemicals, NH, USA), and hydrochloric acid (HCl, 36.5-38.0%, JT Baker, A.C.S. Reagen, USA).

Preparation of Tin Disulfide

In a typical preparation of SnS_2, 0.45 g $SnCl_4.5H_2O$ and 0.33 g TAA are dissolved in 30 mL isopropyl alcohol in a perfectly screw-capped test tube. Subsequently, the solution was transferred to a tube after 30 min of vigorous stirring. Then, the collected precipitates were centrifuged and rinsed with large amounts of de-ionized water and ethanol to give golden solids. The solid was later made acidic by adding 0.5 ml of concentrated HCl. To develop the direct heating-methods, samples in triplicates were introduced to different heat sources. For comparison, 5.0 g of samples were exposed to direct sunlight under continuous stirring for 6 h and denoted as SL-SnS_2. On the other hand, 5.0 g of samples that were placed in a specially design box and illuminated to light bulb (25 W) under continuous stirring for 6h and denoted as LB-SnS_2. Lastly, 5.0 g of samples were heated at 150 **°C** on hot-plate using glycerin as the medium under continuous stirring for 6 hours is labeled as HP-SnS_2. This temperature was introduced based on series of optimization process that is presented elsewhere.

3. RESULTS AND DISCUSSION

The crystallinity and phase composition of all SnS_2 were characterized by XRD and the result is shown in Figure 1. Based on Figure 1, all the XRD peak positions matched well with the standard diffraction data of JCPDS no. 23-0677, representing hexagonal type of SnS_2 (space group $P\bar{3}m1$) with cell parameters of a = b = 3.659 Å and c = 5.879 Å using Bravais lattice system in the following Equation.

$$\frac{1}{d_{hkl}^2} = \frac{4}{3}\left(\frac{h^2+hk+k^2}{a^2}\right) + \frac{l^2}{c^2}$$

Which c and d are the lattice parameters of hexagonal structure and d is the distance of the corresponding adjacent plane (hkl). The strong reflections and absence of impurity peaks demonstrated a high crystallinity and purity of the product. It can be seen in Figure 1, for all SnS_2 the strongest peak is at 2θ = 15.0° could be assigned to the (001) facet of hexagonal SnS_2. Also, peaks at 2θ , 28.2°, 32.1°, and 41.9° are corresponding to the diffraction peaks of (002), (003), and (004) facets having quite strong intensity. This indicates that the intense [001] orientation is the preference orientation (Park, S., Park, J., Selvaraj, R., & Kim, Y.; 2015). Furthermore, exposed (001) facets make layered sheets that lie on the substrate, forming [001]-oriented structures. Based on Scherrer equation, the strongest (001) peak showed that the crystal size of the layered sheet was measured around 70 nm. Especially, HP-SnS_2 demonstrates strongest reflection corresponding to the (001) planes, which is stronger than the (101) and (100) peaks that is considered due to the anisotropic layered shape, and high crystallinity, indicating a preferential layered-stacking.

To further confirm the formation of SnS_2, FTIR measurement was carried out and their corresponding spectra are shown in Figure 2. All of the as prepared SnS_2 exhibits almost similar spectra. Typically, as can be seen from the FTIR spectra (Figure 2), the SnS_2 shows the IR peaks at 1628 cm^{-1} significant for Sn-Cl deformation modes. Moreover, the IR peaks at 732 and 630 cm^{-1} can be attributed to the stretching mode of C=S. Notably, the IR peaks at 3380, 3279, and 3175 cm^{-1} can be assigned to the stretching modes of N-H. Nonetheless, broad peaks at around 3500 are clearly present, indicating strong water bounds of the intermolecular H-bonds in the SnS_2 2D-layered structures.
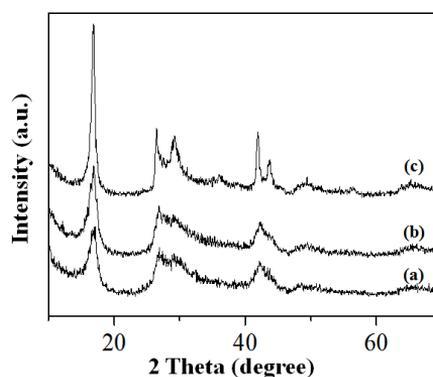
Figure 1: XRD pattern for (a) SL-SnS_2 (b) LB-SnS_2 and (c) HP-SnS_2
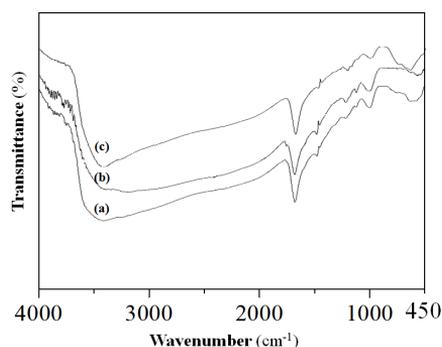
Figure 2: FTIR spectra for (a) SL-SnS_2 (b) LB-SnS_2 and (c) HP-SnS_2

FESEM analysis as shown in Figure 3 confirmed the novel aggregated morphology of the as prepared SnS_2 at different heat sources. It can be seen in Figure 3, the presents of large-scale 2D nanosheets with
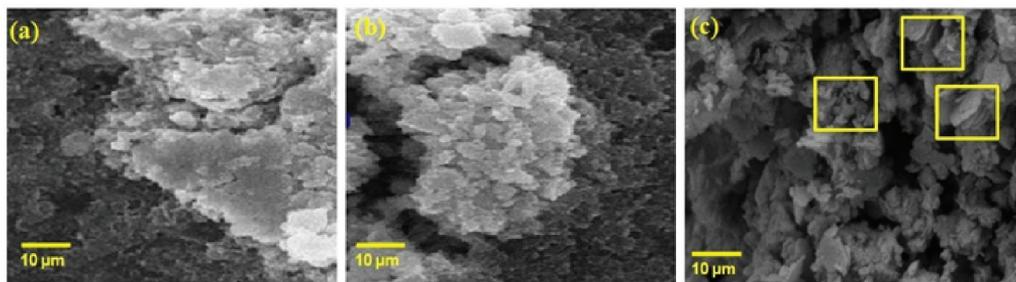
Figure 3: FESEM images for (a) SL-SnS$_2$ (b) LB-SnS$_2$ and (c) HP-SnS$_2$ with box representing the inter-layered structures.

random distribution and almost uniform dimension for all SnS$_2$. For both SL-and BL-SnS$_2$, FESEM images (Figure 3, panels a and b) showed similar heavily aggregated morphology. Interestingly, FESEM image in Figure 3(c) displayed inter-layered images of the HP-SnS$_2$ product, which are composed of interconnected sheet-like morphology as suggested by Mondal, C. et al, (2014). The particles size between the sheets of HP-SnS$_2$ was observed in a wide range of 300 to 900 nm and the thickness of the layered flakes was measured at 70 to 90 nm. Based on FESEM image, Figure 3(c) clearly exhibits smooth pseudo-hexagonal with surface regular sheet-like morphology. In particular, the HP-SnS$_2$ product derived from 6 h reaction time displays clear and regular boundaries of layered sheet particles without obvious coexisted by-product particles on the surfaces (Fu, W., Wang, J., Zhou, S., Li, R., & Peng, T., 2018). This result is in good agreement with XRD analysis, implying their well ordered single-crystalline characteristic.

It is worth mentioning, SnS$_2$ has narrower band gap energy (1.91-2.35 eV), non-toxic in nature, good thermal and chemical stability, as compared to most layered structures such as CdS, SnS and graphene, which makes it favorable in visible-light-responsive photocatalysts (Liu, H., Liu, Y., Wang, Z., & He, P., 2010). Furthermore, SnS$_2$ usually have good light absorption qualities in shorter wavelengths near the infrared (IR) and visible regions with stable conformity in acidic and neutral aqueous solutions (Yu, J., et al, 2014). In addition, with its unique 2D multilayered structure, SnS$_2$ could exhibit superior photocatalytic performance under visible light due to its generous charge migration orientation.

4. CONCLUSION

Series of SnS$_2$ were successfully developed under mild condition by direct-heating method on different heating source of sunlight (SL), light bulb (LB) and hot-plate (HP). This mild preparation is considered more gentle that does not follow the conventional methods by post-heating above 200 °C and followed by calcinations at above 700 °C. Notably, strong (001) facets indicating crystal growth along [001] orientation and similar IR spectra are measured for all of the SnS$_2$. The HP-SnS$_2$ showed an inter-layered structures which are composed of interconnected sheet-like morphology as observed by FESEM and supported by XRD analysis, which is very unique as compared to highly agglomerated morphology for both SL-and LB-SnS$_2$. In the near future, SnS$_2$ with 2D layered materials can be developed as photocatalyst, water purifier, and photodetectors in visible-light region, for its rapid electron transport that benefit fromhomogeneous 2D layered morphology.

ACKNOWLEDGEMENT

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Enzymatic-Catalyzed Production of Palm Oil Wax Esters in a Solvent-Free System

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A B S T R A C T

Wax esters are known to serve as good carriers in pharmaceutical and cosmeceutical formulations due to its simpler molecular structure. More importantly, wax esters have been shown to impart excellent wetting behavior at the interface while the non-irritating properties on human skin make it desirable especially in cosmetic industry. To date, wax esters are conventionally produced via chemical catalyzed reaction or using organic solvent as reaction medium, which associated with several environmental issues. Alternatively, enzymatic catalyzed reaction in a solvent-free system offers a 'greener' process, as it does not requires volatile organic solvent and ensures the specificity and selectivity of the catalyst towards the formation of desired products. Therefore, this still undergoing study is performed in order to optimize the production of wax esters from palm oil using immobilized enzyme in a solvent-free system. The optimization process will be conducted using statistical based technique of Response Surface Methodology (RSM) where four parameters namely, temperature, substrate molar ratio, enzyme amount and impeller speed are selected. The outcome of the study could be used to develop further knowledge on the scale up of wax esters production in the future.

Keywords: Wax esters, enzyme, palm oil, optimization.

1. INTRODUCTION

Wax esters are long chain esters that are derived from fatty acids and alcohols with both chain lengths of 12 carbons or more as shown in Figure 1. In the industries, wax esters have wide range of application such as lubricants, polishes, plasticizers, coating materials and as raw materials in cosmetics. Due to their special characteristics of non-

toxic, good fat soluble properties, non-greasy and excellent wetting behavior at interface, they are very desirable to be applied in cosmetic, pharmaceutical and coating applications (Basri, Kassim, Mohamad, & Ariff, 2013). However, relying on the natural supply of wax esters such as jojoba oil, sperm whale and beeswax will not be able to accommodate the global demand on the wax esters due to theirs scarce supply

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and at present too expensive for commercial exploitation (Deng et al., 2011). Therefore, the need to find substitute to the natural wax esters have grown. On the other hand, the palm oil industry, which is Malaysia's highest-yielding commodity for oils and fats has focused on identifying sustainable production measures and processes to add value to thepalm oil. Palm-based specialty oleochemicals, particularly palm-based wax esters are one of the palm oil product derivatives that can be produced through reaction between palm oil andfatty alcohols using chemicals and enzymatic catalyzed methods which were mostly performed in the presence of organic solvents. However, chemical catalyzed synthesis and the use of solvent often lead to environmental issues such as the used of hazardous chemicals and release of volatile organic compounds (VOC's) to the environment (Jumbri et al., 2015). Therefore, performing the reactions using enzyme catalyst under solvent free conditions can help to overcome the drawbacks. Furthermore, enzyme catalyzed method shows high selectivity and specificity towards desired products thus increase the yield of product formed(Ghaffari-Moghaddam, Eslahi, Aydin, & Saloglu, 2015). In this work, Lipozyme TL IM was used as biocatalyst for the optimization of palm-based wax esters production in solvent-free system. The optimization process was conducted using statistical based technique of Response Surface Methodology (RSM) where four parameters namely, temperature, substrate molar ratio, enzyme amount and impeller speed were selected. RSM is a useful model to predict the highest yield of wax esters produced and study the effects of various experimental conditions on the yield simultaneously with reduced numbers of experimental runs consequently reducing the time and the cost of the production process(Ba & Boyaci, 2007).
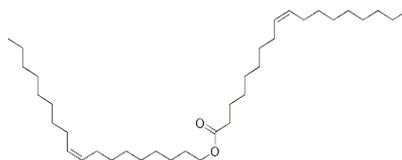
Figure 1: Chemical structure of wax esters

2. METHODOLOGY

Enzymatic synthesis of palm oil wax esters in solvent-free system.

In this undergoing work, optimum conditions of enzymatic synthesis of palm oil wax esters in solvent-free system was investigated. Reaction parameters such as temperature, amount of enzyme, substrate molar ratio and impeller speed were evaluated. Enzymatic alcoholysis reaction was conducted in 2L Stirred Tank Reactor (STR) equipped with Rushton turbine impeller and water bath for temperature controller. Different molar ratios of palm oil and oleyl alcohols are placed in the STR. Various amounts of Lipozyme*TL* IM were added subsequently and the reaction mixture was continuously reacted for 3 h. No solvent was added into the reaction mixture. Parameter set including temperature, impeller speed, substrate molar ratio and amount of enzyme were varied accordingly based on the data generated by RSM. At the end of the reaction, 20 mL of sample was withdrawn for gas chromatography analysis

3. RESULTS AND DISCUSSION

The experiments and data collection for this work are still in progress.

4. CONCLUSION

In parallel with the concept of 'green chemistry', research trend has been directed mainly towards green process

that is environmentally benign and sustainable. Enzymes are biocatalysts that have exquisite properties like highactivity, selectivity and specificity that permit the chemical processes to be performed under nonhazardous conditions. The yield of palm oil wax esters produced via enzymatic catalyzed reaction in solvent-free system are expected to be comparable or superior than reaction conducted in solvent system without at the expense of environment and safety.

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Return Loss Simulation of Coconut Ashes in Microwave Absorber Brick

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A B S T R A C T

Flat microwave absorber is commercially used for places such as hospital and military to prevent the interferences of other microwave signals from intercepting the desired signal and disturbing the functioning electronic devices. The flat microwave absorber is placed onto the cement wall of the building to prevent the microwave signals from outside to penetrate. Commonly, the commercial flat absorber is produced by synthetic chemical substances that could lead to hazardous pollutions. In this report, biomass material is used to replace the chemical substances and the requirement to attach the flat absorber onto the cement wall is eliminated by creating a cement brick that is not only used for building but can also absorb the microwave propagations (dual-function). Due to the abundance of organic wastes of coconut in Malaysia, coconut husk is chosen as the biomass material. The abilities of the coconut husk to reduce and attenuate the incident microwave signals are enhanced by turning it into ash through pyrolysis process. With the precise ratio of cement mixture for sturdy brick and five different compositions of coconut ashes, a microwave absorber brick is designed and produced to achieve the goal. Different amount of coconut ashes in the cement brick gives different measured value of permittivity. The permittivity value is used in the design of coconut ashes microwave absorber brick as the property in the simulation process. The simulation is performed by the Computer Simulation Technology (CST) software to obtain the return loss (absorption) graphs for those five different bricks for frequencies range between 8 to 12 GHz. This report proves that the specific amount of coconut ashes for correct ratio of cement mixture offers optimum ability to absorp the propagations of unwanted microwaves.

Keywords: Cement brick, microwave absorber, CST, biomass, coconut.

1. INTRODUCTION

The need of microwave absorber for elec-tronic devices shield is crucial due to the complexities of high frequencies telecom-munication systems development. The

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commercial microwave absorber is commonly made of synthetic matters such as polyurethane and polystyrene which are hazardous to nature. They are perilous to environment as they emit toxic fumes and contain non-renewable elements that are hardly decomposed. It is the best thing to do if those hazardous synthetic materials are replaced with the biomass material that is well-known as the organic or agriculture waste from nature substantial. Besides, the biomass material has the prospective in absorbing the reflection of microwave signals, as studied by Nurbazilah et al. (2015) on the coconut wastes.

Coconut husk is one of the biomass materials that are easy to get since Malaysia is one of the countries that possesses the progressive coconut industry. Hence, coconut husk for production of sturdy brick as, microwave absorber in a shape of a brick is the goal of this project. Thus, the content of carbon element in the coconut husk must be added significantly in order to induce the ability of the material in absorbing the microwave signals. Carbon is a conductive filler that is good for microwave signals absorption as it has effective electromagnetic interference shielding properties that lead to maximum attenuation of signals and at once, eliminate the signal disturbance propagations (Radakisnin et al. 2017). The coconut husk can be turned into ashes by pyrolysis process where all the volatile substances are removed and dried powder is yielded. Carbon is the common element used for absorbing and eliminating the propagation of microwaves (Alexandre et al., 2017).

Commonly, flat microwave absorber is in a shape of square with smaller thickness. It is commercially used for buildings or rooms such as Intensive Care Unit (ICU), military, and cinema. The commercial flat microwave absorber is installed onto cement walls after the building is completely built. This paper suggests a cement brick production for building and at the same time, has the potential to absorb the unwanted microwave propagations from interfering the electronic devices inside the building. The study is done on simulation through CST software where the return loss is examined for different compositions of coconut ashes in cement brick mixture.

Different content of carbon offers different value of permittivity that affects the performance of absorption. The study conducted by Alexandre et al. in 2017 showed that the higher content of carbon in a material leads to the lower penetration of microwaves into the material due to shielding effectiveness. However, the shielding effect varies non-uniformly with different amount of carbon as the porosity and size of the element are taken into account (do Amaral Junior et al., 2017). Thus, the absorption potential with different percentages of carbon element from coconut ashes is simulated for the designed brick in order to obtain the correct composition required for optimum result of absorbability.

2. METHODOLOGY

Microwave absorber brick design & simulation

Coconut ashes microwave absorber brick is designed using the approximate measurement as the commercial brick's dimensions which are 20 cm long, 10 cm for width and 6 cm for thickness as shown in Figure 1. The design is done in CST software with property of permittivity, ε, is changed accordingly based on the measured value. The value of permittivity of the coconut ashes varied for different amount of the coconut ashes (in

percentage) in cement brick mixture. Table 1 shows the value of measured permittivity for different amount of coconut ashes. The permittivity value is measured using the dielectric measuring device.
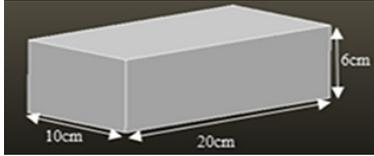
Figure 1: Designed microwave absorber brick in CST software

Table 1: Permittivity value for different amount of coconut ashes in percentage

Percentage of Coconut Ashes	Permittivity
10 %	4.1
20 %	4.2
30 %	5.3
40%	5.7
50 %	6.4

Through the process of pyrolysis, the amount of carbon element is increase since the water and other volatiles compounds are eliminated from the coconut husk, and the husk are then turned to charcoal in powder form (Abdullah et al., 2012). The yield of the pyrolysis process of the coconut husk is used in the mixture of producing a cement brick with correct ratio of foam agent, water and cement.

With different values of permittivity, the designed microwave absorber brick is simulated at range of frequency from 8 to 12 GHz. This range of frequency is chosen because this is the range of signals used by the common electronic communication devices such as mobile phone, internet, and so on as it is defined by ITU. The return loss graph is obtained to be analysed with the optimum result of absorption.

3. RESULTS AND DISCUSSION

Figure 2 shows the simulation result of return loss for five (5) different percentages of coconut ashes in designed microwave absorber brick. The lower the V-shape graph gives the better value of absorption. It is because the minimum value of absorption is -10 dB. Anything that goes above the value reflects the poor absorption.

In addition, Figure 2 shows the optimum result of absorption capability of the designed coconut ashes microwave absorber brick which is obtained from 10% of coconut ashes. This is because the graph shows all return loss values within the specific frequencies of 8 to 12 GHz are lower than -10 dB.
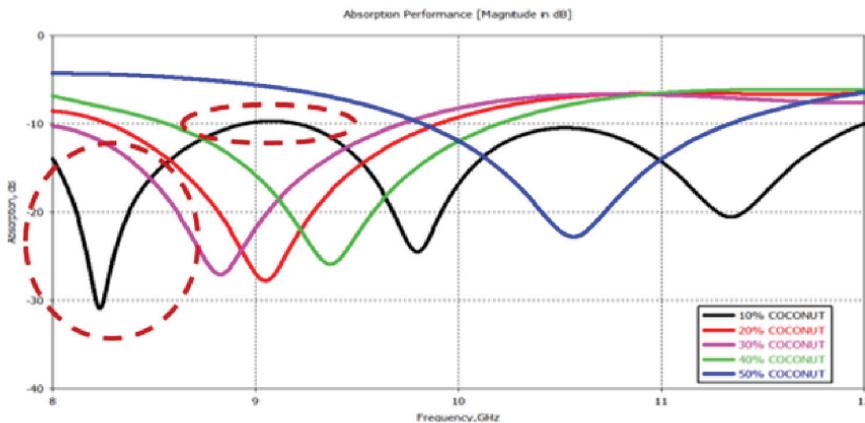
Figure 2: Simulation result in return loss graphs

However, the other four (4) graphs shows the minimum return loss (absorption) appeared to be above the threshold (-10 dB).

On the other hand, the obtained return loss graphs proved that the coconut ashes are capable of absorbing the microwave signals but at specific frequencies since the values of return loss are below the -20 dB. However, the specific amount of coconut ashes must be well considered since the ability to absorb the signals can be affected by porosity and size of the carbon element in the mixtures of cement which could also play a significant role in affecting the carbon's absorbability. The result shows similar findings by the previous study done by Nadrah et al. in 2017 whereby the specific amount of biomass material gives different value of absorption.

4. CONCLUSION

The coconut ashes contain carbon element that is good for microwave absorption. However, in the formation of a sturdy brick, specific amount of coconut ashes must be considered. This is because; the amount of the materials used could determine the performance of microwave signal absorption. The study shows that, 10 % of coconut ashes are enough to produce a microwave absorber brick with absorption frequency between 8 to 12 GHz. It also shows that lower permittivity produces better absorbability as evident in the coconut ashes microwave absorber brick.

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Automating Goods to Pallet Assignment Process Using Bin Packing Algorithm: A Prototype System

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A B S T R A C T

This study was conducted in a warehouse with the objective of automating goods to pallet assignment for order picking process using bin packing algorithm. The processes involved in this study include data collection and processing, prototype development and testing, and performance assessment. The performance of the prototype was assessed based on the number of pallets assigned by the prototype compared to the manual assignment, where the prototype outperformed the manual assignment in all cases tested.

Keywords: Bin packing, order picking, warehouse.

1. INTRODUCTION

Warehouses play an important role in a supply chain management as they provide temporary storage for finished goods from the production line before being shipped to customers. One of the processes taking place in a warehouse is order picking, which is the process of retrieving products from the temporary storage in order to fulfill customer orders. Based on studies conducted, order picking is the most labour intensive operation in a warehouse with manual systems, and it was estimated that the costs is as much as 55% of the overall warehouse operating expenses(de Koster, Le-Duc, & Roodbergen, 2007). Hence, there were many studies conducted aiming at reducing order picking time and cost such as studying the warehouse layout design, storage assignment methods, and picker routing methods.

In this paper, we are presenting a prototype system based on a case study from a local warehouse located in Petaling Jaya, Selangor, which focuses on goods to pallet assignment that is the initial part of order picking process. Currently, before the picker retrieve items from the storage area, a staff would process the customer orders by roughly estimating the total weight of the products and assigning them to pallets. This process is time consuming since it is being done manually and yields high number of pallet usage. High number of pallet usage would translate to increase delivery transportation cost because they

will require more trucks to transport them. The capacity of each truck is about 15 tons and it has space to carry the maximum of 24 pallets only. On the other hand, the sooner the goods are assigned to the pallet, the sooner the picker could retrieve the goods from the storage area and the sooner the goods could be shipped to customers or distribution centres, which would shorten the overall order picking process.

The objective of this study is to automate the goods to pallets assignment using bin packing algorithm. In bin packing algorithm, the goal is to use minimum number of bins as much as possible. Suppose we are given a finite list of items $L = W_1, W_2,…,W_n$, where each item weighs in the range of *(0, 1]*. These items are to be packed into bins $B_1, B_2,$ … with capacity of *1*, in such a way that the number of bins used is minimized(Boyar et al., 2016){Boyar, 2016 #10}. We can view goods to pallet assignment as bin packing problem, where goods are the items to be packed and pallets as the bins. In this study, the online category of bin packing i.e. next fit, first fit, and best fit were used as they are among the most studied algorithms. With online algorithm, the item is processed upon its arrival without prior knowledge of its weight or volumewhereas when first fit decreasing was used to represent the offline category, the items were sorted beforehand according to its weight before being packed.

Bin packing algorithm is being applied in many areas such as creating file backups in removable media, scheduling and allocating resources in data centres, loading goods to trucks, and many more. There are many variants of this algorithm such as next fit decreasing, first fit decreasing, best fit decreasing, worst fit, almost worst fit, harmonic-based, etc(Epstein, Favrholdt, & Kohrt, 2012; Grange, Kacem, & Martin,

2018).

2. METHODOLOGY

There were three phases involved in this study, as illustrated in Figure 1. In Phase 1, sample data which were basically the customer orders, was collected. The data then was formatted into a readable format by the computer program, as shown in Figure 2.

In Phase 2 the prototype was designed and developed using Java programming language, and tested to ensure it was free from programming errors.The Integrated Development Environment platform used is called BlueJ with GUI Extension, running on Windows 7. Figure 3 shows the sample screen of the prototype, which consists of input file, output file, and pallet capacity to be entered by the user. There were four bin packing algorithms coded into the prototype, namely next fit, first fit, best fit and first fit decreasing. The user may use any of the algorithm to assign the goods to pallets.

İn Phase 3, the performance of the prototype was assessed by comparing the number of pallets assigned by the prototype with the manual assignment. There were three sample customer order datasets used for this purpose.

3. RESULTS AND DISCUSSION

Figure 4 shows the sample output file produced by the prototype, where products were assigned to pallets for a particular customer order.

Figure 1: Methodology

Figure 2: Input file

Figure 3: Prototype screen

Figure 4: Output file

PRODUCT	SAMPLE ORDER1		SAMPLE ORDER2		SAMPLE ORDER3	
METHOD	Automated	Manual	Automated	Manual	Automated	Manual
Next-Fit	18 pallets		10 pallets		35 pallets	
First-Fit	15 pallets		9 pallets		29 pallets	
Best-Fit	15 pallets	31 pallets	9 pallets	20 pallets	29 pallets	41 pallets
First-Fit Decreasing	15 pallets		9 pallets		29 pallets	

Figure 5: Assignment results

As shown in Figure 5, all four bin packing algorithms significantly outperformed the manual assignment of pallets in all three dataset samples used. For Sample Order 1, 31 pallets were used when assigned manually, while 18 pallets were used by next fit and 15 pallets by using first fit, best fit and first fit decreasing algorithms. In all the three tests conducted, the first fit, best fit and first fit decreasing algorithms did better than next fit.

4. CONCLUSION

We have presented a prototype for automating assignment of goods to pallets for order picking process using bin packing algorithms. Based on the comparison of the number of pallets used, it seems that by using the prototype there is a potential to reduce the transportation cost of delivering the goods. However, for this prototype only the weights of the goods was considered. This prototype can be further improved by incorporating the dimension or size of the goods to be assigned.

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Captology Assistive Learning Application for Children with Learning Anxiety in Mathematics

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A B S T R A C T

Learning mathematics has been proven by numerous researches to be very challenging and rigorous for some children. Mathematical content which requires numerous cognitive abilities has made some children distance themselves emotionally and attudinally from mathematics.Various assistive technology are explored to help kids embrace the learning of mathematics. This research focused on developing a captology application for learning mathematic using ADDIE model. The scope of the study was limited to lower primary school children aged between 7 and 9 years old which is an important period for learning and mastering mathematical skills. Findings revealed that this application was successful in changing the students' attitude towards mathematics as proven by the scores of the post test results.

Keywords: Learning, mathematic,captology, ADDIE.

1. INTRODUCTION

Studying mathematics involves the combination of numerous cognitive abilities and demandsmeticulousness andprecision. It also requires effective storage, access, retrieval and a flexible working memory forinformation based on a variety of learning styles and preferences. Previous studies have documented that many students demonstrated negative attitudes and emotions to mathematicsand that these negative experiences of mathematics were associated with anxiety, shame, inadequacy andhopelessness (Ersoy and Akbulut, 2014). The objective of this research is to design and develop a captology learning application based on BJ Fogg's Theory for lower primary-grade school children between and including the ages of seven to nine. Captology is the study of computing related products as persuasivetechnologies which includes the design, research, and analysis of interactive computational technologies createdfor the purpose of motivating, influencing and persuading peoples to change their attitude or behaviours (BJFoggs, 2009).

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The prototype was developed to help motivate children with mathematic anxiety to ease their learning process, change their perceptionsand attitudes towards mathematicsand improve their mathematics test score. This study followed asystematic instructional design approach methodology called ADDIE model which stands for **A**nalyze, **D**esign, **D**evelop, **I**mplement, and **E**valuate (Baharuddin, 2018). It is widely used world wide by educators and instructional designers in designing and developing educational applications.

2. METHODOLOGY

ADDIE model consists of five phases that are analyze, design, development, implement and evaluation (Figure 1).
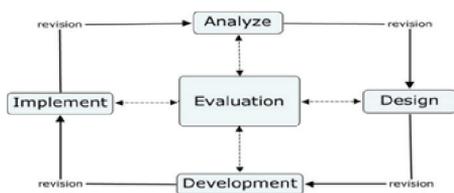
Figure 1: ADDIE Model

The analysis phase aimed to gather and analyze the desired information. Interview, questionnaire and observation were conducted among students to collect data about their motivation and learning preferences (Friedman, 2013). Fifteen students were selected as participants. The analysis phase indicated that the elements of cartoons and games are to be embedded in the application as the motivation factors for the children to use the mathematic application (Witzel and Mercer, 2003). Intrinsic motivational preferences such as mastery, love, sense of belonging and meaning along with extrinsic motivational styles such as badges, points and rewards are to be added in the application design.

The design phase saw all the addressed outcomes built into a blueprint for the implementation phase. Adobe Flash CS6 software was used to create the functional and interface of the application. Finally, functional testing was done and errors were recorded and corrected. The completed applications were then tested on the children and all their responses were recorded for future references.

3. RESULTS AND DISCUSSION

The students were required to sit for the pre and post mathematic tests. Pre-test was paper based mathematics test conducted before they used the application and post-test was conducted after the applications were used. Results showed that there was an improvement in their post-test scores. Based on the survey, it was also found that ninety percent of the students agreed that the interface attractiveness and persuasive elements embedded in the applications were very good.

CONCLUSION

It is concluded that the ADDIE Model has successfully persuaded and motivated students to learn and improve in learning mathematics. Students also gained a better learning experience with the embedded attractive user interface design and persuasive elements.

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Fast Absorbing Antioxidant Creams Based on Fractionated Virgin Coconut Oil

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ABSTRACT

In recent years, antioxidant creams were investigated from long aliphatic chains that suffer from slow absorbing rate and unlikely greasy texture. To overcome the limitations, we developed a type of non-greasy antioxidant cream, enriched with antioxidant of tocotrienols that neutralises free radicals scavenges on fast-absorbing to the skin, whichwas formulated based on fractionated virgin coconut oil (FVCO). In this study, several profiles of FVCO were successfully produced using solvent fractionation technique to separate solid-stearin and liquid-olein fractions at 25°C to 2°C. Based on gas chromatography equipped with mass spectrometry techniques, different amounts of medium chain fatty acids(MCFAs) of oils wereanalysed. The order of alkyl chains is as follows; 2°C liquid (72.93%) > 5°C liquid (69.61%) > VCO (61.2%) > 5°C solid (59.00%) > 2°C solid (51.97%). Moreover, tocotrienols skin permeation study was developed by using tape stripping technique and demonstrated the following order of permeability in the stratum corneum (SC) to epidermis-dermis layer; 2°C liquid (70.37%) > 5°C liquid (58.48%) > VCO (43.66%) 5°C solid (41.63%) > 2°C solid (25.79%). The high MCFAs in the liquid-olein fraction of virgin coconut oils are a promising formulation for fast permeability for drug delivery, especially in the skin permeation system.

Keywords: Medium aliphatic chain fatty acid, fractionated virgin coconut oil, tocotrienols, stratum corneum, skin permeation.

1. INTRODUCTION

In general, there are two types of cream oil; oil in water (o/w) and water in oil (w/o) based system. Dispersed system comprising of an outer continuous phase and an inner immiscible dispersed phase is known as oil in water (o/w) emulsions. Meanwhile, when the phases are inverted, the system is known as water in oil (w/o) emulsion. Over the past decades, w/o emulsion to produce creams has beenvastlyinvestigated from long aliphatic chains. However, these systems suffer from slow absorbing rate and unlikely greasy texture. To develop cream from o/w emulsion,a perfect balance between the alkyl

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chain and the thermodynamic surrounding is still poorly investigated. To overcome the limitation, a non-greasy antioxidant cream was developed from medium chain fatty acids (MCFA).

Typically, MCFA holding 8-12 carbons are saturated hydrocarbonsthat can easily be found in virgin coconut oil (VCO) compared to long-chain fatty acids (LCFA), which contain 14 or more carbon atoms and can own one or more double bonds. VCO, as the primary source of MCFAs, is a product from copra, which is the dried kernel or meat of coconut that undergoes a centrifuging process to separate it from the emulsion. It is colourless to pale brownish yellow oil containing high level of low molecular weight saturated fatty acids (Marina, Che Man, & Amin, 2009). VCO contains low level of unsaturation fatty acids (i.e., below 7%) and therefore,it is highly stable from oxidation reaction (Guarte et al., 1996). Multi-stage extraction process canincrease the yield of MCFA in the oil. This can be done through fractionation of the oil by using the centrifuge mechanical technique at 12000 rpm (387072.2 g). Two phases of oil and water can be easily and respectively distinguished and separated.

In this study, the effectsofthe compatibility of the drug and excipient under real-time (25°C) and accelerated conditions (40°C) were examined. A liquidfraction of VCO, with fast-absorbing characteristic and non-greasy formulation that allows it to permeate deeper into the skin compared to natural VCO and other oils,was also analysed for its commercial potential and stability.

2. METHODOLOGY

Two types of oil in water (o/w) cream were formulated using natural VCO and fractionated VCO as the excipient. The oil phase was prepared by melting Olivem-1000, together with VCO, at 60°C. With the aid of gentle heat, 5% of tocotrienol was dissolved into the water phase consisting of cetostearyl alcohol. The mixture was stirred until completely homogenous and cold. For each formulation, both physical observation and appearance were evaluated to select the best formulation.

Meanwhile, determination of fatty acids composition was carried out using Gas Chromatography, GC fitted with mass spectrometer detector (Agilent Technologies 6890N, Santa Clara, CA). The column used was a polar capillary column, Zebron ZB-FFAP with 0.25 mm internal diameter, 30 meter length and 0,25 um film thick (Phenomenex, Bellefonte, PA, USA) at a split ratio of 1:25 and at a column pressure of 15 psi. The initial column temperature was 50°C (hold for 2 min), followed by increasing it to 180°C at the rate of 5°C/min/hold for 2 minutes at 180°C, and later to 8°C/min (hold for 5 min at 200°C).

The permeation of tocotrienols into the skin was determined using tape-stripping technique.Normal skin samples from animal module were left unstripped (control mem- branes), or to groups to be subjected to tape stripping 5, 10, 15 or 20 times, in order to remove different proportions of the stratum corneum. The tape stripping method wasdone following the standard approach described in the OECD 428 test guidelines using 22 mm diameter Cuderm D-Squame stripping discs (CuDerm Corporation, Dallas, USA), which were applied to the dry skin surface at a constant pressure for five seconds. Triplicates were carried out for the specified number of tape strips of the stratum corneum at initial and after 24 h following the tape stripping procedure.

Initial and 24 h measurements were also taken for the unstripped control membranes. Static diffusion cells, with the receptor compartment of a fixed volume and kept at a controlled temperature (water bath, usually at 37°C to maintain skin surface temperature of 32°C as an *in-vivo* mimic),were used as the experimental design. The sample solutionand extracted skin module membrane were analysedusing the high-performance liquid chromatography (HPLC) (Bartosova & Bajgar, 2012).

3. RESULTS AND DISCUSSION

From the gas chromatography, lauric acid (C12:0) was found to be the most dominant fatty acid at the range of 40.23 to 50.45%. The values of lauric acid obtained in the liquid fraction shown to belower than VCO, and in comparison to both liquid fractions. The value further decreased in 2°C solid, which was from 45.31 to 40.23%. A significant difference was found in the content of lauric acid in the original VCO and the rest of fractions due to the difference in the extraction process. The caproic fatty acids (C6:0) in this study ranged from 1.52 to 3.54%, and not detectable in both solid fractions. The 2°C liquidsample contained the highest amount of caprylic acid (C8:0), while the 5°C liquidsample showed the highest percentage of capric acid (C10:0). In this study, medium chain fatty acids ranged from 60.5 to 63.6%. The myristic (C14:0) and stearic (C16:0) acid contents in this study were comparable to the finding reported by Laureles et al. (2002). The linoleic fatty acid (C18:2) was found to be higher in the VCO samples than in the study by Dia, Garcia, Mabesa, and Mendoza (2005), but lower than the finding reported by Laureles et al.(2002).

Means within each row with different superscript are significantly different at $P < 0.05$. The relative standard deviation was less than 5% for all the samples. Fatty acid compounds C6 methyl hexanoate, C8 methyl octonoate, C10 methyl decanoate, C12 methyl laurate, C14 methyl myristate, C16 methyl palmitate, C18:0 methyl stearate, C18:1 methyl oleate, C18:2 methyl linoleate.

Data presented in Table 2 indicated that all model drugs were released from the formulations, penetrating the membrane into the receptor compartment of the Franz's cells. The permeation profiles varied widely between the solid, liquid fractionated and original VCO as the control. A notable amount of tocotrienolswas also detected in the epidermis-dermis layer compared to the solid fraction, while the accumulative amounts of model drugs increased from 58.48% to 70.37% as 2°C liquid-oleinVCO was usedin the cream formulation. Besides that, model drug tends to retain in startumcorneum layer and the results showed 58.37% and up to 74.21% assay content for the solidify-stearin VCO fraction used in the formulation.

According to Ibrahim and Li, liquid fatty acids have a relatively higher topical permeation efficiency compared to solid fatty acids due to low lipophilicity and low melting points (Ibrahim & Li, 2010). As a result, solid fatty acids are not as effective as the liquid fatty acids as the permeation enhancers in topically applied formulations. The results of this study have shown that an increase of medium chain fatty acid would definitely increase the permeation as well because 2°C liquid VCO cream has high permeability result.

Table 1: VCO and fractionated VCO Fatty acid compositions

Fatty Acid	Composition (g/100g)				
	VCO	5°C solid	5°C liquid	2°C solid	2°C liquid
C6	1.52[a]	n.d	1.44[b]	n.d	3.54[c]
C8	9.36[a]	7.55[b]	9.84[c]	6.18[d]	11.25[e]
C10	7.08[a]	6.14[b]	7.8[c]	5.56[c]	7.69[d]
C12	47.15[a]	45.31[b]	48.85[c]	40.23[d]	50.45[e]
C14	14.12[a]	16.74[b]	13.23[c]	17.34[d]	12.41[e]
C16	10.45[a]	11.17[b]	9.12[c]	13.21[d]	8.71[e]
C18:0	3.31[a]	4.02[b]	2.51[c]	4.71[d]	1.87[e]
C18:1	5.28[a]	6.74[b]	4.51[c]	7.54[d]	3.57[e]
C18:2	1.73[a]	2.33[b]	1.02[c]	5.23[d]	0.51[e]

Table 2: Total amount of penetrated/permeated model drug for the *in-vitro* study

Sample	Stratum corneum (tape stripping result) (%)	Epidermis-dermis (%)
VCO	56.35	43.66
5°C liquid VCO	41.52	58.48
5°C solid VCO	58.37	41.63
2°C liquid VCO	29.64	70.37
2°C solid VCO	74.21	25.79

4. CONCLUSION

The production of enhanced liquid-olein fractions obtained from VCO fractions showed prominent skin permeation potential characteristics, in comparison to comparable controls and have been correlated with their physiochemical properties of MCFAs properties. Our reported data suggeststhat MCFAs consistently react to a greater degree than LCFA when formulated with prospective lipophilic drug types,and therefore can be potentially used for commercial and industrial purposes.

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Nanospheres Hematite from Starch-Template for Photo-Degradation of Methylene Blue

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A B S T R A C T

Nanosized hematite (NH) are conventionally prepared with the presence of copolymer surfactants to give agglomerated, disordered and irregularly-shaped hematite morphologies such as bitruncated polygons and pseudo-peanut shapes. So far, in preparing NH, having monodisperse, free-agglomerations, and regular-shaped hematites remains illusive. This study presents a facile synthesis of NH, without the presence of copolymer surfactants, by simply utilizing rice starch-assisted synthesis. The NH showed well-crystallized nano structure materials having spherical-shaped morphology from 24 to 48 nm. Moreover, the NH exhibited enhanced photocatalytic degradation of methylene blue dye, owing to the large surface-to-volume ratio. The current work has provided a facile synthesis route to produce spherical nanostructured hematite without the use of hazadous copolymer surfactants, in agreement with the principles of green chemistry for the degradation of dye contaminant.

Keywords: Templating method, spherical structures, nanosized hematite, nanostructured materials.

1. INTRODUCTION

In recent years, a variety of synthetic methods have been investigated to produce nanosized hematites (NHs) using different approaches (Ali et.al, 2016; Saif, Tahir & Chen 2016; Lu, Salabas & Schuth, 2007) that had only been successful to produce disordered hematite morphologies (Lu, Salabas & Schuth, 2007; Ozaki et.al., 1986; Das, Mondal & Mukherjee, 2014). Therefore, tremendous efforts are focused on controlling the morphology of NHs by using typical additives such as copolymer surfactants, surface active structures, stabilizing agents and co-precipitating salts (Patra et.al.,2016; Trpkov, Panjan & Tadic, 2018; Zhu et.al., 2012;).However, the presence of additives significantly affects the percentage yield and materials morphology, as well as NH's purity due to the presence of by products and salts' impurities (Doermbach & Pich, 2015; Aslam et.al., 2007; Hao et.al., 2016; Gnanaprakash et.al., 2007). Today, copolymer-free syntheses of NHs are proposed to overcome such problems, using biomaterials templates of starch. The use of starch as a template

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has been reported in a number of previous studies (Hao et.al.,2014).Notably, starch consists of linear amylose and branched amylopectin structures, is rich in hydroxyl (OH) backbones, and contains abundant alcohol terminals or hydroxyl group, that is useful in assisting formation of NHs, as shown in Figure 1.

In this communication, here, we report starch-assisted method for the fabrication of NHs inspired by our previous work on the green synthesis of nanomaterials using rice starch (Matmin, Affendi & Endud, 2018). Owing to the spherical shape that demonstrates a larger surface area, the NHs synthesized from this method were successfully used as a photo-catalyst for degradation of methylene blue (MB), a harmful effluent to living organisms and are a major source of water contamination specifically from industrial textile's waste. Furthermore, the presence of MB has led to vomiting, nausea, and permanent damage to eyes on acute exposure to humans (Lo, Darracq & Clark, 2014). Therefore, the treatment of water effluents containing MB is one of the dire concerns in the field of environmental chemistry.
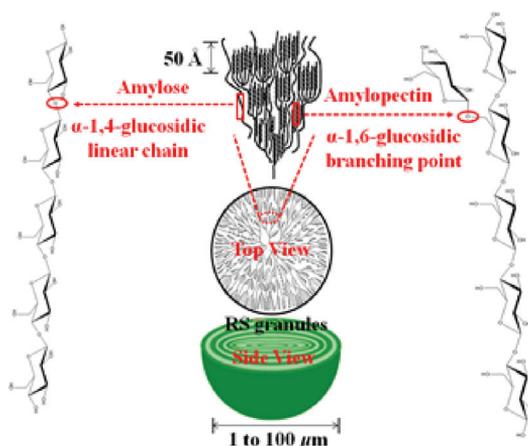
Figure 1: Starch granules model representing linear amylose and branched amylopectin chains

2. METHODOLOGY

All the starting materials were analytically graded and directly used without further purification.

Preparation of nanosized hematites (NHs)

The NHs were synthesized according to an established work presented elsewhere (Matmin, Affendi, Ibrahim, & Endud, 2018). Firstly, an appropriate amount of $FeSO_4 \cdot 7H_2O$ and RS were added to double distilled water (< pH = 7), heated to 70 °C, and constantly stirred for 1 h. Subsequently, the paste was heated to 700 °C (heating rate of 5 °C/min) in air at 1 atm and maintained at that temperature for 4 h, before slowly being cooled to room temperature to give NHs.

Photocatalytic activity

In these experiments, 2.0 mL of 0.1 mM MB was mixed with 1.0 mL of H_2O_2 (35% v/v) in a quartz cuvette. Firstly, the mixture was stirred for 30 min in dark conditions to reach the absorption–desorption equilibrium to calibrate the reaction condition. Afterwards, 0.05 g of the NH was added to the reaction mixture and constantly stirred. The sample was then irradiated with a UV hand lamp (6 W, λ = 365 nm, intensity = 0.8 μW cm^{-2}). The absorption spectra were recorded through time-dependent UV–Vis over the scanning wavelength from 200 to 600 nm,at 30-min intervals. The absorption band of MB was taken at 506 nm, and the degradation percentage was calculated using the following equation (1):

Percentage Degradation (%) = $[(C_o - C_t)/(C_o)]$ x 100%(1)

where C_o is the initial concentration and C_t is the concentration at time t.

3. RESULTS AND DISCUSSION

Based on the morphological analysis, the spherical shape of the Sp-HNP was strongly suggested by ImageJ software (version 1.52e, ImageJ2, University of Wisconsin-Madison, WI, USA), as shown in Figure 2. In this case, the hematite particles were found to nucleate and grow in a uniform and mono-disperse direction. The NH showed well-crystallized nano structure materials from 24 to 48 nmhaving spherical-shaped morphology. The steady growth of the hematite was uniform and consistent, which eventually formed a well-ordered crystallites nanoparticles and the ordered spherical structure of the NH.

Furthermore, the NH underwent a photo-catalytic performance evaluation by comparing the absorption spectra of the degraded MB, within certain periods. Figure 3 shows the performance of the prepared catalysts, examined by the degradation of MB for 270 min. Based on Figure 3(a), MB was measured to degrade at 17% upon adding H_2O_2 exposed under UV light irradiation after 30 min. Consecutively, MB further degraded to 31%, 50% and 99%, monitored after 62, 120 and 270 min, respectively. Based on half-life determination, the kinetics photo-degradation reaction obeyed the pseudo-first-order kinetics. The photo-captured images in Figure 3(b) had also supported the photo-degradation process. To indicate the dependency on the UV light, it is worthy to mention that the MB was not significantly degraded in dark conditions. Therefore, the process involved was chemical photo-degradation rather than physical absorption. For comparison, the MB degradation experiment was also performed in different conditions with the presence of H_2O_2 and/or the UV light without the NH. It can be seen that the degradation of MB is hardly initiated without the NH, which confirms its photo-catalytic activity. Nonetheless, the catalytic activity of the NH is comparable to that of the previously reported nanosized hematite as a catalyst (Mansour, 2015).
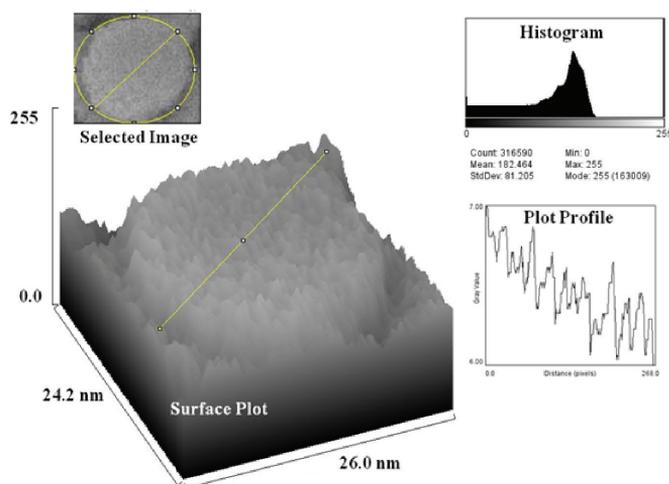
Figure 2: Morphological analysis for Sp-HNP showing the spherical morphology on a surface plot analyzed using ImageJ from Java-based software version 1.52e
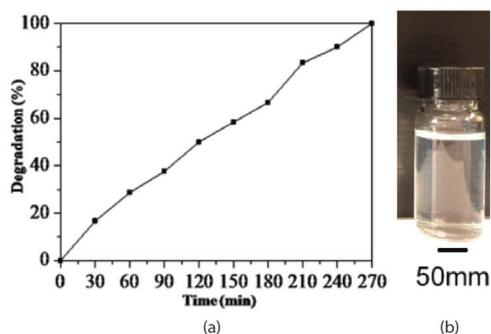
Figure 3: Catalytic activity for the degradation of MB (a) plot of degradation (%) against time (b) photo-captured images for MB/NH/H$_2$O$_2$/UV

4. CONCLUSION

In conclusion, ordered nanoparticles and the monodispersed spherical iron oxide of NH have been prepared by using the starch-assisted method. Based on its catalytic performance, the NH had successfully degraded MB at 99% (after 270 min irradiation under UV light) and obeyed the pseudo-first-order kinetics.

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The Application of Artificial Neural Networks to Predict Student's Academic Performance: A Review Paper

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A B S T R A C T

The purpose of this paper is to review the application of artificial neural networks (ANN) to predict students' academic performance. Academic excellence measured through academic result is generally used as a quality indicator of how good an institution is. An accurate prediction model of students' academic performance would help the institution to identify the at-risk of low achieving students at the early stage and would prepare remedial classes before it is too late. In this study, predicting academic performance using artificial neural networks is reviewed with special attention given to discover the most common data used for prediction. Data such as students' socio-demographic (e.g. ethnicity, gender and economic status) and academic (e.g. type of school and their performance in that school) as well as students' involvement in the extracurricular activities in their previous schools were often used in research associated with academic performance. The architecture of neural network used for successful prediction and problems that normally arise when conducting the research are also of special interest in this review. This research is part of the preliminary work done before developing an artificial neural network model to predict academic performance of Pusat Asasi UiTM students. The findings of this research hopefully can assist in the development of a robust artificial neural network prediction model.

Keywords: Neural networks; academic performance predictor; student performance prediction.

1. INTRODUCTION

According to The Star Online (2018), currently in Malaysia there are 20 public universities, 37 Polytechnics and 105 Community Colleges. There are 477 private higher education institutions, of which 53 are private universities and 36 are private university colleges. The educational services industry is definitely very competitive. Therefore, to remain competitive, an institution needs to improve its academic performance and student learning experience to boost public confidence toward the institution. The ability to predict student performance would definitely be an added advantage for an institution especially if the prediction could be done early. This literature review is part of the preliminary work done before

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developing an artificial neural network model to predict academic performance of Pusat Asasi UiTM students. The findings of this research can assist in the development of a robust artificial neural network prediction model. The two main objectives of this paper are to uncover the most frequent data used in the prediction of student's academic performance with special attention given to data that give more accurate prediction; and the architecture of neural networks that give a better prediction.

2. MOTIVATION TO USE ARTIFICIAL NEURAL NETWORKS FOR PREDICTION

It is already established in many researches and studies, that ANN have the ability to learn and model non-linear and complex relationships, which is really important because in real-life, many of the relationships between inputs and outputs are non-linear and complex. ANN can understand the relationship or mapping between input and output variables during the training process using different learning algorithms (Diryag, Miti , & Miljkovi , 2014). Many of the topics developed in the field of artificial neural networks have now acquired maturity and consolidation. They have proven to be very competitive in the resolution of real-world problems compared to more traditional data-analysis methods, usually based on explicit statistical modelling (Prieto et al., 2016).

3. METHODOLOGY

Several journals were obtained from online academic journal databases through UiTM Library E-Resources such as ScienceDirect. Com, IEEE Xplore, Wiley Online Library and other databases by using the phrase 'predicting student's performance using

artificial neural networks'. All the journals were reviewed and categorized based on the type of data used for prediction and the architecture of the ANN used.

4. DATA AND THE APPLICATION OF ARTIFICIAL NEURAL NETWORKS IN PREDICTING STUDENT ACADEMIC PERFORMANCE

Predicting student performance has long been an important research topic. Data such as students' socio-demographic (e.g. ethnicity, gender and economic status) and academic (e.g. type of school and their performance in that school) as well as students' involvement in the extracurricular activities in their previous schools were often used in research associated with academic performance. Several prediction techniques were also used but for the purpose of this research only studies addressing student performance with the application of ANN were reviewed.

a. (Huang & Fang, 2013)

The input or predictor variables in this study are student cumulative GPA, grades earned in four pre-requisite courses and scores on mid-term exams. The types of neural network models used were the multilayer perception network model and the radial basis function network model.

b. (Marbouti, Diefes-Dux, & Madhavan, 2016)

The data used in this study are grades for attendance, quizzes, and weekly homework as well as team participation, project milestones, mathematical modelling activity tasks, and examinations. The ANN used is a Multi-Layer Perceptron, two hidden layers with half of the number input variables as

hidden nodes.

c. (Costa, Fonseca, Santana, de Araújo, & Rego, 2017)

The data source contains the following students, information: age, gender, civil status, city, income, student registration, period, class, semester, campus, year of enrolling in the course, status on discipline, amount of exercise performed by the student, number of correct exercises, and performance of the students in the weekly activities and examinations. ANN with emphasis given on fine-tuning of three parameters of the Neural Network algorithm: (i) the learning rate of the weights; (ii) the momentum applied to the weights during their updating; (iii) the number of hidden layers existing in the network.

d. (Gray, McGuinness, & Owende, 2014)

The data used in this study are age, gender and prior academic performance. The study also considered psychometric indicators that can be assessed in the early stages after enrolment, specifically, personality, motivation and learning strategies. Neural network and K-Nearest Neighbour were used.

e. (Hoffait & Schyns, 2017)

Data used in this study are gender, nationality and the field of study. Socio-economic factors such as their parents' educational level and occupation were also included. ANN with six neurons in the hidden layer was used as prediction model.

f. (Romero & Ventura, 2012)

In this study, prior academic performance and socio economic were used as data and

the ANN used is a Multi-Layer Perceptron.

g. (Romero, Espejo, Zafra, Romero, & Ventura, 2013)

Number of hours of participation in online forum was used as data and ANN with fuzzy rule indication method were used as prediction model.

h. (Arsad, Buniyamin, & Manan, 2013)

Students' results for the fundamental subjects in the first semester were used as independent variables or input predictor variables while CGPA at semester eight was used as the output or the dependent variable. ANN consists of three layers namely input, hidden and output layers.

5. CONCLUSION

Gender, prior academic results and socio-economic of student were often used as the predictive factor of student performance. It is shown in the related studies that predicting student academic performance using Artificial Neural Networks is valid and reliable with high level of accuracy.

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Parental Education Level: Their Influences in Students' Mathematics Achievement among Form 4 Students in SMK Subang

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A B S T R A C T

Measuring achievement is a major part of the learning process and informs educators of students' talents and progress toward educational goals. Parents' involvement in their children's education could give positive impact to the children academic achievement. The most prominent and direct explanation of the link between parent's education and their children's academic achievement relies on the assumption that parents learn something during schooling that influence the way in which they interact with their children around learning activities in the home. It is assumed that the higher the education level of the parents the better the academic performance of the children. The purpose of this study is to determine the relationship between parent's educational level and children Mathematics achievement in SMK Subang. Besides that, this study is also to determine whether there is a dependency between students' ability to solve operational and application algebraic problems. The study was conducted at SMK Subang with sample selected randomly from among form 4 students. By using descriptive research design, an instrument consists of operational algebraic problems and application algebraic problem were given to the students. Based on the finding of this study, it is revealed that there is a significant difference between students' ability to solve operational and application algebraic problem. However, relationship between parents' educational level and children mathematics achievement are found to be weak.

Keywords: Academic performance; parental education level; mathematic achievement.

1. INTRODUCTION

Mathematics is one of the most important subjects in the Malaysian national syllabus. It involves developing and enhancing numerical ability among students. Form four mathematics subject includes topics such as numbers and numeration, variation, graphs, fractions, logarithms and indices, algebraic processes, solution of equation and finding the area and volume of given objects. Mathematics is considered as one of the most difficult subjects and many students tend to have a negative feeling and reaction toward the subject. Efforts can be done to motivate students to learn Mathematics enthusiastically. Students, teachers, parents and schools all have their own roles in

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the teaching and learning process. Parents can be a motivating factor to encourage children to develop interest in Mathematics and be more confident when solving mathematical problems. This is supported by a statement of (Haberman & Hall, 1973) which stated that one of the essential roles in education is the family itself. Olubadewo and Ogwu (2006) also revealed that students' academic performance can be greatly influenced by their parents' socio-economic status especially in English and Mathematics. These factors also include parental educational levels, neighborhood poverty, parental occupational status and family income. The purpose of this study is to determine the relationship between parent's educational level and children Mathematics achievement in SMK Subang.

2. METHODOLOGY

The methodology used in this study is quantitative in nature. This is a descriptive research and sample survey method was used to collect data. The samples were selected by using a systematic sampling technique. Chi-square and paired sample t-test were used to test the stated null hypotheses. The respondents for this research were 65 Form 4 students from Sekolah Menengah Kebangsaan Subang who took the Integrated Curriculum for Secondary Schools (ICSS). The students were given a set of questions

paper which consists of two parts which were operational and application algebraic test. They were also required to indicate their parents' educational levels. The data was collected and analyzed using Statistical Package for Social Science (SPSS).

3. RESULTS AND DISCUSSION

QUESTION 1:
What is the students' ability in solving operational and application algebra problems?

In the table 1.1, test part A indicates the algebra test that involves operational questions while test part B indicates the algebra test that involves application questions. Descriptively, the mean score of students in test part A is 51.0769; (18.17649) however for test part B the mean is only 34.4923 with SD (24.39782) which is lower than test part A. In conclusion, this shows that the students have the higher ability to solve operational algebra problems than solving application algebra problems.

For the table 1.2, it shows the mean score and standard deviation of the students' test marks and test grades for the algebra test. For the test, the overall mean is 42.7077; SD (19.16191) and mean for test grade is 3.9538 with standard deviation of 1.38554. From this results it shows that most of the

Table 1.1: Mean for the overall score of students in operational and application algebra test

	N	Mean	Std. Deviation	Variance
Test part A	65	51.0769	18.17649	330.385
Test part B	65	34.4923	24.39782	595.254
Valid N (listwise)	65			

Table 1.2: Mean for the overall score and grade of students in algebra test

Descriptive Statistics				
	N	Mean	Std. Deviation	Variance
Test marks	65	42.7077	19.16191	367.179
Test grade	65	3.9538	1.38554	1.920
Valid N (listwise)	65			

students scored the average 43% in this algebra test and most of them had obtained grade D (M = 3.9538).

QUESTION 2:

Is there significant difference between the students' ability in solving operational and application algebra problems?

Based on the table 2.1, test part A indicates the operational algebra test while test part B indicates the application algebra test. As shown in table 2.1, the mean score in test part A (M = 51.0769, SD = 18.17649) was higher than the mean score obtained in test part B (M = 34.4923, SD = 24.39782). The number of students for each test is (N = 65). To determine if the test score for both part A and part B are significantly different or not, a paired sample t-test was conducted.

The paired sample t-test in table 2.2 revealed a significant difference between the ability of the students in solving operational algebra problems and application algebra problems, (t = 6.309, df=64, p <0.05). This indicates that the mean for students' ability in solving operational algebra problems (M = 51.0769) was significantly higher than the mean for ability of the students in solving application algebra problems (M = 34.4923). Thus, simple mean that we reject null hypothesis. To sum up, there is significant difference between the students' ability in solving operational and application algebra problems. It shows that if the students can solve the application algebra problems very well, they also tend to be able to solve the operational algebra problems as well.

QUESTION 3:

Is there relationship between father's

Table 2.1: Descriptive statistic for students' ability in solving operational and application algebra problems

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Test part A	51.0769	65	18.17649	2.25452
	Test part B	34.4923	65	24.39782	3.02618

Table 2.2: Paired sample t-test comparing between students' ability in solving operational and application algebra problems

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Test part A – test part B	16.58462	21.19470	2.62888	11.33283	21.83641	6.309	64	.000

Table 3.1: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Recoded education of father * PT3 mathematics result	62	95.4%	3	4.6%	65	100.0%

Table 3.2: Recoded Education of Father * PT3 Mathematics Result Cross tabulation

Recoded Education of Father * PT3 Mathematics Result Cross Tabulation

Count

		PT3 Mathematics Result						Total
		A	B	C	D	E	Fail	
Recoded education of father	High	3	6	10	5	3	2	29
	Medium	2	0	2	1	0	2	7
	Low	3	2	7	4	7	3	26
Total		8	8	19	10	10	7	62

Table 3.3: Chi-Square Tests
Chi-Square Tests
a. 16 cells (88.9%) have expected count less than 5. The minimum expected count is .79

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.600[a]	10	.390
Likelihood Ratio	11.473	10	.322
Linear-by-Linear Association	1.845	1	.174
N of Valid Cases	62		

a. 16 cells (88.9%) have expected count less than 5. The minimum expected count is .79.

Table 4.1: Case Processing Summary
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Recoded education of mother * PT3 mathematics result	63	96.9%	2	3.1%	65	100.0%

Table 4.2: Recoded Education of Mother * PT3 Mathematics Result Cross tabulation
Count Recoded Education of Mother * PT3 Mathematics Result Cross tabulation

		PT3 Mathematics Result						Total
		A	B	C	D	E	Fail	
Recoded education of mother	High	4	5	6	5	2	3	25
	Medium	0	0	0	1	0	1	2
	Low	4	3	14	4	8	3	36
Total		8	8	20	10	10	7	63

Table 4.3: Chi-Square Tests
Chi-Square Tests
a. 14 cells (77.8%) have expected count less than 5. The minimum expected count is .22

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.518[a]	10	.319
Likelihood Ratio	11.261	10	.338
Linear-by-Linear Association	.509	1	.475
N of Valid Cases	63		

a. 14 cells (77.8%) have expected count less than 5. The minimum expected count is .22.

education level and student's Mathematics achievement?

Based on the table 3.1, the first part of the output indicates the sample size. In this study, there were 65 of students from SMK Subang responded to both area of education level and result. However, there were 3 students who failed to respond to at least one of the two questions which their Mathematics result for PT3 or their father's education level are.

As shown in table 3.2, it gives the chi-square table of education level of father and PT3 Mathematics results of the students for each possible combination of the two variables. In this study, PhD, Master and Degree are considered as the highest level of education while the Diploma is considered as a medium level of education. Lastly, for the lowest level in education are secondary and primary school. For this result, most of the students who have their father with higher level of education get grade C for the PT3 Mathematics while there were 2 students who failed PT3 in Mathematics. Furthermore, for medium level of education, there were 2 students who got for each grade A, C and have failed in PT3 Mathematics. Lastly, most of the students with fathers who are from the lowest level of education got both grade C and E for their Mathematics result. From this result, chi-square was conducted in order to determine whether

there is relationship between father's level of education and students' Mathematics achievement.

Based on the table 3.3, in the first row it gives the values of chi-square test which is 10.600 (DF=10). The last column gives the two-tailed *p*-value associated with the chi-square thus, in this case the *p*-value is 0.390. To sum up, because the *p*-value was (> 0.05) so null hypothesis was accepted. That is, students' achievement in PT3 Mathematics result is not affected by their father's education level.

QUESTION 4:

Is there relationship between mother's education level and student's Mathematics achievement?

Based on the table 4.1, the first part of the output indicates the sample size. In this study, there were 65 of students from SMK Subang responded to both area of education level and result. However, there were 2 students who failed to respond to at least one of the two questions which their Mathematics result for PT3 or their mother's education level are.

As shown in table 4.2, it gives the chi-square table of education level of mother and PT3 Mathematics result of the students for each possible combination of the two variables. In this study, PhD, Master and Degree are considered as highest level of education while Diploma is considered as medium level of education. Lastly, for the lowest level in education are secondary and primary school. For this result, most of the students (6 persons) who have their mother with a high level of education got grade C for the PT3 Mathematics while there were 3 students who failed PT3 in Mathematics. Furthermore, for medium

level of education, there were 1 student who got grade D and 1 student failed in PT3 of Mathematics. Lastly, most of the students (14 persons) with mothers who are from the lower level of education got both grade C for their Mathematics result. From this result, chi-square was conducted in order to determine whether there is relationship between mother's level of education and students' Mathematics achievement.

Based on the table 4.3, in the first row it gives the values of chi-square test which 11.518 is (DF=10). The last column gives the two-tailed *p*-value associated with the chi-square thus, in this case the *p*-value is 0.319. To sum up, because the *p*-value was (> 0.05) so null hypothesis was accepted. That is, the mother's level of education did not give any influence towards their children's achievement in PT3 Mathematics result.

4. CONCLUSION

In SMK Subang, parents' educational level did s not give any influence towards their children's Mathematics achievement. This is opposed to the major belief that the higher the education level of the parents the better the children academic performance. This study also shows that the students in SMK Subang have lower ability to solve application algebraic questions as compared to operational algebraic problems. It also shows that if the students can solve the application algebra problems very well, they also tend to be able to solve the operational algebra problems as well.

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Synthesis of Tetragonal Barium Titanite Ceramic via Simple Sol-Gel Routes

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A B S T R A C T

Highly-purified barium titanate $BaTiO_3$ was successfully synthesized by using sol-gel technique. Barium acetate $Ba(CH_3COO)_2$ and tetrabutyltitanate, $Ti(C_4H_9O)_4$ were dissolved in adequate solvent of glacial acetic acid and ethanol was added as the chemical modifier. The synthesized $BaTiO_3$ nanoparticles were calcined at a temperature range from 700 ºC to 1100 ºC. The powders were further characterized by X-ray diffraction. Fine $BaTiO_3$ powders result indicated the phase of tetragonal structures and high crystallites of $BaTiO_3$. It was observed that the crystallinity and particle size of $BaTiO_3$ was greatly influence by the calcination temperature.

Keywords: $BaTiO_3$, Sol-gel, Ferroelectric.

1. INTRODUCTION

Barium titanate ($BaTiO_3$) has been widely used in industrial technologies due to its versatility. The $BaTiO_3$ ferroelectric, thermoelectric, and piezoelectric properties when it assumes the tetragonal structure allows it to be widely used in multilayer ceramic capacitors, gate dielectrics, waveguide modulators, IR detectors, holographic memory, electromechanics, and nonlinear optics [1, 2]. The ferroelectric properties of $BaTiO_3$ are acknowledged to directly correlate with the size of the materials. Many novel synthesis techniques have been developed to achieve an ultrafine $BaTiO_3$ nanoparticles.

Barium titanate ceramics are typically prepared by the solid-state synthesis routes, in which highly pure $BaCO_3$ and TiO_2 powders are mixed physically, requiring a high temperature sintering process followed by grinding and re-sintering again to produce the $BaTiO_3$[3, 4].The main disadvantage of solid-state synthesis routes is it requires high energy-consumption, low purity and grain aggregation [5]. Sol-gel technique offers a better route to producing a high crystalline $BaTiO_3$ and relatively low temperatures. In

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the present study, we used a sol-gel-based method for the preparation of tetragonal $BaTiO_3$ nanomaterials by using combination of acetic acid and ethanol as the solvent and modifying agent respectively. Combined XRD, SEM characterizations were used to investigate the effects on the morphology of the precursor and the influence of the sintering temperature on the particle size of the powder.

2. METHODOLOGY

The precursor solution of $BaTiO_3$ sample was prepared by synthesized from high purity of barium acetate, $Ba(CH_3COO)_2$ and tetrabutyltitanate, $Ti(C_4H_9O)_4$ with glacial acetic acid and ethanol as the solvent and the chemical modifier, respectively. $Ba(CH_3COO)_2$ was dissolved into hot heated acetic acid at temperature 80°C. Then, $Ti(C_4H_9O)_4$ was added to ethanol with constant stirring using a magnetic stirrer for 0.5 h. Ba^{2+} solutions were then dropped into the $Ti(C_4H_9O)_4$ ethanol solution. The solution was further stirred for 2 hours at 80°C and followed by 24 hours of aging at room temperatures. The transparent gel produced was dried at 80°C for another 12 h to produce the xerogels. Finally, the xerogels was heated at temperatures range of 500°C, 700ºC, 900 ºC and 1100°C. Nanopowder was obtained after grind for 2 hours. Crystalline structures of the nanocrystals were determined by XRD (Rigaku 2500, Kyoto, Japan).

3. RESULTS AND DISCUSSION

XRD analysis was carried out for industrial $BaTiO_3$ and synthesized $BaTiO_3$ nanopowder with 5 different calcination temperatures. The XRD pattern of $BaTiO_3$ industrial and synthesis $BaTiO_3$ is showed in Fig. 1. The results showed a distinctive diffraction peak at $2\Theta = 22.2°$, 31.4°, 38.8°, 45.4°, 51°, 56.2°, and 65.7°. They directly corresponded to the planes of (100), (110), (111), (200), (210), (211) and (220) respectively. The results indicated that the sol-gel synthesized $BaTiO_3$ powders exhibit a perovskite structure as per literature reports. The graph shows that the peak of the $BaTiO_3$ narrowed as the calcination temperature increased. $BaTiO_3$ which calcined at 1100°C have the highest peak intensity to all planes as compared to other samples.
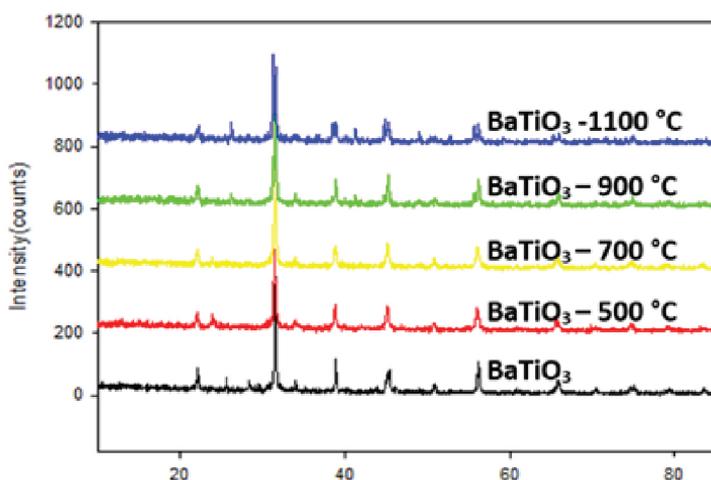
Figure 1: XRD analysis between Industrial $BaTiO_3$ with synthesis $BaTiO_3$ at different calcination temperature
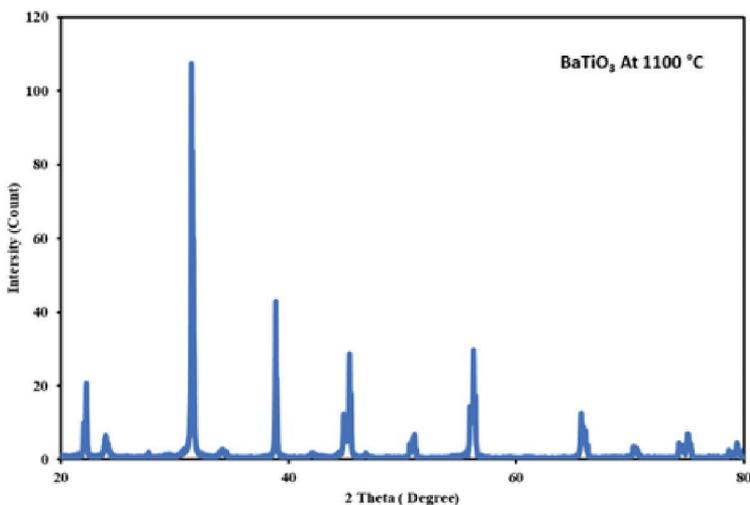
Figure 2: Narrow and highest peak of BaTiO$_3$ at 1100°C calcination temperature
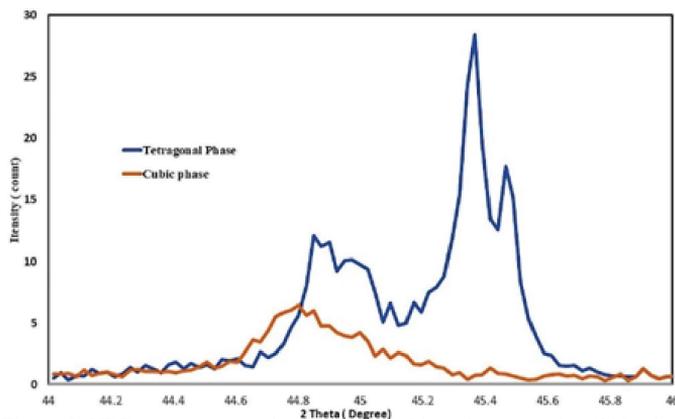
Figure 3: XRD pattern comparison between cubic and tetragonal at (200) plane

Based on Fig. 2, it can be observed that the BaTiO$_3$ (calcined at 1100°C) diffraction peaks (2Θ = 45.4°, 51°, 56.2°, and 65.7°) are broadened and finally split as the calcination temperature increase. This result is consistent with reports by Yu et al. [6], in which they described that the tetragonal structure of the BaTiO$_3$ phase formed well at the higher calcination temperature. Fig. 3 further shows that when the diffraction peak is in between 2θ = 44° to 46° for the industrial BaTiO$_3$ and synthesized sol gel. Obvious split peaks of (0 0 2) and (2 0 0) reflection can be observed. It implies that the tetragonality structure of BaTiO$_3$ occurred at higher sintering temperature, and the ceramic entirely consisted of the tetragonal BaTiO$_3$ phase (JCPDS #No. 5-0626). JCPDS standards indicate the intensities of the split peaks and (0 0 2) and (2 0 0) are completely tetragonal [7].

4. CONCLUSION

The BaTiO$_3$ powders were successfully prepared by sol–gel process using Acetic Acid and Ethanol as the modifier. The powders calcined at 1100 °C for 2 h were all pure BaTiO$_3$ phase fully consisted of the tetragonal BaTiO$_3$ phase.

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Si Microring Resonators: Future Multi-Disciplinary Applications

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A B S T R A C T

We report an analysis on a Si microring resonator (MRR) and its potential in multi-disciplinary applications in the future. With the increasing demand and limitation of electronic devices, there is a need to integrate photonic devices on the electronic chip. However, most of the CMOS fabricated electronic chip are using Si-based material where the nonlinear optical properties is relatively weak. Here, we demonstrate an analysis and switching operation on a Si MRR. The results show the Si MRR is suitable for swithing operation due to the increase of free-carrier concentration in the resonator through two-photon absorption (TPA) effect. TPA effect increases the nonlinearity of the waveguide and the refractive index can be changed with a very low powerpulsed laser source.

Keywords: Microring resonators, optical filter, photonics device, optical sensors.

1. INTRODUCTION

Si microring resonator (MRR) has been extensively investigated worldwide and has recently applied in many disciplines e.g. medical, biophotonics, aerospace, automotive, communication, food industries and military(Chen et al., 2015; Kolli, Srinivasulu, Hegde, Badrinarayana, & Talabattula, 2017; Sun et al., 2017). In the future, it will be the main optical element in the next-generation devices, such as optical switches, filters, logic gates, sensors, and light source generators(Dai et al., 2018; Phongsanam, Teeka, Jomtarak, Mitatha, & Yupapin, 2013; Stern, Ji, Okawachi, Gaeta, & Lipson, 2018). High potential applications of Si MRR are label-free biosensing, biochemical and gas sensors. Si MRR is also a prospect for the next-generation data center (Ahmed et al., 2016; Cheng, Rumley, Bahadori, & Bergman, 2018; Zhou, Chen, Li, & Li, 2018). Another highly potential application of Si MRR is for a high speed and secured communication (Amiri et al., 2011; Nawi, Ali, & Yupapin, n.d.; Sacher, 2015; Yoffe, 2014).

These applications have been proposed and demonstrated by many researchers. However, the problem remains, where it requires strong nonlinear optical properties

in order to change its phase. The main purpose of this paper is to overcome the weak nonlinearity of the Si waveguide by enhancing the design parameters and executing an analysis on the proposed MRR. The enhanced design is expected to reduce the power to change the refractive index of the Si waveguide leading to a change in the phase of the MRR.

2. METHODOLOGY

In this analysis, an add-drop Si MRR structure with the effective refractive index of 3.47 and the ring radius of 5 µm was used. To enhance the nonlinearity, a pumping technique were used on the Si MRR. A pulsed laser beam was used as a pump beam and a continuous wave (CW) laser beam was used as a signal beam. The wavelengths of both beams were set to be different, in which two resonance wavelengths were chosen as 1535.2 nm and 1557.3 nm..The pump beam controlled the free-carrier concentration through TPA effect and hence changing the refractive index of the waveguide. The pulsed pump beam induced the change of refractive index, n according to the Kramers-Kronig equation,

$$\Delta n = -8.8 \times 10^{-22} \, \Delta N - 8.5 \times 10^{-18} \, (\Delta N)^{(\Delta N)}$$

Here Δn was the change in the free carrier concentration. It changed the phase shift of the Si MRR leading to the switch.

3. RESULTS AND DISCUSSION

Figure 1 shows the analysis for the generation rate of free carrier concentration inside the Si MRR. In simulation, the TPA parameter is set at $\beta T = 5 \times 10^{-12}$ m/W and at wavelengths near 1550 nm.The input wavelength is set at 1535.2 nm with the photon energy of 1.2948×10^{-19} J. From

the illustration, as the circulating intensity, Ir inside the Si MRR increases, the generation rate of free carrier concentration also increases. The integration of the generation rate and the circulating intensity gave the amount of the free carrier concentration change created by a single pulse. The generated amount of the free carrier concentration was crucial in order to change the refractive index of silicon material. The change of the refractive index enabled π phase shift for switching. Fig. 2 shows both beams resonate inside the Si MRR. The resonance wavelength of 1535.2 nm is used as the pulsed pump beam since its shorter wavelength gives a slightly higher photon energy, hence resulting a lower switching power.
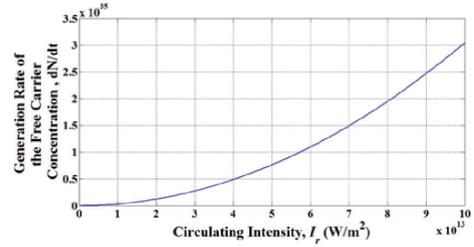
Figure 1: Generation rate of free carrier concentration
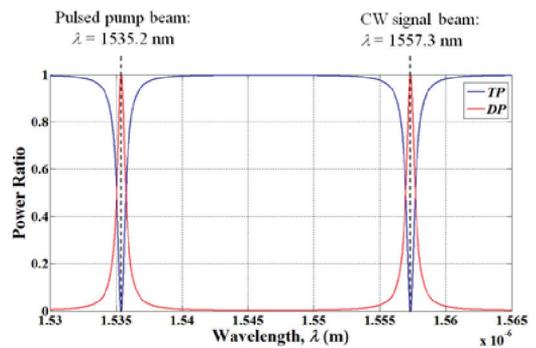
Figure 2: Power ratio as a function of wavelength

4. CONCLUSION

An analysis was successfully done on the proposed Si MRR and the weak nonlinearity of the Si waveguide has been overcome

by enhancing free-carrier concentration through TPAeffect. This effect triggers the refractive index change and the phase shift of the Si MRR with a very low power pulsed laser source.

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Conceptual Luminescence Enhancement of Zn_2SiO_4:Tb^{3+} Sol-Gel Doped

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A B S T R A C T

RE-doped glass brings significant interest in optical communications and full colour displays due to its visible and infrared luminescence. Here, we propose a luminescence enhancement of zinc silicate (Zn_2SiO_4) doped with terbium ion (Tb^{3+}). Zn_2SiO_4 is a good luminescent host material in which it can emit blue, green and red light by integrating luminescence centres of rare earth ions and transition metal ions. Terbium ion in the 3+ valence state radiates luminous green colour when the right wavelength of energy is used to excite the electrons. Terbium is a rare earth element from the lanthanide series which is famed for their unique luminescence properties characterized by broad spectral range. To the best of our knowledge, the work on glass-ceramic Zn_2SiO_4 activated with Tb^{3+} has not been comprehensively investigated. The proposed system is expected to produce higher and sharper green PL intensity at 544 nm. The objectives of the proposed project are to determine the correlation and controlling parameters that would enhance green PL with the presence of Tb^{3+}.

Keywords: Zink silicate, terbium, sol-gel method, luminescence, lanthanide.

1. INTRODUCTION

In recent years, there is a great deal of interest in sol gel glass ceramic waveguides doped with lanthanon ions. It is because of their potential in numerous applications ranging from solid state lasers to electronic displays (Hasegawa, Kitagawa, & Nakanishi, 2018; Q. Y. Zhang & Huang, 2010). Several trivalent rare earths (RE) have been studied for infrared-to-visible emission due to their good luminescence characteristics based on the electronic transition among the 4f energy levels (De Sousa Filho, Lima, & Serra, 2015; Joseph et al., 2008; Zhang & Huang, 2010; Zhou & Yan, 2007; Zur, Pisarska, & Pisarski, 2011).

Terbium (Tb^{3+}) is one of the rare earths (RE) element with atomic number 65. Terbium

(III) cation is brightly fluorescent in a bright lemon-yellow color that is the effect of a strong green emission line in combination with other lines in the orange and red. Thus, terbium ion has very good quality luminescence performance (Hussain, Reddy, & Buddhudu, 2001; Swapna et al., 2014; Yaacob, Sahar, Sazali, Mahraz, & Sulhadi, 2018; H. X. Zhang et al., 2001; Zur et al., 2011). Usually, rare earth ion doped thin film phosphors structures have drawn a particular attention due to applications in flat panel displays (FPDs). According to S. Buddhudu et al, Tb^{3+} doped phosphor was used for green emission at 543nm because Tb has a sharper and more effective emission than manganese (Babu & Buddhudu, 2013; H. X. Zhang et al., 2001).

2. METHODOLOGY

In this project, there are several methods and processes that will be used to develop the thin film. Firstly, the preparation of Tb^{3+} doped Zn_2SiO_4 solutions will be prepared by using the sol-gel technique. Then, the solution will be coated on fused silica substrate by using the programmable dip-coater. Finally, the thin film will be characterized into optical properties by using X-ray diffraction (XRD), atomic force microscopy (AFM), photoluminescence spectrometer, UV visible NIR spectrometer and prism coupler. The solution of $Tb:Zn_2SiO_4$ will be prepared by dissolving 0.04 mole $Zn(Ac)2$ in the mixture solution of 10 ml deionized water and ethanol respectively. Then, 0.02 mole tetraethyl orthosilicate (TEOS) will be mixed with ethanol in the ratio of TEOS:ethanol = 1:4. Zn solution will be added into the TEOS solution gradually under stirring. The terbium acetate will be added into the precursor in the mole ratio of $Tb:Zn_2SiO_4$ equal to 5% and finally, 1 ml of 0.1 M HCL will be applied as catalyst for hydrolysis of TEOS. Therefore, the solution will be obtained greatly transparent and remained stable for some months if it is sealed. The transparent gel could be obtained by exposing the precursor solution to air at humidity 65% for 2 or 3 days at room temperature. We are expecting a strong green emission from $^5D_3$ to $^7F_5$ at 544nm can be obtained by doping the terbium ion with zinc silicate. However, very few studies have been reported for Tb^{3+} doped Zn_2SiO_4 at difference percent. There is no clear ratio of terbium concentration that could induce ion clustering which reducing the emission spectrum. Thus, the maximum doping concentration of terbium in silica substrates for green emission by the sol-gel method will be determined and the best ratio of terbium concentration that could induce ion clustering which reducing the emission spectrum will also be determined at the end of the research project.

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SOCIAL SCIENCE

E-Manual on Experiential Learning: An Innovative Teaching Kit

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A B S T R A C T

Educator needs to explore the effective methods of teaching to create enjoyable learning environment. This research is largely based on the experience of applying experiential learning in teaching a non-law subject to law students at Centre for Foundation Studies, University Teknologi MARA. Based on the research conducted, the feedback shows that 89% respondents prefer learning environment consisting of the combination of conventional method and experiential learning. Besides, research also found that based on students' perceptions, experiential learning is an effective instrument to enhance learners' understanding of the topics, exposing them to the real world and giving them the opportunity to relate and apply the knowledge that they have gained in classroom into real life situations. Respondents also reported that they have acquired myriad of skills through the application of experiential learning such as teamwork, communication, technological, leadership, critical thinking and other soft skills. Thus, researchers took an initiative to design a mobile apps that serves as a quick guide for educators at all level of education to adopt experiential learning as part of their methods of teaching. The mobile apps contains explanation on experiential learning, is proven to give benefits to both learners and educators and examples of experiential learning activities that can assist educators who wish to embark on this method.

Keywords: Experiential learning, effective teaching, conventional teaching method, mobile apps.

1. INTRODUCTION

It is undeniable that teacher's role is very important to bring out the intended outcomes of the curriculum. Knowledge, competencies and experiences of teachers are the central elements to ensure effective learning take place. Most teachers think that teaching is all about them and their role being the centre of the process, while in fact the most important aspect of teaching and learning is the students and what they learn.

The traditional teacher-centred atmosphere of the college classroom has been criticized for not fostering a student's ability to think (Garrett, 2008). The conventional teaching and training are based mainly on knowledge

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or skills transfer, but does not address individual growth and potential particularly well (Mollaei & Rahnama, 2012). A learner-centred approach to teaching on the other hand fosters a deep approach to learning, where learners are required to think critically.

Studies show that the typical student's attention span is about 10 to 15 minutes, even though it is natural for students' attention to vary depending on the motivation and others factors (Wilson & Korn, 2007, McKeachie & Brewer, 2002). Therefore, the modern days educators need to find teaching methods and strategies that can hold and capture the students' attention especially for the easily distracted ones.

This mobile apps is specially designed to assist and provide guidance for educators to apply experiential learning in their teaching. An innovative model for experiential learning is presented based on learning outcomes and skill requirements intended in Malaysian curriculum.

The mobile apps consists of three major contents; (i) the definition of experiential learning, (ii) the guidelines on experiential learning, (iii) 8 examples of experiential learning and in each examples, a brief explanation on the activity, objective, suggested time and size, and benefit were provided.

2. METHODOLOGY

This paper integrates the quantitative and quantitative methods of research. A doctrinal research is adopted in analysing the fundamentals of experiential learning. Abundance of literature were referred to in explaining the experiential learning and its benefits in teaching. Before the development of the apps, we have

conducted a survey on 327 students who have responded positively on the adoption of the combination of experiential learning and conventional method of teaching. This positive response becomes the catalyst for us to develop an apps that can explain the experiential learning to educators in simple way. After the completion of the apps, survey with 77 respondents who have used the apps provided the data needed to assess the effectiveness of the apps.

3. RESULTS AND DISCUSSION

The mobile apps is downloadable by mobile phone users via a link shared by the researchers. However, it is still at trial stage. As at 15 August 2018, 77 users have downloaded the apps and gave feedbacks using google form survey provided. In the first part of the survey, the users were asked whether they have knowledge about experiential learning before using the apps. Based on the response, 20.8% n=16 answered 'No'. It can be summarized that not everyone has the exposure towards experiential learning before.

In the second part of the survey, the users were asked about the content and features of the apps. Based on the data collected, 97.4% n=75 respondents are of the opinion that the content of the apps helps them to understand what is experiential learning. Whereas, 78% n=60 respondents agree that the features of the apps is interesting and attractive.

Lastly, the third part of the survey is regarding suggestions and recommendations for continuous improvement of the apps. Among the suggestions are; inclusion of video of activities, to open the mobile apps to public and to add more features for example forum and inquiry platform in the apps.

4. CONCLUSION

Based on our research, 89% respondents prefer the combination of experiential learning and conventional method of teaching. The combination of these two methods based on the respondents' opinion is effective, interesting and exposed them to the reality instead of only theoretical part of certain knowledge. It also equipped them with various kinds of soft skills. Hence, the development of the apps is necessary to assist educators to employ experiential learning to add value to their teaching method. From the positive feedback received, the researchers believe that the apps is beneficial not just to educator but also to students. The glaring feature of experiential learning makes experience as a way of learning. Thus, it is recommended that this app to be used as a guide in facilitating educator to adopt experiential learning in teaching as an added value to conventional teaching approach.

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Collaborative Learning Approach among ESL Learners

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A B S T R A C T

Poor command of English and poor communication skills have been indicated as among
the main reasons for not recruiting undergraduates and for some graduates to remain
unemployed. These are in tandem with the issue that undergraduates formed 33.8 percent
of over 500,000 job seekers in 2015, thus it is vital to accentuate the need to enhance
their oral proficiency and employability. Nonetheless, oral proficiency has been "sidelined"
compared to writing and reading that are regarded as the focal skills tested in examinations.
Thus, for a successful implementation of policies pertaining to pedagogical practices
aiming to equip ESL learners with essential soft skills, Collaborative Learning Approach
(CLA) is suggested for teachers in preparing suitable activities that will maximise learners'
opportunities for interactive learning and meaningful use of the English language. The
main objective is to investigate how CLA can influence ESL learners' oral proficiency
performance. Quantitative data collection method was employed to extract data from a
randomly selected sample of 50 pre-university students (Foundation in Law) taking English
language courses (ELCs) via a questionnaire survey. The findings showed a positive
attitude towards CLA. Students gained benefits from CLA and recommended CLA as a
good approach to improve the oral proficiency. This work has implications for assisting the
country to produce holistic and balanced graduates, as outlined in Shift 1 of the Malaysia
Education Blueprint.

Keywords: Collaborative learning approach, oral proficiency, improve.

1. INTRODUCTION

Poor command of English and poor
communication skills have been indicated
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undergraduates and for some graduates to
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Nonetheless, oral proficiency has been
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ESL learners with essential soft skills,

Collaborative Learning Approach (CLA) is suggested for teachers in preparing suitable activities that will maximize learners' opportunities for interactive learning and meaningful use of English language. Compared to the 'chalk-and-talk' method which limits creativity, CLA emphasizes on student-centered activities that promote learners' autonomy and active involvement in language acquisition. The main objective of this study is to investigate how CLA can influence ESL learners' oral proficiency performance.

2. METHODOLOGY

This study will employ quantitative data collection method in view of investigating the research question. A total of 50 ESL pre-university learners (Foundation in Law) from Centre of Foundation Studies, Universiti Teknologi MARA (UiTM), Kampus Dengkil, will be used as sample. In determining the research question, quantitative will be obtained via 30-item questionnaires adapted from Ingleton (2000). According to Pandey and Pandey (2015), questionnaire is the most efficient form of collecting data as it can gather information from extensively scattered data. Questionnaires will be distributed to respective ESL lecturers to be administered in class. A random sampling method will be used to select the samples / subjects of this study. As stated by Pandey and Pandey (2015), random sampling is used so that each member of the population has an equal opportunity to be included in the survey.

3. RESULTS AND DISCUSSION

Using Likert Scale, respondents were to rate each item based on their learning experience in English Learning classroom. Generally, students agreed that Collaborative Learning

Approach gives a lot of benefits to them in terms of academic, social and in developing soft skills. Majority of the respondents agree that CLA may help them understand the lesson better, expand their knowledge, develop critical thinking and problem solving skills, motivate others to join in the lesson as well as make the lesson more fun and engaging. It can also be said that, respondents do not agree to the statement CL is such a waste of time explaining the task to others.

However, very small percentage of the respondents has negative feedback towards CL. These respondents believed that CLA could not create a more relaxed atmosphere (19.3%). In addition, a small number of respondents do not agree that working in pairs and groups may foster rapport with their classmates (14.9%). Only 22.4% of the respondents prefer to choose their own group members. Hence, generally, it can be said that, majority of the respondents prefer having CLA as part of their learning activities.

An open ended question was administrated to the participants to elicit more elaborate responses. The question was on their overall opinion/ suggestion on CLA. The results were presents in Figure 1.

Figure 1 shows that 25% mentioned that CLA is effective in improving communication skills in classrooms. 12% agreed that CLA gives motivation. 8% agreed that CLA promotes social skills. Lastly, 5% agreed it improves creativity and knowledge.
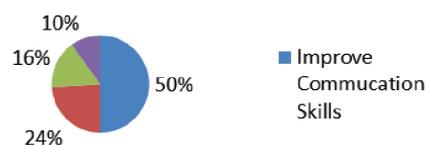
Figure 1: Responses of written comments

4. CONCLUSION

Findings of the survey indicated that the respondents had great learning experience in classes that incorporated CLA. The involvement of CLA made learning more enjoyable and engaging. They were able to help their group members to understand the lesson better, thus, stimulate critical thinking skills to solve problems given.

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Non-Negotiated Small Print Clause: A Consumer Barrier?

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A B S T R A C T

Consumers who are vulnerable faced with a contract containing 'non-negotiated small print clause' do not know what it contains or understands the effect of the clause. Exclusion clauses may deprive a consumer is likely to be at a disadvantage. Very often they are introduced in ways which consumers are being confronted with an even worse position. To strike at the heart of inequality, efforts must be made to minimize the disparities between consumers and traders. Part IIIA of the Consumer Protection Act 1999 (CPA 1999) in Malaysia, allows consumers to identify between procedural unfairness and substantive unfairness under section 24C & 24D. By applying the content analysis research method, this article aims at exploring the legislative intervention on unfair terms in Malaysia specifically exclusion clauses. At the need of the analysis, some suggestions are made to help solve the identified drawbacks of the statute.

Keywords: Consumer protection, Consumer Protection Act 1999, exclusion clauses, unfair terms.

1. INTRODUCTION

The 21st century has seen the rise of consumerism as an instrument of market protection. The rise is seen as a paradigm shift from the laissez-faire legacy which upholds the idea of freedom of contract. The consumers within the modern economy are faced with unequal bargaining power, thus demanding protection for those vulnerable and weak groups. Inequality of bargaining power is the primary justification for the protection of the weak and vulnerable group, commonly known as consumers in a modern market economy. The disparity in knowledge between consumers and traders left consumers with insufficient information to determine which terms in consumer contracts are fair and balance. Thus, consumer protection laws are designed to ensure fair dealing between traders and consumers by eliminating unfair terms precisely exclusion clauses from gaining an advantage over consumers in consumer contracts. This paper deals with the legislative approach to unfair terms in consumer contracts specifically exclusion clauses in Malaysia.

2. METHODOLOGY

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This research falls under legal research and as such legal method has been used to collect, discuss, explore, explain, test, verify, interpret and present the required data and findings. Data gathered was analyzed adopting the four legal research approaches, the historical, jurisprudence, comparative and analytical and critical approaches with a view of reforming the law on the given subject matter. The objectives are to analyze the main problems as provided by the Consumer Protection Act 1999; and suggest by way of reform for Malaysia new rules and principles to overcome the problems highlighted.

3. RESULTS AND DISCUSSION

Incomprehensible contracts are one of the main reason consumers do not read contracts. Consumer contracts are incomprehensible according to format (fine print, long lines, and small spacing) and language (including to overuse of legal terms). Consumers are unable to negotiate terms in contracts takes away the incentive for consumers to read and understand the contracts they sign. Even if the product is not a necessity, consumers may sign a contract without a careful reading because they expect that every term is accurate.

Procedural unfairness refers to the very process of contract development. For instance, a purchaser is unaware of a term due to its small print at the time of signing a contract. Meanwhile, substantive unfairness focuses on the process outcome, for instance, the contract content. It is appropriate to distinguish between typographical and linguistic readability. Quite often a contract is physically illegible because of font size or even the colors and makes suggestions as to the font size, colors, layout and headings to conform to everyday language. According to Newman linguistic, readability deals with "legal matters" and the use of "legal language." For the average consumer, a "legal" grammatical formulation may be incomprehensible and is often the most significant deterrent to consumers reading contracts. It is appropriate to simplify legal terms, passive verb usage and the avoidance of cross-references to assist in linguistic readability and understandable language.

In Malaysia, Consumer Protection Act 1999 (CPA 1999) appears to be the principal statute that upholds consumer protection. Part IIIA covers exclusion of liability for both the tort of negligence as well as a contractual obligation. Section 24(C) defines terms that are unfair as, "terms in a consumer contract which, concerning all the circumstances, causes a significant imbalance in the rights and obligations of the parties arising under the contract to the detriment of the consumer." Part IIIA emphasizes consumer protection and abhors unfair terms found in B2C contracts of standard form, including unfair terms commonly found in invoices, sale documents, and receipts. The phrase 'significant imbalance' has yet to be defined by the Act.

Whereas section 24D(1) of CPA 1999 provides that a contract or a term of a contract be substantively unfair "…if the contract or the term of a contract …(d) excludes or restricts liability for negligence; or (e) excludes or restricts liability for breach of express or implied terms of the contract without adequate justification and if it involves harsh, oppressive and unconscionable." CPA, however, does not define the words 'unconscionable', 'oppressive' and 'harsh' or the circumstances in which each will arise. Section 24D(2) provides a list of circumstances for terms or the contracts to be held void or unenforceable

for substantive unfairness. Section 24D(2) on general substantive unfairness should be focused on the wordings of the contract rather than the contract procedure.

4. CONCLUSION

Recommendations as follows:

a) Insert new interpretation of vulnerable consumers in Part IIIA of CPA 1999 to include a separate group of consumers.
b) Publish a Handbook on Consumer Protection for vulnerable consumers
c) Develop on-line interactive and distance learning tools for PWDs consumers
d) Establishment of a webpage and database "unfair contract terms" and individual consumer guidance tailored to vulnerable consumers.
e) Business and legal writers must write for the person with minimal experience; in other words, a first-time user of goods and services.
f) To rethink coherent language policy and take it into account when assessing deceptive and unfair trade practices.

Thus enacting specific laws as a legislative measure is needed to control the use of exclusion clauses in consumer contracts as the law must also be abreast with the society's current needs and consumer protection in this 21st century. It will be the best solution to this problem in Malaysia, for the best interest of consumers. The role of the law must be able to regulate exclusion clauses as one of the unfair terms in consumer contracts when the aim or objective of the law is to reduce the gap of inequality of bargaining power between traders and consumers and justice in e-commerce consumer contracts too, especially when consumer protection is at the forefront.

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The Use of Reading Strategies Among Malaysian ESL Undergraduates when Reading Print and Hypertext

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A B S T R A C T

This present study explores the reading strategies of Malaysian ESL Undergraduates when reading print materials and hypertext. The survey of strategies used when they read in both media originated from the theoretical framework of metacognition, thus this study adopted mixed methods approach. Learners' awareness of the metacognitive reading strategies was investigated through questionnaires known as MARSI and OSORS, in which the subjects reported their use of strategies while the qualitative data were gathered using verbal protocols. From these two methodological approaches, this study aimed to differentiate the learners' use of strategies when they engage in reading tasks of two different media – traditional print reading as well as hypertext. Apart from that, the difficulties of reading from the screen-based platform was also elucidated in this paper. The data gathered showed that the use of reading strategies was similar in terms of the proposed metacognitive strategies categorised into the three subscales; Global, Problem-Solving, and Support strategies with varying degrees dependent on the medium of reading. The present study found higher frequency of strategy use when the learners read online, although, in general, they employed Problem-Solving strategies significantly higher than strategies of other subscales. This led to the discovery of reading difficulties among themselves, in terms of textual display, vision problems, and restricted access to materials.

Keywords: Strategies, metacognition, print, hypertext, difficulties.

1. INTRODUCTION

The construction of meaning through the interaction between the readers and the text depicted reading as an active and fluent process. More often than not, learners' abilities – in particular, among those learners of English as their second language, demonstrated reading performance which was below average, as compared to reading in their first language (Zarrabi, 2015). Therefore, this present study seeks to classify and analyse the types of strategies used by Malaysian ESL Undergraduates when reading print and hypertext through addressing the following research questions;

1. What strategies do students use when reading print materials?

2. What strategies do students use when

reading hypertext?

3. Is there a difference in the use of reading strategies when reading print materials and hypertext?

4. What are the difficulties ESL learners face when reading online?

This study employed mixed method design hence the findings reflected both quantitative and qualitative data. In this paper, it is contested that there will be differences between the use of reading strategies when students read print materials as compared to reading hypertext. The descriptive analyses on the reports of participants' use of reading strategies (print vs. hypertext) during the first phase of the study were provided. Then, Think-Aloud sessions were conducted to explore the strategies used by the subjects while reading the academic texts in both media.

Reading comprehension

Learners need to recognise the cognitive abilities i.e. skills and strategies required to be in control of their reading while concurrently applying them accordingly in order to attain reading comprehension. This concurs with Grabe and Stoller's (2011) description of "fluent" comprehension in reading – an *interactive* process. These virtual cognitive interactions revealed the role of working memory (Baddeley, Eysenck, & Anderson, 2009); from rapid word recognition to sentence analysis up to monitoring learners' comprehension as reading takes place.

Metacognitive reading: the skilled readers

Describing characteristics of skilled readers

from the viewpoint of (metacognitive) strategy use was mainly attributed to their problem solving skills i.e. possession of traits like conditional, declarative, and procedural knowledge (Razi&Cubukcu, 2014). Mokhtari and Reichard (2002) also addressed that the grasping of textual information on the surface through general world knowledge prior to making valid inferences about the texts as the trait which sets skilled readers from the unskilled ones.

Hypertext reading

The use of strategies for learners to achieve comprehension when reading print and hypertext should differ. Several studies have provided evidence for this claim e.g. Coiro, 2011; Coiro&Dobler, 2007; yet surprisingly, the difference noted was in a way that strategies predicted for use in print reading were prevalent in reading hypertext, but the latter necessitated additional comprehension skills and strategies.

2. METHODOLOGY

This study adopted a mixed methods design i.e. reading research survey (quantitative) and verbal protocol reporting (qualitative) to inform each other thus fully explaining the phenomenon (Kymes, 2007). Limitations of this research design were noted i.e. verbal protocols are likely to involve a small sample size (Schellings, Aarnoutse, & Van Leeuwe, 2006), besides the conformation to the existing construct of metacognitive strategies i.e. questionnaires on print reading by Mokhtari and Reichard (2002) and its adapted version by Anderson (2003) for online reading. Within the boundary of this present study, English language proficiency is considered to be of higher importance (cf. gender) in becoming "accomplished readers" – the responsiveness to deal with

the complexities of reading on the Internet (Afflerbach& Cho, 2009). This enabled the participants to report quality verbalisations, hence significant use of strategies. The selection of samples i.e. five female undergraduates who are currently enrolled in the TESOL programme at The University of Nottingham (Malaysia Campus) was made based on their ability to fulfil the task of verbalising their thoughts in English during the verbal protocols.

3. RESULTS AND DISCUSSION

A paired-samples t-test was conducted to determine whether there is a statistically significant mean difference between the use of reading strategies in two different media. The t-test results showed a non-significant trend (t (4)= 2.449, p = .07) towards the predicted direction of having differences in the use of strategy i.e. asking themselves questions they like to have answered while reading the hypertext ($M = 2.8, SD = .447$) as compared to reading in print ($M = 2.2, SD = .836$). Meanwhile, no significant differences between the use of reading strategies were found in the remaining items (all $p> .05$), thus the null hypothesis failed to be rejected. Similarly, a paired-samples t-test on each subscale, simultaneously comparing MARSI and OSORS was also carried out. It can be deduced that there are differences in the use of strategy i.e. the students use more Global strategies when they read hypertext (t (4) = 8.157, p = 0.001) than reading in print version. Problem Solving strategies are second to be commonly used by the students as when they read online (t (4) = 9.179, p = 0.001). However, there was no significant difference between the use of reading strategies with respect to the Support subscale (t (4) = .237, p = .825; thus the hypothesis is accepted.

Discussion

The subjects reported the highest usage of Problem-Solving strategies, followed by those from Global and Support subscales accordingly. Problem-solving strategies while reading illustrated a combination of both deliberate actions and cognitive abilities to achieve reading comprehension. Therefore, the need for learners to have self-regulation over their own skills and strategies is essential in reading, in which their metacognitive awareness is noteworthy. Similarly, the data obtained from OSORS depicted learners' employment of metacognitive awareness which followed the sequence of frequency of that when learners read in print: Problem-Solving, Global, and Support. Six out of the eight problem-solving strategies were those used in print; *reading slowly*, *getting back on track when they lose their concentration*, *adjusting reading speed*, *pay closer attention to text*, *stop from time to time to think*, and *rereading* text for understanding. However, learners reported the additional use of *visualisation for memorization* and *distinguish fact and opinion* strategies when they read hypertext.

Think-aloud activity

The think-aloud activity as learners read text in print demonstrated their use of Cognitive subscale, followed by Metacognitive subscale, and Support subscale. Reading hypertext, meanwhile, showed a slight increment of Metacognitive subscale whilst the remaining subscales were reported to be equivalent. The least percentage of 50% from this qualitative finding confirmed the learners' awareness of their reading strategies. Additionally, the subjects in this study(despite satisfying the notion of being skilled readers) stressed their preferences to

read print materials over reading hypertext based on a single reason i.e. note taking (Support). The retrospective interviews also provided insights on the learners' difficulties related to online reading, based on three premises; textual display (the length hindered the act of navigating i.e. scrolling down the text strained the eyes), the vision problem (astigmatism and visual impairment which are notable factors which impeded reading), and the access (some scholarly articles required them to purchase for full access).

4. CONCLUSION

The notion of metacognition is therefore prevalent in reading research following the subjects' awareness of metacognition following the use of all metacognitive strategies, irrespective of the textual forms nor the shift in medium.

Limitations of study

The small number of samples for this study was inevitably underpowered to represent the findings of this study, hence hampering the generalisation of the effect size.

Pedagogical implications

This study shall inform its learning context that cognitive played a major role to understanding learners' metacognition – the use of metacognitive strategies was significant on top of its awareness among highly skilled readers. Therefore, language teachers should note how these cognitive processing interact with other factors e.g. affective.

Implications for further research

Research on *reading instructions* should be made extensive in order to revise the existing practices to teaching reading and its materials. Metacognition, as part of the integral domains to explain reading comprehension, should be made tangible to students of this age i.e. integration of higher order thinking skills.

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The Relationshıp between Motivation and Willingness to Communıcate in Englısh: A Study of TESL Foundatıon Studies Students in UiTM

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A B S T R A C T

Motivation can be defined as a powerful desire to learn and the satisfaction experienced in the process of learning and achieving learning outcomes, while willingness to communicate reflects the individual's intention to initiate communication and be involved in conversations regardless of any situation. These elements on their own play a crucial role when learning and acquiring a second language. 100 TESL foundation studies students from UiTM Dengkil, Selangor, were selected as the respondents in this study to investigate whether there is a significant relationship between motivation and willingness to communicate in the English language. Guided by one research question, this study has employed the Pearson Correlation Coefficient test for data gathering and analysis. The findings show a positive and significant relationship between motivation to communicate and the willingness to communicate in English ($r = .664$) in a sense that the higher the motivation, the higher the willingness to communicate in English amongst the respondents. This shows that the majority of the respondents in this study were highly driven and encouraged to be willing to communicate in English, especially if they are put in a relaxing and non-threatening environment. The findings could contribute to educators' knowledge and actions in teaching their students and, at the same time, instill the latter's interest and participation when using the language in communicating. Not only that, but they could also assist in the creation of a more friendly classroom atmosphere to encourage students to be more willing to communicate in English.

Keywords: Motivation, willingness to communication.

1. INTRODUCTION

The elements of motivation and willingness to communicate stand to play a crucial role when learning a second language. It is important for second language learners to put an effort and desire in learning and acquiring the second language competently, as according to Gardner (1985), motivation is the association of effort and desire in

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order to obtain the goal of learning the language with suitable attitudes in learning the language. From observation, a large number of TESL students who enrolled in the foundation program have been found to lack in English proficiency. As university students, English is important and they are already expected to be highly proficient in English (Ming, Siew Ling, and Mohd Jaafar, 2011). This might be due to a few factors which affect their process of acquiring the language such as they lack motivation and willingness to communicate in English ever since they learn the language at schools. Thus, this study embarks on investigating both the variables. The research question is to find out whether there is any significant relationship between motivation and willingness to communicate in English amongst TESL foundation students in UiTM Dengkil, Selangor, Malaysia.

2. METHODOLOGY

In order to assess the significant relationship between motivation and willingness to communicate among the second language learners, 100 TESL foundation studies students in UiTM Dengkil, Selangor were taken as respondents via simple random sampling. The questionnaire is divided into three sections which are the demographic details of the respondents, motivation towards communicating in English and willingness to communicate in English.

Statistical Package of Social Science (SPSS Version 20) software was utilized to provide the findings to the research question outlined in the study. The quantitative data was then further analyzed and explained using the Pearson Correlation Coefficient test.

3. RESULTS AND DISCUSSION

Table 1 presents the value of overall relationship between motivation and willingness to communicate in English (R= .664, p = .000). This indicates that there is a positive and significant relationship between motivation and willingness to communicate in English.

Table 2 shows the result of Pearson Correlation Coefficient analysis between motivation and willingness to communicate in English according to dimensions in English amongst the TESL students in UiTM Dengkil, Selangor, Malaysia. Overall, the findings indicate that the higher the motivation, the higher the willingness to communicate in English amongst the TESL students in UiTM Dengkil, Selangor, Malaysia.

4. CONCLUSION

The findings of the study show that the willingness to communicate in English is significantly influenced by the motivation to communicate. Based on the individual

Table 1: Overall relationship between motivation to communicate and willingness to communicate in english amongst TESL foundation students in UiTM Dengkil, Selangor, Malaysia

		Motivation to communicate	Willingness to communicate in English
Motivation to communicate	Pearson Correlation	1	.664**
	Sig. (2-tailed)		.000
	N	100	100
Willingness to communicate in English	Pearson Correlation	.664**	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2: Correlation between motivation to communicate and willingness to communicate in english according to dimensions

		Motivational Intensity	Integrative Orientation	Instrumental Orientation	English course evaluation	Willingness to communicate in a non-threatening environment	Willingness to communicate in an academic setting
Motivational Intensity	Pearson Correlation	1	.770**	.421**	.442**	.644**	.510**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	100	100	100	100	100	100
Integrative Orientation	Pearson Correlation	.770**	1	.472**	.518**	.598**	.493**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	100	100	100	100	100	100
Instrumental Orientation	Pearson Correlation	.421**	.472**	1	.483**	.389**	.381**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	100	100	100	100	100	100
English course evaluation	Pearson Correlation	.442**	.518**	.483**	1	.464**	.348**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	100	100	100	100	100	100
Willingness to communicate in a non-threatening environment	Pearson Correlation	.644**	.598**	.389**	.464**	1	.775**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	100	100	100	100	100	100
Willingness to communicate in an academic setting	Pearson Correlation	.510**	.493**	.381**	.348**	.775**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	100	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

relationship analysis, the dimension of motivational intensity and the dimension of willingness to communicate in English in a non-threatening environment recorded a strong and positive relationship (r = .644). This shows that the majority of the respondents in this study were highly driven and encouraged to be willing to communicate in English if they are relaxed and in a non-threatening environment. This finding can be supported by Riasati (2014) that mentioned students are willing to speak more if the classroom environment is secured and relaxed.

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The Awareness of Retirement Planning: Preliminary Study in UiTM Puncak Alam Campus

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A B S T R A C T

This study investigates the level of awareness of retirement planning among staff at Universiti Teknologi MARA (UiTM) Puncak Alam Campus which to date has received very little research attention. The results indicate that the level of awareness is still at a moderate level which leads the investigations to identify the determinants that influence the adequate level of awareness among those employees in preparing for their retirement. There no doubt that many people make the mistake of not taking retirement planning seriously enough. However, there are three things we cannot avoid in life – taxes, death and retirement. Hence, getting educated and securing retirement plan is not an option. Hopefully by discussing the practical implications of not preparing for retirement days, would help much to avoid missteps and to navigate our retirement days with lots of confidence and pleasure.

Keywords: Awareness, retirement planning.

1. INTRODUCTION

The awareness of retirement planning has been analysed to be low in many people (Fazli Sabri, 2014). In the International Journal of Academic Research in Economics and Management Sciences, individuals are encouraged to start planning for their retirement life earlier before embarking on the golden age and not on the verge of the retirement (M. Krishna Moorthy, 2012). Therefore, retirement planning should become a vital concern of the employees. According to Hunt (2009), Malaysians have little confidence about preparing retirement plan due to financial illiteracy. Besides that, according to Life Insurance Association of Malaysia (LIAM), only less than 5% of Malaysians are ready for retirement (Habib, 2007). The younger generation today, especially working individuals think that retirement planning is a burden for them because it involves long-term planning.

According to Anna (2013) in Journal of Education and Practice, the concept of retirement gives a different meaning to different individuals. While some people view it positively and await it with happiness, others have negative perceptions about

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retirement as they associate that period of life with boredom, economic hardship and death. Retirement had been considered as a complex and long-lasting psychosocial process (Zappala and Depolo et.al, 2009).

Other than that, in reality, people begin to realise that they   cannot afford to retire because they do not have early financial planning and lack of knowledge about putting aside money for their retirement period. Lack of awareness of the employees also contributes to this situation making retirement planning an essential issue in the employee's life. The Statistics of Labour Force, Malaysia, and January 2010 series 7 March 2010 demonstrated that the number of the employed person increased by 3.4 percent in January 2010 to 11.1875 million as compared to 10.827 million in January 2009.

Statement of the problem

From this study, we discovered that people nowadays focus more on their needs and desires such as having big cars, houses, business, career but they forget one important thing in their life, saving and planning for retirement. Not many people are aware of this important thing. According to M. Krishna (2012), the pre-retirees and workers are woefully unprepared for their golden retirement years.

According to Dr Naz (2007), only 5% of Malaysians were prepared for retirement. Despite a growing awareness for the need to prepare for one's retirement, many do not translate their plans into action. Other than that, low financial literacy contributed to the poor retirement planning.

Being well-prepared for retirement and saving for retirement are two things that are interrelated. When people start saving, they are thinking about their future. A person or household is considered prepared for retirement when accumulating savings insufficiently high to generate income at least equal to the given pre-retirement level of consumption (Yuh, Montallo & Hanna, 1998). Not all people have savings, especially for their retirement period. However, have for those that have saved, they prepared a strategic plan for their golden age. An individual who actively saves for retirement tends to have a higher level of retirement preparedness and confidence. As retirement planning is a complex process which requires a certain level of financial knowledge, there is no doubt that financial literacy and retirement confidence are highly correlated as well (Lusardi, 2009; Lusardi & Mitchell, 2008, Lusardi & Mitchell, 2010; Mullock & Turcotte, 2012). According to Huston (2010), financial literacy is a skill that can help people make financial decisions effectively.

This paper thus attempts to address the level of awareness among staff at UiTM Puncak Alam Campus about their retirement planning. The questionnaires were distributed to the academic and non-academic staff to get information for this study. Specifically, this study was conducted based on the following research questions:

1. What is the level of awareness among staff concerning retirement planning?
2. What are the factors that significantly influence the level of awareness of staff in retirement preparedness?

2. METHODOLOGY

The Subjects

The Respondents involved in the present study comprised the academic and non-

academic staff of Universiti Teknologi MARA (UiTM), Puncak Alam. Out of the 100 survey forms distributed, 75 were returned, yielding a response rate of 75%.

Instrumentation

The statistical tools adopted in this study were frequency analysis, reliability analysis, descriptive analysis and correlation analysis. A structured, self-administered questionnaire was developed as a mode of data collection. The 5 page survey forms were distributed to the staff at the appropriate time. The respondents were asked to read the instructions thoroughly so that they could provide the answers accurately. The questionnaire comprised three sections; Staff's profile, Level of Awareness and Factors that influence the Awareness.

In section A, respondents were asked to furnish demographic information such as names, gender, educational level, monthly income and expenses. This information is required to allow matching of data with the data of awareness level using the Pearson Correlation Coefficient (PCC) which indicates the direction, strength, and significance of the bivariate relationships among all the variables that were measured at an interval or ratio level.

The sets of questions in Section B were intended to measure individual's awareness of retirement planning. Descriptive analysis was used to measure the minimum, maximum, mean and standard deviation for the awareness of retirement planning among staffs at UiTM Puncak Alam Campus.

In Section C, the Factors that influence the level of Awareness were determined by requiring the respondents to identify the reasons why they had been delaying the retirement preparedness by answering the survey forms. Due to the nature of the nominal scale used, Reliability Test was used to explain the reliability of each factor (independent variables) that influences the awareness.

The Respondents

The majority of staff approached were female (62%) and the rest were male (38%). This is a common scenario in public service whereby the percentage of female workers in public sectors tends to outnumber the male workers. Obviously, the numbers of respondents who have tertiary education were 75% since the respondents work in a higher education centre.

3. RESULTS AND DISCUSSION

Level of awareness

The data was collected from 75 respondents among the academic and the non-academic staff of UiTM Puncak Alam Campus. Data collected through questionnaires were uploaded into Statistical Package for the Social Science (SPSS) by coded data entry, edited data and data transform to get findings of the study. From the findings, it showed that majority of the non-academic staff had a low awareness level of retirement planning whereas adequate numbers of the academicians had prepared the financial planning for retirement. Descriptive analysis was used to measure mean and standard deviation for the independent variables, and it showed that the results range between 2.00 to 3.00 of mean which demonstrated an adequate level of awareness of retirement planning among the UiTM staff generally.

The financial preparation is the highest mean rating (3.1976) indicating that financial

readiness was what the respondents was most concerned about during retirement. However, most of the respondent were confident that their pension and EPF are enough to care for them during retirement (2.9934). With respect to the readiness toward retirement, it is encouraging to see that the respondents perceived that they were not worried about their life after retirement with a mean of 3.0503. Therefore, some of the respondents looked forward to retirement with a mean of 2.9133.

However, one of the most overlooked areas of retirement planning is estimating what healthcare costs could be in retirement and included this in the calculation of income needs. Healthcare cost is a huge expenditure to plan for on top of normal living expenses. In Malaysia, medical cost is increasing at the rate of between 10% and 15% every year and treatments for diseases and injuries that are usually inflicted on elderly patients are rather expensive. So, having adequate reserves and a good medical coverage can be the difference between a comfortable retirement and one filled with challenges (ibid, 2016).

Nevertheless, the majority of the staff realised the importance of financial planning and savings for their future but not for retirement period respectively. The staff know how much their monthly income and manage it in a proper way and also allocate sums of money for the savings in Amanah Saham Berhad (ASB) and Tabung Haji. Besides that, some of the staff have their own Employee Provident Fund (EPF) and some option for pension.

The factors that influence the awareness of retirement planning

The factors that influence the awareness were determined by three independent variables (IV); which were knowledge, financial literacy and financial planning. Using Reliability Test, the three IV were accepted and considered as reliable for this research based on the Cronbach's alpha. Cronbach's alpha is a reliability coefficient that indicates how well the items in a set are positively correlated to one another. Cronbach's alpha is computed in terms of the average inter-correlations among the items measuring the concept. The closer Cronbach's alpha is to 1, the higher the internal consistency reliability (Sekaran, 2013).

In conclusion, from the Correlation Analysis, results showed that the independents variable; Financial Literacy and Knowledge had a moderate relationship and interrelated whereas Knowledge, Financial Literacy, and Financial Planning had a strong relationship towards the awareness of the retirement planning.

4. CONCLUSION

This study has fulfilled the two objectives set forth. In general, we concluded that the level of awareness of the retirement planning among UiTM staff is still at the adequate level. The study also has addressed various important factors that lead to the lower level of awareness regarding retirement planning. It is hoped that the suggestions above would shed some lights to the relevant authorities in planning and conducting necessary programs for the staff in ensuring they continue to seek knowledge for their own understanding and future benefits relating to retirement planning.

Perhaps the most significant limitation of the study is the small size samples and that the study was conducted only in Puncak Alam

Campus. Since this is a preliminary study, it is hoped that more advanced research would be conducted in the future in order to reach general conclusions and better recommendations to spread the awareness on retirement planning among employees and this study can be used as a basis for further exploration.

However, there are three things you cannot avoid in life – taxes, retirement and death. Hence, getting educated and securing retirement plan is not an option. Discussing the practical implications of not preparing for retirement days would help much to avoid missteps and to navigate these waters effectively.

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Money Hunting Kit: Entrepreneurial Treasure Hunt

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A B S T R A C T

Money Hunting is an education-based gamethat provides a fun way of learning and creates entrepreneurial mind-set for players. This kit contains a manual containing instructions on how to carry out a 'treasure hunt' type of game. Apart from the manual, this kit also contains a map, cue cards and some items related to the relevant checkpoints. Participants are required to complete certain task at each checkpoint to qualify them to get clue for the next checkpoint. Each task is designed for a specific attribute related to entrepreneurship and team building, namely branding, labelling/ packaging, promoting/ marketing, risk-taking, teamwork, strategizing and perseverance. All these attributes are very significant to an entrepreneur. Concise information regarding each entrepreneurial component is provided with the intention to educate the participants. At the last checkpoint, the participants are required to come up with their own product(s) by applying the information they have acquired. The first group to finish the task and create a product that stands out from the rest will be the winner. One unique feature of this treasure hunt is that it can help educate students while they are having fun playing the game on entrepreneurship in an adventurous and exciting way. It is a game suitable for secondary school students, as well as students at higher learning institutions. To the authors' knowledge, this kit is the first of its kind and is not yet available in the Malaysian market to date. Therefore, the authors believe that this product has a commercialisation potential that will proves that learning is not merely 'chalk and talk'.

Keywords: Educational based game, entrepreneurial mind-set, treasure hunt kit, entrepreneurship education.

1. INTRODUCTION

Entrepreneurship is one of the important factors contributing to economic growth of a country. Entrepreneurswith good entrepreneurial insights are capable of making the economy more productive because they are able to produce goods and services that give consumers satisfaction at a lower cost. Entrepreneurial activity has positive impactsand it contributes directly to employment since entrepreneurship is the equivalent of innovative behaviour of entrepreneurs and risk taking or opportunities search. Entrepreneurship education has been encouraged for the

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purpose of equipping future workforce with the skills required today. Therefore, teaching and learning entrepreneurship is vital, especially in preparing students to face the job market. Entrepreneurial education and training provides individuals with the ability to recognise commercial opportunities, build self-esteem, and acquire knowledge and skills to act on them. Today, schools, colleges and universities cannot escape from incorporating entrepreneurship education in theircurriculaand it must be implementedin all programmes or activities. As pointed out by Phan, Siegel and Wright, more research concerning good ways to train students in entrepreneurship is needed sincesome crucial elements of entrepreneurship at the level of individuals are associated with attitudes, skills and actions, i.e. the elements that are partly not taught in traditional classes. Hence, entrepreneurial treasure hunt game was designed in order to build a learning space that fosters learners'entrepreneurial mind-set through excitement method. The scope of this research is to provide alternative method for learning basic entrepreneurship through games, which can help in creating entrepreneurial mind-set among students. Although the approach of learning has been diversified by using technology, this research offers another alternative approach to learn entrepreneurship skills through a treasure hunt game. It is not only integrating learning through gamesthat make entrepreneurial more fun, it also teaches students how to be good entrepreneurs and help to form and develop the entrepreneurial minds.

2. METHODOLOGY

The research question for this exploratory paper is to inculcatebasic entrepreneurial concepts and foster the entrepreneurial mind-set through hands-on experiences by playing a game. The game would be in the treasure hunt format in which the participants are able to accomplish their goals as a group, aside from having fun and learningmore about entrepreneurship. This game provides a good mix of physical exercises and mental stimulations with some clues testing basic knowledge and skills. The participants get the chance to explore and learn about entrepreneurship concepts, and more importantly, it can help them to develop social skills such as teamwork, problem solving, communication and respect. Feedbacks fromboth the previous participants and literature review are usedas the basesfor the study.

3. RESULTS AND DISCUSSION

Entrepreneurial treasure hunt is a new approach for learning entrepreneurship. The pedagogy focuses on learning and the students are pushed to proactively develop their own understanding rather than waiting for someone to teach them what they need to know. Through this approach, the students are trained to frame problems and find ways to solve them, and then reflect on what they have learned from the games. This approach can been used in practice at different levels; secondary schools and students of higher learning institutions. Entrepreneurial skills include creativity, decision-making, leadership, communication skills, ability to work in a team, marketing, and management, ability to accept failure, flexibility, risk-taking, confidence, and passion. However, only selected attributes relating to entrepreneurial skill elaborated for each of the games were prepareddue to time constrain. The attributes of interest are shownin Figure 1 below.

To begin the treasure hunt game, the participants are given clues that lead them

branding	labelling/ packaging	promoting/ marketing	risk-taking	teamwork	strategy
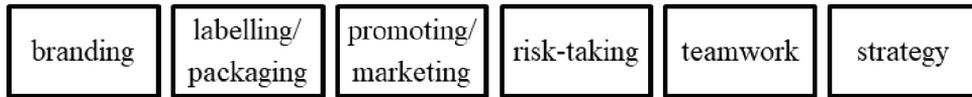
Figure 1: Attributes related to entrepreneurship

from one location to another until they arrive at the final destination. Starting with a single clue, the participants will follow a path of quick decisions, innovation, and money to compete for cash prizes. The lesson learnt is that each detail needs to be analysed carefully and precisely. Teamwork isvery important because all members have to help each other in order to come up with the right answers and reach their destination within the time limit. At every checkpoint, they need to complete a game that tests them on six attributes relating to entrepreneurship (*Figure 1*). That is when the excitement and adrenaline rush began, as the teams need to fulfil all the requirements to win the game.

Thus, treasure hunt game was designed in order to activate a learning cycle where the participants - experience, reflect, think, and act. One of the results that the participants benefit from the game is enjoyment. Enjoyment is often seen as one of the most important reasons to implement games in educationalsetting. Many studies have revealed that students like playing games for educational purposes. By playing a game at every checkpoint, the participants are well prepared to become good entrepreneurs and with the right entrepreneurial mind-set.

4. CONCLUSION

It can be concluded that the entrepreneurial treasure hunt game is one learning tool that is hypothesised to enable students to learn about entrepreneurship in a more fun and exciting way. Nonetheless, the aim of the treasure hunt game goes beyond pure amusement; itcan be a mechanismto reinforce learning in a dynamic, interactive,

motivating and entertaining way. This game has already been used three times using the participants fromthe Centre of Foundation Studies, UniversitiTeknologi MARA. The feedback from the students and instructors is positive. However, this approach is still under development and thus, further research is required. An empirical study among a group of participants of the treasure hunt games during the next Festival Asasiwas planned to take place at the beginning of 2019. As encouraged by Verzatet al., research is also being conducted in the area of games. The research concerns on existing games for each checkpoint, designing creative way to impart information and assessing the suitability of games in order to make sure that it helps to create entrepreneurial minds among students.Therefore, although it is important to attain strong high graduation rates, it is also crucial that the education system teaches students the proper types of skills needed in the twenty-first century such as entrepreneurship and entrepreneurial thinking whichhave been identified as necessary in the ever-changing economy.

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The Rights of Women Victimised in Domestic Violence to Compensation in Malaysia

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A B S T R A C T

The issue of domestic violence against women occurs in countries worldwide and traverses time across races, religions and status. It is a serious issue that is frequently publicised in the mass media. The women's rights to obtain legal protection can be seen in the Domestic Violence Act 1994 (hereinafter "DVA 1994") and the Criminal Procedure Code (hereinafter "CPC") which include the right to compensation. Pursuant to these two laws, compensation not only can be made by a civil court alone, as the criminal court also has a broad jurisdiction to issue a compensation order. This research aims to investigate the right of women victimised in domestic violence (hereinafter "WVDV") to compensation as provided for in the DVA 1994 and the CPC. This paper contains an analysis of the DVA 1994, the CPC, journals and scholarly writings related to this area. This paper concluded that the application for compensation pursuant to the above laws involves court process which can be time consuming and the application depends on the perpetrator's ability to pay. Besides, compensation in criminal cases is often neglected as compared to fine. Thus, in addition to the existing application, compensation fund scheme, which is funded by the government, may be introduced as it represents a more secure means of obtaining compensation, thereby protecting more the wellbeing of WVDV.

Keywords: Domestic violence, women, compensation, court.

1. INTRODUCTION

Domestic violence can be described as "*a broad array of harm against members of a family or intimate unit by other members of such family or intimate unit*" (Meyersfeld, 2008). The right of WVDV to live free from violence is recognised pursuant to the United Nations Convention on the Elimination of All Forms of Discrimination against Women (hereinafter "CEDAW").CEDAW is an international human rights treaty, which was adopted by the United Nations General Assembly on 18 December 1979, to serve as a common international law for eliminating all forms of discrimination against women, which include the context of domestic violence. The objective of this paper is to examine the right of the WVDV to obtain compensation in Malaysia. In general, the WVDV's rights to obtain legal protections can be seen in the DVA 1994,

which include the right to compensation. The right to compensation aims to hold the perpetrators accountable to WVDV for the harm they have caused and recompense for the injury suffered, and the financial expenses incurred such as medical cost and loss of income resulting from the harm. Besides, Viano (1978) pointed out that compensation has the potential integrating the victim more fully into the criminal justice system. It is important to note that the application for compensation, either by way of civil or criminal cases, requires WVDV to go through a court process which may cause hardship to WVDV and depend mainly on the perpetrator's ability to pay. In addition, in a criminal case, compensation is often neglected as opposed to fine and it mainly depends on the Public Prosecutor to apply for compensation on behalf of WVDV.

2. METHODOLOGY

A qualitative approach was used for this research consisting of a detailed analysis of the DVA 1994, the CPC, journals and scholarly writing in this field.

3. RESULTS AND DISCUSSION

Under section 10 (1) of the DVA 1994, WVDV who suffered injury or damage to property or finance may apply to the court for compensation in respect to the injury or damage or loss. A reading of the section indicates that it is more of a civil made application, as described in section 2 of the DVA 1994 which states "*in respect of civil proceedings for compensation under section 10, the court competent to hear such claims in tort*". However, it does not mean that compensation can only be made by a civil court alone, as the criminal court also has a broad jurisdiction to issue a compensation order as provided under section 426 (1A) of the CPC. The differences between two are in terms of the burden of proof and the standard of proof. In civil cases, the burden is on the WVDV to prove her case on a balance of probabilities. Meanwhile, for the criminal case, the burden lies on the Public Prosecutor and the standard of proof required is beyond reasonable doubt.

In criminal cases, there are various forms of financial penalties that can be imposed by criminal courts; these include fines and compensations for the damages suffered. Fines are imposed by the court and are payable to the State. Meanwhile, compensation is also imposed by the court, but it is payable to the victim and not the State. Fine is a more common financial penalty imposed on criminal offenders as compared to compensation (Nasimah Hussin, 2011). Courts may impose fines on the offenders in addition to the sentence of imprisonment or may mete out the sentence of fines alone, depending on the applicable sentencing provision. Thus, if the court is of the view that the imposition of fines alone is sufficient, then a sentence of imprisonment does not need to be passed. In this regard, it can be seen that a fine is a common form of financial penalty expressly available as an alternative to the sentence of imprisonment as stipulated in the sentencing provision itself. Meanwhile, compensation is not incorporated in the sentencing provision as an alternative punishment. Rather, it is a provision provided for under section 426 (1A) of the CPC. In light of the section, the court may make an order of compensation to a victim subject to there being an application made by the Public Prosecutor. Thus, if the Public Prosecutor does not apply for the offender to pay compensation to the victim, the court will not award any payment as compensation. In addition, it is also worth

highlighting that pursuant to section 183A of the CPC, the court shall allow a victim to make a statement on the impact of the offence on the victim before the sentence is passed accordingly. Given the spirit of section 183A of the CPC which allows victims to make a statement on the impact of the offence on the victim, it is proposed that section 426 (1A) of the CPC be expanded to not only allow the Public Prosecutor to make an application for compensation to be paid to WVDV, but also to permit the WVDV to make such an application to court by themselves. Having said the application for compensation pursuant to the above laws involves court process which can be time consuming and contingent upon court decision. Besides the provision also has some ambiguities that may affect the efficiency of its application. For examples, the provision does not explicitly mention the legal implication of the offender who fails to comply the compensation order and lack of guidelines in determining the appropriate compensation that has to be paid to the WVDV particularly involving psychological and emotional harms which are subjective in nature (Wing,2008).

As an alternative to the method detailed above, some countries set up a fund for providing damages to the WVDV. The idea of compensating victims in general is not unusual. A victim's right to compensation has gained traction and has been practiced by other countries. In fact, many nations such as the United Kingdom, Northern Ireland, United States, Canada and Australia have formed non-profit organisations known as the Criminal Injuries Compensation Board (Siti Zubaidah, 2011).At home in Malaysia, however, this idea has not garnered momentum or gained widespread recognition (Siti Zubaidah, 2011).The argument put forward for this method is

that the application for compensation under the scheme is disbursed directly by the government. Hence, statutory compensation schemes are a guaranteed method for victims of domestic violence to receive compensation, and thereby safeguarding more their interests (Freer, 2004).

4. CONCLUSION

It is proposed that section 426 (1A) of the CPC to be amended by allowing the WVDV to make application for compensation by themselves and addressing the legal implication for the offender who fails to comply with the compensation order. Besides, proper guidelines are needed to aid the judge to invoke this particular provision. This is to ensure that the sentence imposed does not only uphold the interest of the public but also adequately address the needs and plight of the WVDV. In addition, it is also worthwhile for the Malaysian government to seriously consider adopting state-funded compensation scheme to effectively protect the interest of WVDV.

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The Correlation Between Brain Dominance and Empathy

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A B S T R A C T

The purpose of this study is to examine the correlation between brain hemispheres and empathy. *Perspective Taking (PT), Fantasy (F), Empathic Concern (EC) and Personal Distress (PD)* have been acknowledged as the subscales of empathy and this study aimed to seek further justification by relating them with the characteristics of the brain hemispheres. There were two sets of questionnaires distributed to 100 students pursuing their undergraduate studies at Universiti Teknologi Mara (UiTM) Selangor campuses. A total of 50 students from each of the Applied Science Faculty and Film, Theatre and Animation Faculty responded to the questionnaires which consisted of a brain dominance questionnaire and an empathy questionnaire. In order to determine the brain dominance of the students, i.e. whether it is left or right brain dominance, they were asked to response to the brain dominance questionnaire. Next, the questionnaire on empathy was also distributed after the grouping of their respective brain dominance had been conducted. Results of this study showed that higher mean scores on the empathy questionnaire were dominated by the students with the right brain dominance as compared to those with the left brain dominance. This study would provide some insights into brain dominance and social interaction skills for future research.

Keywords: Brain hemispheres, empathy, IRI.

1. INTRODUCTION

This study examined the brain dominance of students majoring in Applied Science and Animation at UiTM Selangor campuses. More specifically, this study was conducted to investigate the relationships between brain dominance and empathy. A number of studies conducted in the area of brain dominance have revealed that left-brain and right-brain dominant people are generally linked with different characteristics and features. Most researchers agreed that left-brain dominant individuals are realistic, rational and logical thinkers, while individuals with the right brain dominant are more creative and imaginative. However, some of these previous studies

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on brain dominance have been typically confined their focus to the context or groups of people that have been studied. There are a few research works that examined the relationship between brain dominance and gender, while some shifted their focus on the workplace context and few investigated the clinical participants. Up to the present time, none has explored the connection between brain dominance and empathy. Therefore, this gives the opportunity for this study to find out the relationship between brain dominance and empathy of UiTM Selangor campuses students, namely Applied Science and Animation.

So far, many studies have been conducted on the area of brain dominance and the major activities of the two brain hemispheres (see Humera, 2015; Kumar & Sharma, 2017; Mansour, El-Araby, Pandaan, & Gemeay, 2017; Singh, 2015). According to cognitive neuroscientists, brain dominance or brain hemisphericity happens when an individual is leaning on either left or right hemisphere or even both brain hemispheres during the progression of processing, retaining, digesting different modes of information (Mansour et al., 2017; Singh, 2015; Venkataraman, 1990; Raina, 1984, as cited in Humera, 2015). A study conducted by Mansour et al. (2017) investigated the relationship between brain dominance (both left and right dominance) and empathy. The results of this study revealed that both the left and the right hemispheres give an important role not only towards an individual's social skills but also to the human body. In addition, the study also showed that an individual's understanding and the application of knowledge rely on their brain dominance. This happens due to the reason that people have different brain dominances. Next, a research conducted by Christov-Moore, Simpson, Coudé, Grigaityte, Iacoboni and

Ferrari (2014) aimed to understand the progress of empathy in the brain based on gender differences. The authors pointed out that there are variations in the development of empathy between males and females. Apart from that, the study also revealed that the differences also took part in both the cognitive and affective forms of empathy. Therefore, it can be argued that empathy can be linked with both the left and the right brain hemispheres.

A total of 100 questionnaires were distributed to the students at different UiTM Selangor campuses and data were analysed using Statistical Package of Social Sciences (SPSS). The results of this study revealed that the students with right brain dominance have better empathy skills as compared to the left brain dominance. This can be proven as higher mean scores on the empathy questionnaire was dominated by the Animation students (FITA) who were associated with right brain dominance unlike Applied Science students (FSG) who were presumed to possess left brain dominance.

2. METHODOLOGY

A quantitative method was adopted to collect the data for this study. A total of 100 questionnaires were distributed to UiTM Selangor Campuses students from two faculties, namely, the Faculty of Applied Sciences and the Faculty of Film, Animation and Theatre. 50 students from each faculty were recruited as they were deemed to fulfil the required characteristics. Since they were all in Part 4 and required to choose a major, it was believed that their brain dominance would be different. They were given 45 minutes to answer the questionnaires. There were two adapted questionnaires namely, the brain dominance questionnaire

(Shaw & Hawes, 1998) and the empathy questionnaire (Interpersonal Reactivity Index (IRI). The first questionnaire was to determine the brain dominance comprises two sections with 12 questions, while the second questionnaire consisted of four subscales of empathy, namely *Perspective Taking (PT), Fantasy (F), Empathic Concern (EC) and Personal Distress (PD)*. This empathy questionnaire contained 28 items that were measured on a 5-point Likert scale ranging from 'Does not describe me well' to 'Describes me very well'. In order to analyse data, all the statistical analyses were conducted by implementing Statistical Package of Social Sciences (SPSS) for the questionnaires for brain dominance and empathy, whereas for the brain dominance questionnaire, a one sample T-test was utilised to identify the means of the section. The data were analysed to determine the correlation between brain dominance and empathy, while *Perspective Taking* and *Empathic Concern* subscales from the Interpersonal Reactivity Index (IRI) were analysed and the means were compared to discover the difference in empathy.

3. RESULTS AND DISCUSSION

As explained earlier, the Interpersonal Reactivity Index (IRI), a concept introduced by Davis (1983), was implemented in this paper. It has four subscales namely, *Perspective Taking, Fantasy, Empathic Concern* and *Personal Distress*. However, in this study, the emphasis is only on two subscales, which are *Perspective Taking* and *Empathic Concern*. Separate factor analyses were conducted on the data collected from the Science students (FSG), as well as the Animation students (FITA). The findings on the relationship between brain dominance and empathy will be highlighted by observing each aspect in this section.

From the table above, there are seven questions under the subscale of *Perspective Taking (PT)*. The total mean score for almost every question for the Animation students (M= 2.20, M=1.l8, M=1.02, M= 1.08, M= 1.08, M= 1.54 and M= 1.46) is higher than the mean score for the Applied Science students (M= 1.70, M= 1.12, M=1.00, M= 2.22, M= 1.08, M= 1.48, and M= 0.98). It

Table 1: Mean scores for perspective taking (PT)

	Faculty	N	Mean	Std. Deviation	Std. Error Mean
E3	FSG	50	1.70	1.216	.172
	FITA	50	2.20	1.107	.156
E8	FSG	50	1.12	.799	.113
	FITA	50	1.18	.748	.106
E11	FSG	50	1.00	.857	.121
	FITA	50	1.02	.845	.119
E15	FSG	50	2.22	1.360	.192
	FITA	50	2.20	1.069	.151
E21	FSG	50	1.08	1.175	.166
	FITA	50	1.08	.804	.114
E25	FSG	50	1.48	1.015	.144
	FITA	50	1.54	1.054	.149
E28	FSG	50	.98	.958	.135
	FITA	50	1.46	.908	.128

shows that in terms of PT, the Animation students are more prone than the Applied Science students to spontaneously adopt the emotional viewpoint of others.

For this subscale, once again, the means (M= 1.22, M= 1.72, M=1.32, M= 1.88, M=1.36, M=1.24 & M= 1.18) obtained by the Animation students are higher than the means of the Applied Science students (M= 0.80, M= 1.16, M= 1.12, M= 1.88, M= 0.82, M= 0.92 & M= 0.90), indicating that the Animation students empathised better than the Science students for others' misfortunes.

Based on the data analysed, as expected, most of the mean scores of the Animation students (FITA) for *Perspective Taking (PT)* and *Empathic Concern (EC)* subscales of empathy are higher than the mean scores of the Applied Science students (FSG). By showing the correlation between brain dominance and social empathy skills, these findings can prove the claim made by the theory of left and right brain dominance that the two sides control different types of thinking, particularly in understanding and differentiating social skills, especially empathy, for those who are majoring in Art and Applied Science.

4. CONCLUSION

The aim of this study was to investigate the correlation between brain dominance and empathy. The results revealed that the students of Animation Art (FITA) recorded higher mean scores than students of Applied Science (FSG). Based on the findings, the researchers hope that this study would contribute to the understanding of people in relation to their brain dominance and social interaction skills. Nonetheless, as this study is only confined to one pragmatic aspect, namely empathy, it is essential for future researchers to conduct further study by examining other elements of brain dominance.

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Table 2: Mean Scores for empathic concern (EC)

	Faculty	N	Mean	Std. Deviation	Std. Error Mean
E2	FSG	50	.80	.857	.121
	FITA	50	1.22	.887	.125
E4	FSG	50	1.16	1.076	.152
	FITA	50	1.72	1.144	.162
E9	FSG	50	1.12	1.100	.156
	FITA	50	1.32	.794	.112
E14	FSG	50	1.88	1.380	.195
	FITA	50	1.88	1.003	.142
E18	FSG	50	.82	1.063	.150
	FITA	50	1.36	1.102	.156
E20	FSG	50	.92	1.007	.142
	FITA	50	1.24	.894	.126
E22	FSG	50	.90	.953	.135
	FITA	50	1.18	1.044	.148

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TESL and Mathematics Students' Beliefs of Effective 21st Century Language Pedagogies

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ABSTRACT

The issues of low proficiency in English, poor communication skills, problem solving and critical thinking skills among local graduates (National Graduate Employability Blueprint 2012-2017) have highlighted the need to tap into learners' ability to hone their skills and develop their learning. Using eight selected dimensions of 21st century language pedagogies, this study investigated learners' beliefs of language pedagogies that work effectively for their language development. A descriptive research design comprising of both quantitative and qualitative methods was utilised for data collection from 60 (30 TESL and 30 Mathematics) students at the Faculty of Education, UiTM. Findings revealed that the TESL students had higher overall mean scores (M=4.50, SD=.467) of the effective 21st century language pedagogies belief as compared to the Mathematics students (M=4.04, SD=.374). In addition, the TESL students had the highest mean score (M=5.03, SD=.677) in Dimension 6 (Highlights Learner-centred Models), while the Mathematics students had the highest mean score (M=4.31, SD=.670) in Dimension 4 (Employs Appropriate Tools & Promotes Learning without Borders). Considering the aforementioned findings, it was concluded that the TESL students regard the learner-centred model as the most efficient language pedagogies, while the Mathematics students believe in employing appropriate tools for effective language learning. Another significant highlight of the study was the TESL students' overall mean scores indicated they had higher level of beliefs in most dimensions of the 21st century pedagogies as the effective means for their language learning, while the lower level of beliefs among the Mathematics students advocates the need to use other pedagogies that are suitable for them. Information surfaced from this study is invaluable towards the formulation of classroom practices that are best suited for language learning to take place. Therefore, language practitioners should consider utilising effective 21st century second language pedagogies, as preferred by the students, to ensure successful language development.

Keywords: TESL and mathematics students, 21st century language pedagogies, effective

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language development, undergraduates.

1. INTRODUCTION

This work probed into what TESL and Mathematics students consider as effective pedagogies for their language development. The unsettled issue of low English language proficiency among Malaysian students in general, and among local graduates in specific, highlights the need to look at what students believe as effective for their language acquisition. Identifying what works successfully for their language development will not only support their mastery of the language, but also help them in recognising their own learning strengths (and weaknesses) and developing strategic ways of learning to acquire the much-needed skills to face global challenges (Saavedra & Opfer, 2012, as cited in Scott, 2015).This study was done to investigate the TESL and Mathematics students' beliefs in the 21st century language pedagogies most suitable for them, and to determine any similarity or difference in terms of their preferences for and levels of belief based on the selected dimensions. Such findings are particularly essential for language practitioners in reconsidering language pedagogies and matching classroom activities based on learners' preferences in the effort to attain successful language acquisition.

Although reasons for undergraduates' poor proficiency in English generally vary, numerous works have focused on suggesting relevant educational authorities to revamp the current syllabi at schools and tertiary institutions. Similarly, some researchers have highlighted the fact that local graduates still lack the skills pertinent for high employability (Ibrahim, Kamariah, Nor Hayati & Othman, 2013), including

language proficiency. In fact, the number of years in school and the time spent studying English language, as well as the various efforts by the Ministry of Education at all levels of the school system do not seem to have fully aided in boosting local graduates' mastery of the English language (Fong, Sidhu, & Fook, 2014). Hence, this work was motivated by the need to tap into identifying pedagogies that learners believe to be effective for their language acquisition. Moreover, to the best of the researchers' knowledge, data on learners' beliefs and preferences of effective language pedagogies among undergraduates in different programmes at UiTM are limited.

2. METHODOLOGY

This research was guided by two objectives; firstly, to determine the TESL and Mathematics students' beliefs in what effectively work for their language development based on the 21st century language pedagogies, and secondly, to find out any difference or similarity between the two groups in their level of beliefs in the selected pedagogies based on 8 dimensions of effective 21st century language pedagogies. To extract the necessary data, a mixed-method of quantitative and qualitative design was utilised through a set of self-constructed language pedagogies belief questionnaire, which was based on the contents of '*The Futures of Learning 3: What Kind of Pedagogies for the 21st Century?* (Scott, 2015). It consists of 3 categories; learners' demographic profile, 8 dimensions of effective 21st century language pedagogies, and learners' suggestions of pedagogies that facilitate their language acquisition and MUET results. The 8 dimensions were;

Table 1: The mean scores and overall scores of the effective 21st century language pedagogies beliefs amongst TESL and mathematic students according to dimensions

Dimension (D)		TESL Students		Mathematics Students	
		Mean Score	Standard Deviation	Mean Score	Standard Deviation
1	Customises Learning	4.59	.754	4.13	.588
2	Emphasises Project and Problem-based Learning	4.87	.627	4.25	.567
3	Cultivates Creativity and Innovation	4.44	.751	3.91	.622
4	Employs Appropriate Learning Tools & Promotes Learning without Borders (Strategic questioning, use of mobile technologies & social media)	4.37	.753	4.31	.670
5	Teaches Metacognitive Skills	4.87	.940	4.13	.550
6	Highlights Learner-centred Models	5.03	.677	4.22	.562
7	Recognises Learning through Open Education	3.02	.893	3.06	.862
8	Assesses for Deeper Understanding and Competency	4.65	.580	4.21	.540
	Overall Mean Score	4.50	.467	4.04	.374

*1=Strongly disagree, 2=Disagree, 3=Partially disagree, 4=Partially agree, 5=Agree, 6=Strongly agree

customises learning (D1), emphasises project and problem-based learning (D2), cultivates creativity and innovation (D3), employs appropriate learning tools and promotes learning without borders (strategic questioning, use of mobile technologies and social) (D4), teaches metacognitive skills (D5), highlights learner-centred models (D6), recognises learning through open education (D7), and assesses for deeper understanding and competency (D8). Each dimension comprises between 4 to 6 items, and learners' responses were indicated using Likert scale (1=strongly disagree to 6= strongly agree). A sample of respondents (30 TESL and 30 Mathematics students) was randomly chosen from the population of B. Ed TESL (Hons) programme and B. Ed (Hons) Science (Mathematics) programme at the Faculty of Education, UiTM Puncak Alam, Selangor. At the time of this study, the respondents were undergoing 4-year bachelor degree programmes preparing them for the teaching profession in the future.

The data were analysed using Statistical Package of Social Science (SPSS Statistics 23). The overall mean scores, frequency measures and mean were extracted using descriptive statistics, while the independent sample T-Test was used to yield the significant difference/similarity between the two groups' overall mean scores.

3. RESULTS AND DISCUSSION

This research investigated the language pedagogies that TESL and Mathematics students consider as effective for their language development and determined whether they differ or are similar in terms of their beliefs in effective 21st century language learning pedagogies.

The findings showed that the TESL students attained the highest mean score in D6 (M=5.03, SD=.677), i.e. the pedagogies that highlight learner-centred models, while the lowest mean score for D7 (M=3.02,

SD=0.893), i.e. pedagogies that involve learning through open education. The finding suggests that the TESL students prefer the learner-centred model that focuses on them being actively involved in their own learning as the most efficient way to learn English. This is similar with the work of Caganaga (2014) that found English language learners at the University of Cyprus preferred learner-centred model in classrooms, illustrating the importance of taking into consideration learners' language needs and preferences. Meanwhile, the Mathematics students had the highest mean score in D4 (M=4.31, SD=.670), i.e. the pedagogies that employ appropriate tools and promote learning without borders (e.g., strategic questioning, use of mobile technologies & social media), and the lowest mean score for D7 (Learning through Open Education) (M=3.06, SD=.862). The finding indicates that the Mathematics students believe in using appropriate learning tools and learning without borders as effective pedagogies for them to learn English. These results highlight the need to get language educators equipped with technical and technological skills in order for them to utilise appropriate learning tools and learning without borders approaches in line with learners' pedagogical preferences for language learning.

It is interesting to note that the two groups shared similarity in what they believe as the least effective for their language development, as shown by the lowest mean scores of TESL (M=3.02, SD=0.893) and Mathematics (M=3.06, SD=.862) students for D7. Items for D7 (Learning through Open Education) include blended learning, e-learning, i-Learn, Learning Management System (LMS), and MOOC. The students generally believe that learning through open education is less effective for their language development. The clear disagreement on the use of open education contradicts the finding of Bahri (2016), which reported learners' positive acceptance as it helped them to enhance their English proficiency. The use of certain open education sources at UiTM is still new and they have not been fully implemented. Thus, it can be expected that they display lesser trust and have low expectation in the use of open education modes due to their unfamiliarity with it, or due to the lack of their implementation in their classes. Further improvement must be done to the university's educational platforms so that these can be thoroughly utilised to benefit learners.

However, the two groups significantly differed in their overall mean scores of the 21st century language pedagogies, whereby the TESL students had higher levels of belief in most dimensions (M=4.50, SD=.467), as compared to their Mathematics counterparts (M=4.04, SD=.374) who partially agreed to most dimensions. Their lower level of beliefs in effective language pedagogies suggest language practitioners to consider other relevant dimensions to match learners' preferences and facilitate enhancement of their language proficiency.

4. CONCLUSION

The study sought to determine the 21st century language pedagogies the TESL and Mathematics students believe as effective for their language development, and find out any difference or similarity between the two groups in what they regard as successful for them based on the selected dimensions. This work has highlighted several invaluable insights for language educators to reconsider aligning their teaching methods to what students believe

as effective pedagogies. Information on the pedagogies learners of different programmes believe as effective can serve as guidelines for the implementation of suitable teaching methods, attainment of language skills, and development of other skills that are necessary for their future employability. Generally, the TESL students chose language pedagogies that focus on learner-centred model for learning, while the Mathematics students preferred the use of appropriate tools and promote learning without borders. Language educators can apply the findings in redesigning language practices and reconsidering teaching methods that are more relevant and practical for students of various programmes at UiTM. There are, however, several limitations in this study. The small number of respondents selected from only two programmes (TESL and Mathematics) lower generalisation of the findings to the whole of UiTM student population. In addition, the study only looked at 8 dimensions of the 21st century language pedagogies. Based on the limitations and findings of this study, several recommendations are put forward for future work. Sampling of respondents from other courses (namely, Arts, Biology, Physics, Chemistry & Physical and Health Education) at the Faculty of Education is crucial to attain enriched data pertaining to students' preferences of language pedagogies. Meanwhile, larger and balanced samples taken from various programmes throughout the university can ensure equally distributed data and findings, which can be accurately generalised to the larger population. In addition, it is also important to include respondents from other academic institutions to determine their preferences of the 21st century language pedagogies. Finally, inclusion of more dimensions of the 21st century language pedagogies in future work is also necessary for latest empirical data of studies in contemporary language education, as well as for a greater understanding of what students regard as effective to ensure their attainment of the skills that are pertinent for the ever-changing needs of the industries.

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Integrating ICT in ESL Classroom: A Survey on Teachers' Perceptions in Using Frog VLE for English Lesson

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A B S T R A C T

Information and Communication Technology (ICT) is a medium that can be utilised in English lessons. Frog VLE comes into the picture to enable the use of ICT in Malaysian education system. Hence, this research studied the perception in using Frog VLE in English lessons amongst English language teachers in nine secondary schools in Melaka Tengah district. This study employed quantitative research design whereby questionnaires were distributed to the desired sampling in the selected secondary schools. There were 42 respondents who were English language teachers and it was carried out as an online survey. The instrument was a combination of Likert-scale items and one open-ended question. The quantitative data was analysed using SPSS software whilst the open-ended question was analysed using thematic coding analysis. The results revealed that the English language teachers' level of knowledge is moderately high (M=2.59, SD=0.77). Meanwhile, the teachers' perceptions in terms of Frog VLE usefulness, ease of use, and students' motivation in English lessons were moderate (M=3.44, SD=0.56). In addition, the issues or challenges in Frog VLE integration was also rated moderate (M=2.98, SD=0.74). The suggestions to overcome the issues or challenges were grouped into organisation level, 87% and individual level 6% respectively. To conclude, the study explored the gaps the previous literature did not address which is the integration of Frog VLE in ESL lessons in secondary schools. The suggestions would also be insightful for MOE to develop suitable solutions for the rising issues as the suggestions were proposed by the teachers who were the direct users of Frog VLE.

Keywords: English teachers, frog VLE, ICT, perception, survey

1. INTRODUCTION

Humans have to cope with the rapidly developing world. For the generation of today, it is not a problem for them since they are born with it. ICT has been an integral part in today's era and Budhedeo (2016) asserted that ICT is valuable in education and has a direct role especially in digital literacy. In addition, Ministry of Education (2012) stated in Malaysia Education Blueprint 2013-2025 that the 7th shift is to "leverage ICT to scale up quality of learning across Malaysia" (p. E-28). Various measures have been undertaken by MOE to step up the use of ICT for instance Smart Schools, virtual learning environments, distance and self-paced learning, and video library of best

teaching practices. ICT is too wide that it covers many aspects. It includes software, hardware, media tools, social media networks, internet and the list goes on. This is supported by Melor et al. (2013), as they said that radio, television, computers, Internet, social networks and others, are technologies.

With the growing demand of technological development in Malaysia, many schools are incorporating Frog VLE through the 1BestariNet project. According to Frog Asia (2016), Frog VLE is available to all 10000 schools in Malaysia and it was designed by Frog Education to make teaching simpler and improve teaching and learning, communication, and administration. When it was first introduced, it received a mixed reaction from teachers all over Malaysia. Some agreed with the idea and some felt that it was an additional burden to the existing workload that teachers were facing. Termit and Noorma (2015) supported this and claimed that work load was a probable factor that influenced the teachers' negative perception towards the program. To implement a new idea in a norm really takes time. They further stated that the Frog VLE Project under 1BestariNet was initiated in MOE schools in 2011 but only 351 schools were involved and were categorised as Champion Schools. So, it has been 7 years now after its first introduction but the impact on the learners is not really apparent on how it contributes to the education system. Moreover, schools are provided with computers and high-speed 4G internet connectivity but the implementation of Frog VLE is still questionable. Although Frog VLE is now made compulsory for teachers to use in some schools, there is an issue to use it due to the lack of facilities and a few other limitations.

Currently, a new move by the government has been made to ensure teachers fully use Frog VLE in their lessons by providing school teachers with smartphones. Teachers in Melaka, Kuala Lumpur, and Selangor, for instance, have been equipped with smartphones. Being in the education system themselves, the researchers personally feel that teachers need a lot of guidance to use Frog VLE in lesson. In order to use Frog VLE in a lesson, teachers have to undergo training and do preparation since there are many widgets and updates that teachers need to be familiarised with. GM1M (*Guru Muda 1 Malaysia*) was also created for young teachers to be skilful at using Frog VLE. As supported by Lee (2016), GM1M is aimed to upgrade the skills of young teachers across Malaysia with the Frog VLE, a programme jointly created by the MOE, YTL Communications, and Frog Asia to be used in teaching and learning. However, the problem is the impact of Frog VLE which is still doubted and causes some teachers to ponder whether this is a good move by the ministry. Despite many efforts having been made by MOE and 1BestariNet, it is deemed as a failure by the Public Accounts Committee (PAC). This is supported by Fernando (2016) who said that the project was considered a failure from user-end experience to supplying internet access to schools.

Other than this, the world has changed and so have the learners. Dealing with learners in those days were very much different with millennial learners. They are raised amidst many developments in technology. They are even too exposed to online gaming or spending too much time playing games and this is a major problem with teenagers nowadays. These are unhealthy activities that may destroy their future if not tackled wisely. It is the job of the teachers to turn

technology into a positive tool. We are living in the age of electronic communication and technology and children nowadays are very technologically savvy. Frog VLE is a tool that can make students be fully engaged in learning as Prensky (2001) claimed that the students' thinking is evolving in parallel with modernity. So, it is not surprising that some students are no longer responding to the traditional teaching methods like chalk and talk or rote learning. Learning in a traditional way can also be interactive but not as interactive and engaging as using ICT because students can experience a lot more with it. Hence, if we ignore technology, the learners' future may be at stake and the quality of students' learning will be adversely affected. Teachers should be able

to see what Frog VLE can offer and this research tried to look at their openness to teaching using Frog VLE.

Thus, this study looked into the English language teachers' perceptions on the use of Frog VLE in English lessons and the issues or challenges that contribute to the low usage of Frog VLE. At the end, suggestions to overcome the issues or challenges are provided.

2. LITERATURE REVIEW

Structure within a learning management system: frog VLE

Frog Asia has structured Frog VLE to include school administrators, teachers,
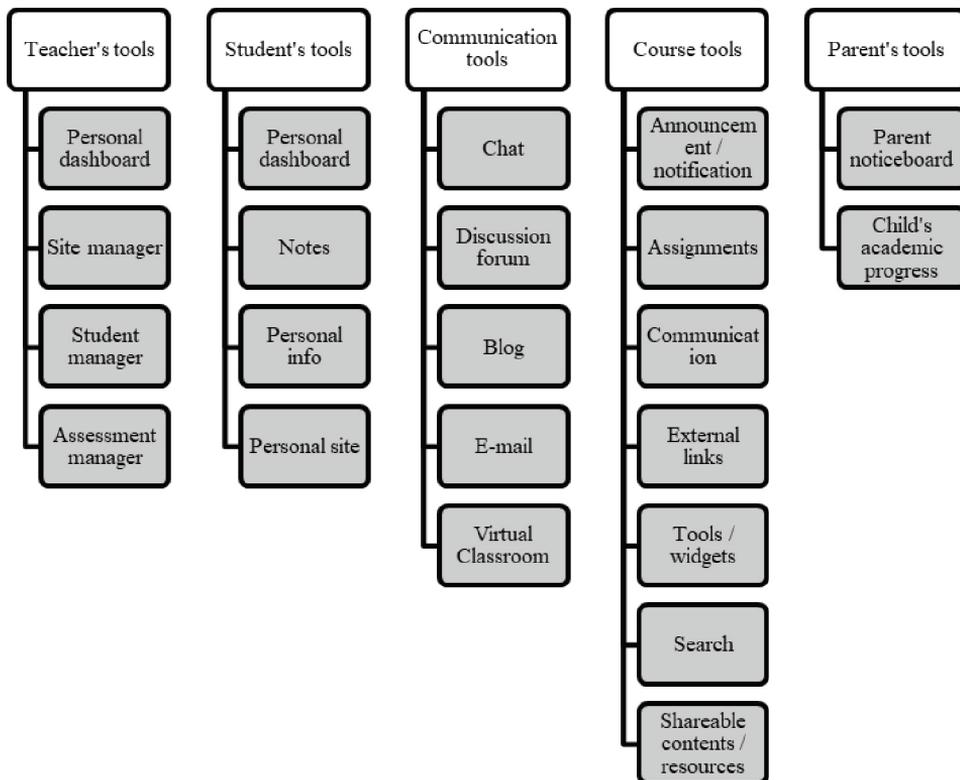
FROG VLE HOMEPAGE

Figure 1: Structure within frog VLE. Adapted from: Khine (2006)

Table 1: Comparison between traditional teaching and frog VLE

Considering Factors	Traditional Teaching Method	Frog VLE
Resources	Resources available within a library or information centre unit. More expensive because searching for it consumes a lot of time.	Learning materials and resources available within the system are less expensive or free, partly because one does not have to pay for the facilities.
Classroom discussion	The teacher usually talks more than the students	The students talk at least as much as or more than the teacher
Scheduling	Requires teacher to attend class a certain number of times every week, at specific times during school days.	User-driven time and learning schedule
Course matter	The teacher conducts the lessons according to the syllabus and existing curriculum	Learning is based on various sources of information such as web data banks and teacher can carry out lessons according to the syllabus and curriculum
Learning process	The learning is conducted with whole class participating	Most of the learning process occurs in groups or individually.
Location of learning	In the classroom, the learning takes place within the school and classroom	Discussion forum, video conference, chat rooms, the learning takes place in no fixed location
Motivation	The student's motivation is low, and subject matter is distant from them	The student's motivation is high, due to their involvement in matters that are related to them and with the use of technology
Interaction	Spontaneous, students can interact with other students	Structured, students can interact with other students and teachers virtually

Adapted from: Abdirahman, Nor Hidayati and Ahmed Hussein (n.d.)

students and parents. The basic features of Frog VLE are as follows (Frog Asia, 2016):

1. Content creation
2. Content management
3. Administration
4. Assessment
5. Reporting
6. Communication
7. Personalised
8. Content
9. Revision
10. Quizzes
11. Portals

As Frog VLE is also a learning management system (LMS), it follows the same structure of LMS but with slight differences. Figure 1 is the structure within a Frog VLE adapted from LMS:

Comparison between traditional teaching and frog VLE

Table 1 shows the comparison between Frog VLE and traditional teaching method. This table was revised for this study to suit Frog VLE platform.

Perceived usefulness and ease of use of frog VLE

Perceived usefulness and ease of use of a technological tool are taken from

Technology Acceptance Model (TAM) by Davis (1989). "Perceived Usefulness (PU) is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived Ease of Use (PEOU) refers to the degree to which a person believes that using a particular system would be free of effort" (Siaw & Agatha, 2015, p. 6). The TAM is an information systems theory that models how users come to accept a technology and how they use that technology. In TAM model, there are two factors that are relevant in computer use behaviours. For this study, it is the Frog VLE use behaviours. According to TAM, ease of use and perceived usefulness are the most important determinants of actual system use.

In this present study, PU helps to explore the English Language teachers' beliefs whether Frog VLE could enhance the job performance. On the other hand, PEOU explores whether the teachers believe that the use of Frog VLE in lesson would make it easy for the teachers and it is free of effort.

Gardner's multiple intelligences theory and the integration of frog VLE in teaching and learning process

Logical/mathematical: Teachers can assign logic-based problems or quizzes and let students complete the task in Frog VLE.

Spatial/visual: Students can answer readily-available quizzes in Frog VLE at their own pace and space. The quizzes include diagrams, colours, arts, and graphs.

Intrapersonal: Students can build their own blog in Frog VLE as each student has a personal site and dashboard. They can treat that as their own personal space to write their thoughts.

Interpersonal: Students can use the forum or chat tools to have a discussion among them on a certain topic. This allows collaborative learning done online.

Bodily-kinaesthetic: Videos and projects can be embedded into Frog VLE platform which allow for the enjoyment of activities that involve movement. Students can do 'scavenger hunts' activity on the web while completing the task in Frog VLE.

Musical: Teachers can share links of videos or music and let students complete the tasks related to the videos or music. Teachers can teach grammar through songs or videos in Frog VLE.

Verbal/linguistic: Teachers can give written assignments in Frog VLE on any topic on any skills; speaking, writing, reading, and listening.

These are only suggestions on activities that are linked to MI and Frog VLE and there are a lot more that can be done. The suggestions are based on Fose's (n.d.) article on exploring technology to address students' multiple intelligence and learning styles. Fisher (2005) suggested that in order to help learners in every lesson, teachers have to focus their attention on an aspect of thinking or intelligence. Indirectly, MI theory in Frog VLE is linked to students' motivation in learning.

Jones (2002) studied on ICT and learning theories. One of the theories he explained in relation to ICT is the multiple intelligence theory. He stated that teachers can develop many activities to enhance students' multiple intelligence by giving them the opportunity to use content-free software like word processors. Kunjal (2015) in another study investigated the role of MI in e-learning and found that students who had different

Table 2: Demographic data of the respondents

Profile	Data	Frequency	Percentage (%)
Gender	Male	11	26.2
	Female	31	73.8
Age Group	20 to 29 years	18	42.9
	30 to 39 years	13	31.0
	40 to 49 years	6	14.3
	50 to 59 years	5	11.9
Years of Teaching Experience	Less than 1 year	3	7.1
	1 to 5 years	15	35.7
	6 to 10 years	12	28.6
	11 to 15 years	4	9.5
	16 to 20 years	1	2.4
	Over 20 years	7	16.7
Type of School	Urban	20	47.6
	Rural	22	52.4
Highest Completed Academic Degree	Bachelor's degree	41	97.6
	Master's degree	1	2.4
Attendance of training course, workshop, or seminar on using Frog VLE	No	8	19.0
	Yes	34	81.0
Experience of computer use	1 to 5 years	5	11.9
	6 to 10 years	11	26.2
	More than 10 years	26	61.9
How long have you been using Frog VLE?	Less than 6 months	4	9.5
	6 months to 1 year	4	9.5
	1 to 3 years	27	64.3
	More than 3 years	7	16.7
	Total	42	100.0

intelligence were required to use an efficient manner of e-learning. Hence, a controlled usage of Frog VLE should be made known to the students so that they know what can help them to enhance learning.

3. RESEARCH QUESTIONS

1. What is the English language teachers' level of knowledge of Frog VLE?
2. What are the English language teachers' perceptions towards the usage of Frog VLE in terms of the usefulness, ease of use, and motivation of students?
3. What are the English language teachers' issues or challenges when using Frog VLE in English lessons?
4. What are the suggestions to overcome the issues or challenges that English language teachers face when using Frog VLE in English lesson?

4. METHODOLOGY

This study used quantitative approach for the researcher to address the research objectives and to assess the findings of the research based on the data collected. However, to get a more enriched data, qualitative data was obtained through one open-ended question on suggestions to overcome issues or challenges, in the questionnaire.

Section A of the instrument focused on demographic profiles of the respondents that are gender, age, years of teaching, type and name of school, highest qualification, Frog VLE training course, experience in computer use, and time of using Frog VLE. In section B, the focus was on the teachers' perceptions in terms of three dimensions that are 1) usefulness, 2) ease of use, and 3) students' motivation when using Frog VLE in English lessons. Section C focused on teachers' level of knowledge of Frog VLE. Section D identified the issues or challenges that the teachers faced when using Frog

Table 3: Level of knowledge of frog VLE dimensions

Dimension	Mean	SD	Level
Creating	2.51	.79	High
Assigning	2.68	.82	High
Using	2.56	.77	High
Overall Level of Knowledge of Frog VLE	2.59	.77	High

Table 4: Perception of frog VLE dimensions

Dimension	Mean	SD	Level
Usefulness	3.53	.62	High
Ease of Use	3.40	.54	Moderate
Students' Motivation	3.40	.64	Moderate
Overall Perception	3.44	.56	Moderate

VLE. Finally, section E was an open-ended question requesting for suggestions on ways to solve the issues or challenges identified in section D.

5. RESULTS AND DISCUSSION

Section A: Demographic data of the respondents

RQ1: What is the english language teachers' level of knowledge of frog VLE?

It was found that the overall teachers' level of knowledge of Frog VLE was moderately high (M=2.59, SD=0.77). This was due to the high mean range scale $2.50 \leq 2.59 \leq 4.00$. The findings from this section in Table 3 revealed that the English language teachers had the lowest level of knowledge in creating, M=2.51 and SD=0.79. The teachers had the highest level of knowledge in assigning, M=2.68 and SD=0.82.

81% of the respondents had attended training course and 64.3% of them had 1 to 3 years of experience using Frog VLE. However, findings indicated that despite having 1 to 3 years of experience, it was apparent that the teachers in this study did not have very high competence level which they should have acquired after years of using it. They were only good at using certain tools or resources and this was supported by Rosnaini and Mohd Arif (2010, as cited in Moganashwari & Parilah, 2013) that only a small number of teachers were very good in ICT. Thus, this was likewise to this study. This could be due to the constraints in terms of the teachers' perceptions and issues or challenges of Frog VLE which would be discussed in the subsequent sections.

RQ2: What are the english language teachers' perceptions towards the usage of frog VLE in terms of its usefulness, its ease of use, and motivating students?

The quantitative findings in Table 4 revealed that the teachers had high level of perception in Frog VLE usefulness compared to the ease of use and students' motivation with the mean score of 3.53 (SD=0.62). This finding seemed to be aligned with Ghavifekr and Ibrahim (2015) that most teachers were aware that ICT was very useful to improve teaching. On the other hand, ease of use and students' motivation obtained the same mean score 3.40 (SD=0.54 and 0.64) respectively. The teachers seemed to have moderate perception of Frog VLE in its ease of use and students' motivation.

RQ3: What are the english language teachers' issues or challenges when using frog VLE in english lesson?

The findings highlighted that the teachers

Table 5: Overall mean score of items in issues or challenges in frog VLE

No.	Dimension and Item	Mean	SD	Level
	Dimension 1: First-Order Issues			
8.	There is internet instability and reduced speed connectivity at school	3.60	1.01	High
4.	There is a lack of facilities at schools. E.g.: Chrome books and computers	3.48	1.13	Moderate
5.	There is a lack of technical support	3.48	1.02	Moderate
7.	There are flaws/instability of servers of Frog VLE	3.38	1.08	Moderate
9.	There is lack of maintenance on Frog VLE from YTL communication	3.33	1.00	Moderate
6.	There is a lack of ready-to-use contents and good practices examples of Frog VLE	3.17	1.15	Moderate
3.	There is insufficient covering of Wireless internet connection at home	3.14	1.28	Moderate
10.	I do not get enough training to be skilled in using Frog VLE	3.14	1.03	Moderate
2.	I do not have Internet access at home.	2.12	1.04	Low
1.	I do not have a computer at home that I can use.	1.93	.75	Low
	Overall First-Order Issues Score	3.08	.70	Moderate
	Dimension 2: Second-Order Issues			
11.	I have limited knowledge on how to make full use of Frog VLE	3.05	.96	Moderate
15.	It is difficult to manage Frog VLE	3.00	1.15	Moderate
13.	I do not have time during school hours to use Frog VLE	2.95	1.23	Moderate
14.	I have limited understanding on how to integrate Frog VLE into teaching	2.86	1.12	Moderate
12.	Frog VLE is too hard and complicated to use.	2.52	.92	Moderate
	Overall Second-Order Issues Score	2.88	.88	Moderate

Table 6: Suggestions to overcome issues or challenges of frog VLE

No.	Dimension and Item	Frequency	Percentage (%)
	Organisational Level		
1.	Give more training, support and resources (eg: module of Frog VLE)	12	30
2.	Provide a stable server for the site to run smoothly	11	27.5
3.	Supply enough computers at school (eg: netbooks, Chromebook, PC)	7	17.5
4.	Revert to traditional teaching	2	5
5.	Provide conducive environment	2	5
6.	Update and simplify Frog VLE interface	2	5
7.	Provide smartphone or Tab for students	2	5
8.	Make Frog VLE more accessible on the phone	1	2.5
9.	Vary materials in Frog VLE related to the curriculum	1	2.5
	Overall Organisational Level Total	40	100.0
	Individual Level		
1.	Learn and identify other ways to accept Frog VLE system	2	33.3
2.	Search for information of Frog VLE in Google	1	16.7
3.	Make extra time to learn and use in class	1	16.7
4.	Add more out of school time exposure of Frog VLE	1	16.7
5.	Improve computer skills	1	16.7
	Overall Individual Level Total	6	100.0

had the highest level of issue in the First-Order Issues (M=3.08, SD=0.70) compared to Second-Order Issues (M=2.88, SD=0.88) (refer to Table 5). First-order issues were identified as the external factors of Frog VLE like limited access to computer, lack of training, and technical support. Meanwhile, second-order issues were identified as internal factors within an individual like teachers' knowledge, attitude, beliefs, and perception. Hence, the findings showed that the teachers had the highest level of issues with the external factors; first-order issues or challenges.

This finding was paralleled to a study conducted by Siti Nazuar (2014) who revealed that the lack of technological facilities was the main reason teachers did not integrate technology. Arumugam and Abdul Halim (2013) also attained the same results that teachers agreed that the obstacles were mainly lack of technical support, lack of professional development on how to integrate technology, lack of funding, and lack of time.

RQ4: What are the suggestions to overcome the issues or challenges that english language teachers face when using frog VLE in english lesson?

Findings in Table 6 show that suggestions were proposed more at the organisational level than the individual level with the total frequency of 40 and the percentage of 87%. Meanwhile, the suggestions for the individual level had the frequency of six and the percentage of 13%.

6. CONCLUSION

Frog VLE has the advantages to improve and transform teaching and learning in the classroom. Khine (2006) asserted that it gives "flexibility for both teacher and student" (p. 183). She then affirmed that it has a "plethora of tools that are built in the system" and will provide a dynamic learning environment with ample support to make sure learning objectives are achieved. Using ICT in education is a methodology that is seen as a need in the global world today. Nonetheless, in order to achieve the maximum usage of Frog VLE in English lessons, support and contributions are needed from MOE to teachers.

Based on the responses given by the respondents, majority of them viewed Frog VLE positively and agreed that it is useful in students' learning even though a lot of improvements have to be carried out by the MOE, State Education Department (JPN), and schools since majority of the challenges are in terms of first-order issues like limited access to computer and internet and lack of training which ultimately impact the use of Frog VLE amongst the teachers. Thus it is hoped, the results from this study could contribute to the betterment of Malaysian education system, regarding Frog VLE integration in the teaching of English language amongst school teachers in Malaysia.

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Citation Quotation Parameter

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A B S T R A C T

Academic writing is a must have knowledge for undergraduates regardless of the field. It is a window for others to know the undergraduates' thoughts and ability in the academic sphere. Knowing how to write academically portrays the undergraduates' skills in thinking critically, working professionally and researching ethically. It is therefore eminent for the undergraduates to learn the most effective way to write academically. There are many elements in academic writing and one of them is writing citations. The undergraduates have to master the writing of two types of citation: in-text citation (quotation, paraphrase and synthesis) and end-text citation (references, bibliography). Non-compliance to the format of citation will result in the probability of higher plagiarism rate. The detection is via the undergraduates' assignments, project papers and presentations. This paper, therefore, is to look into in-text citations, focusing on quotations by providing a citation quotation parameter. It covers a few themes, namely: the type of quotes, reasons to quote, how to quote, ways to quote and making changes to quote. These themes are presented on an informative pamphlet entitled "Citation Quotation Parameter".

Keywords: Academic writing, citations, quotations, undergraduates, education.

1. INTRODUCTION

Undergraduates' lives are full of writing assignments and doing presentations. The format for the work should be academic and thus warrants for the inclusion of citations – in-text as well as end-text. This requires knowledge and understanding on how to put the knowledge into practice. Thus, this paper is addressing the transition of knowledge on in-text citation, specifically the quotation to practice by introducing the "Citation Quotation Parameter". This is a part of a larger research with a grant from Universiti Teknologi MARA (600-IRMI/DANA 5/3/ARAS (0059/2016).

2. LITERATURE REVIEW

This section discusses related literature on the issues of parameters. There is a need to explain that the synonyms of the word parameter such as 'guidelines', 'policies' and 'standard' are used in the search for related articles. This is because the search for only "parameter" have produced a limited result, either online or print. Therefore, these words in "…" are used interchangeably in this article. The discussion of the literature review is to focus on two issue – the benefits and limitations of parameter.

Power (2017) listed eight benefits of having policies at the workplace. The eight items

Table 1: Benefits of policies (Power's, 2017)

1	They help employees know what is expected of them with respect to standards of behaviour and performance
2	They set rules and guidelines for decision-making in routine situations so that employees and managers do not need to continually ask senior managers what to do.
3	They help you to adopt a consistent and clear response across the company to continually refer to situations involving employee interaction
4	They allow you to demonstrate good faith that employees will be treated fairly and equally.
5	They allow you to have an accepted method of dealing with complaints and misunderstandings in place to help avoid favouritism
6	They set a framework for delegation of decision-making.
7	They give you a means of communicating information to new employees
8	They offer you protection from breaches of employment legislation, such as equal opportunity laws

are listed in Table 1.

The National Council of Teachers of English (1996, p. 2) presents the three core beliefs of "Standards for the English Language Arts" which are:

• First, we believe that standards are needed to prepare students for the literacy requirements of the future as well as the present. Changes in technology and society have altered and will continue to alter the ways in which we use language to communicate and think. Students must be prepared to meet these demands.

• Second, we believe that standards can articulate a shared vision of what the nation's teachers, literacy researchers, teacher educators, parents and others expect students to attain in the English language arts, and what we can do to ensure this vision is realized.

• Third, we believe that standards are necessary to promote high educational expectations for all students and to bridge the documented disparities that exist in educational opportunities,. Standards can help us to ensure that all students become informed citizens and participate fully in society.

The reviewed articles strengthened the need to establish a parameter for undergraduates.

Nonetheless, there is also the need to consider the limitations of a parameter. The three limitations of a parameter is linked to the issues of it being self explanatory, comprehensive and troublesome. To the first issue of self explanatory, it is defined as "easily understood from the information already given and not needing further explanation" (Cambridge Dictionary (online) retrieved on 3.5.2018). Furthermore, self explanatory of any document have to be clear, precise and informative. Readers of the parameter have to be able to read and comprehend the content without receiving further help or guidance. The second limitation is the issue of comprehensiveness ("to reflect the facts of seeing each part as a function of the whole, of not isolating a particular aspect from its context"). National Information Standard Organization (NISO) in its guidelines suggested that comprehensiveness is related to three main elements – exhaustivity, specificity and depth of indexing. Exhaustivity is related to "1. the extend to which concepts and topics are made to be retrievable 2. Are all the topics, concept, people and events in the index, and thus findable?" while specificity is "the extent to which a concept or topic … is identified by a precise term. Are all the topics, concept, people and events in the index findable by precise terminology?". Meanwhile, the depth of indexing is to address the level of (low or high) indexing done in the work.

The third limitation of a parameter is that it could appear troublesome. Perkins's (1999 in Meyer& Land, 2003, p. 5) defined troublesome knowledge as "that which appears counter-intuitive, alien (emanating from another culture or discourse), or incoherent (discrete aspects are unproblematic but there is no organising principles)."

The review of literature in this section is to form the basis on the development of the citation quotation parameter. The benefits and limitations of a parameter is thought through carefully, with due considerations from multiple perspectives.

3.   CITATION   QUOTATION PARAMETER TRIFOLD PAMPHLET

The parameter for citation quotation is presented in the form of a trifold pamphlet as shown below.

4. CONCLUSION

The "Citation Quotations Parameter" is hoped to render assistance to undergraduates and postgraduates alike in their academic endeavour. The plan is for the parameter to be more comprehensive and to onset empirical researches, looking into its use among students, undergraduates and postgraduates. To close the gap between knowledge and practice, a citation quotation course is in the radar.

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Utilizing Service Learning to Nurture Youth Philanthropy: The Humanity Paladins Initiative

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A B S T R A C T

The *Humanity Paladins* is a Youth Philanthropy service learning initiative in Centre of Foundation Studies, UiTM, Dengkil, that engages young people in social change, with a special focus on the Orang Asli community. It integrates community service across several UiTM foundation programs with tailored instructions and reflections, aimed to enrich and diversify students' learning experiences. This paper shares the experiences and findings of the one-year service learning outreach project with SK Bukit Tampoi (A), Dengkil, a school for Orang Asli children. The opportunity to collaborate in creative development of learning aids for children with learning disabilities and hands-on experience of teaching the disadvantaged were life changing experiences. The youths who participated in *The Humanity Paladins* project underwent changes in thinking, increased self-confidence and better awareness of poverty and marginalized communities. The act of giving and being kind to others is the legacy we strive to instil in our students, a characteristic required in individuals who will lead the world. We hope this project has nurtured lifelong philanthropists who will give their time, creativity and talent towards a sustainable future.

Keywords: Service learning, philanthropy, youths.

1. INTRODUCTION

Service learning is a powerful form of experiential learning which occurs through a cycle of action and reflection as students 'live' what they are learning to address real community needs. It has been identified as one of the key strategies in Malaysia Education Blueprint 2015-2025. This paper highlights a service learning initiative conducted by students of Universiti Teknologi MARA, Dengkil campus for the Orang Asli community of Dengkil, Selangor and discusses the multiple benefits that it wields. The initiative was given national recognition and presented at the *Seminar Amalan Terbaik Sekolah Asli Peringkat Kebangsaan* 2017 organized by the Selangor State Education Department.

2. SERVICE LEARNING PROJECTS AT SK BUKIT TAMPOI (A), DENGKIL

Under the flagship of Centre of Foundation Studies, UiTM, *Humanity Paladins* undertook two service learning – youth philan-

thropy projects for the Orang Asli community of Dengkil; the *Khidmat Bantu* LINUS 2.0 Project and *Seronoknya Sekolah*! The student-initiated missions were executed in collaboration with the Foundation in TESL Department of Centre of Foundation Studies, UiTM and mobilized 60 students from 2 different cohorts with experienced academicians. It aimed at improving Orang Asli children's literacy level, nurturing motivation and interest in reading, and heightening school attendance rates. It also provided an opportunity for the university to embark on Corporate Social Responsibility (CSR) projects targeted on under-developed community (the Orang Asli) while expanding its wings on public advocacy and community engagement.

3. RATIONALE FOR CONDUCTING YOUTH PHILANTHROPIC WORK FOR THE ORANG ASLI COMMUNITY

Although access to primary level education is increasing year by year, academic achievement among the Orang Asli community has not shown significant improvement. According to the Malaysian Education Development Plan 2013-2025 Year 2016 Report, the average UPSR passing rate of students from the Orang Asli schools declined from 45.6% in 2015 to 43.8% in 2016. There is a huge gap to fill when compared with the national passing rate at 84.9% in 2015 and 86.5% in 2016 respectively, which reflects their low literacy and numeracy skills acquisition rates in school. In 2016, only 30% of Orang Asli UPSR candidates nationwide passed the Bahasa Melayu (Comprehension) paper while a meagre 29% passed the Bahasa Melayu (Composition) paper. The figures are more devastating with the English (Comprehension) paper which stood at 9% passing rate while English (Compo-

sition) recorded only 5%.

SK Bukit Tampoi which was established in 1960 caters for 169 Primary 1 to Primary 6 students of Orang Asli from the Semai tribe, living sporadically in seven different villages in the Sepang district, Selangor. With only 18 teachers and 3 support staff, the school struggles to meet the academic needs of its students, while trying their best to implement other miscellaneous programs and initiatives introduced by the Ministry of Education namely LINUS 2.0 and extra-curricular programs in each school term. Similar to other Orang Asli schools in Malaysia, the school faces challenges in ensuring the students attend school 5 days a week despite the geographical boundaries from their different villages to school, and other notably similar challenges among the aboriginal communities worldwide, namely low cognitive ability (Kranzler & Floyd, 2013), weak motivation, family awareness and background (Haak et. al, 2012) as well as psychological support (Macfarlane, 2012).

4. PROJECT DESCRIPTION: *KHIDMAT BANTU* LINUS 2.0

Orang Asli students' literacy is listed as part of the national educational agenda, as reflected in the National Key Results Areas (NKRA) on Education 2010 and National Education Development Plan 2013-2015. The main aim *Khidmat Bantu* LINUS 2.0 project was to assist Orang Asli students from seven different villages studying at SK Bukit Tampoi (A) Dengkil, by providing volunteer reading-facilitators and partners. Below is the project summary:

From January to March 2017, the volunteers travelled from campus, sacrificing their lunch hour in between classes to be

Table 1: Khidmat bantu LINUS 2.0 project summary

No.	Item	Detail
1.	No. of student volunteers	30
2.	Programs involved	Foundation in TESL, Foundation in Science, Foundation in Law, Foundation in Engineering
3.	No. of Orang Asli pupils	20
4.	Concept	Mentor-mentee basic literacy session
5.	Duration	1 hour per session January – March 2017
6.	Total number of sessions	12

Table 2: *SeronoknyaSekolah*! project summary

No.	Item	Detail
1.	No. of student volunteers	30
2.	Programmes involved	Foundation in TESL, Foundation in Science, Foundation in Law, Foundation in Engineering
3.	No. of Orang Asli pupils	20
4.	Concept	Fun learning through language games, art & craft and music
5.	Duration	30 minutes per session July– August 2017
6.	Total number of sessions	12
7.	Activities Conducted	• 25th July 2017 Mini Concert Baby Shark Musical Chair • 26th July 2017 : Mini Concert "Kalau Rasa Gembira" • 27th July 2017 : Mini Concert 2 and Radio Rosak game • 1th August 2017 : Arts & Crafts – Making Animal Paper Mask • 2th August 2017 : Psychomotor Game – Animal Charades • 3rd August 2017 : Cognitive Game - Animal Jigsaw Puzzle • 8th August 2017 : Psychomotor Game – Mega Snakes & Ladders • 9th August 2017 : Arts & Crafts – Making Animal Collage • 10th August 2017 : Arts & Crafts – Making Animal Origami • 15th August 2017 : Arts & Crafts – Making Streamer Rainbows • 16th August 2017 : Arts & Crafts – Fingerprint Painting • 17th August 2017 : Psychomotor Game – Catch Me If You Can

with the Orang Asli children as they assist the children in identifying and memorizing alphabets, forming short words from combined syllables and reading storybooks to boost learning and reading motivation.

5. PROJECT DESCRIPTION: *SERONOKNYA SEKOLAH*!

Seronoknya Sekolah! was the second project carried out at SK Bukit Tampoi (A), designed as a follow up to *Khidmat Bantu* LINUS 2.0. The project was launched to boost and sustain students' motivation to attend school while giving a fresh, fun and enticing image to the school environment. It revolutionized the learning environment for Orang Asli students by introducing fun language games, creative and colourful art and craft sessions and music into the classroom. Below is the project summary:

6. FINDINGS AND SUGGESTIONS

The participants from both philanthropic projects (n=60) were asked to respond to a survey regarding the impact of the initiative and how it helped them. Table 3 below depicts the survey results:

7. CONCLUSION

In conclusion, numerous meaningful benefits can be reaped by developing philanthropy among Muslim youths via service learning. Exemplary youth philanthropy projects can be replicated elsewhere and serve as critical reference point for other entities to

Table 3: Survey results

Feel more committed to help the society	89%
Feel more appreciative of what I have in life	83%
Learn how to make better decisions	95%
Increase self-confidence	88%
Become better at planning and facilitating programs	82%
Develop skills of crowd-funding	76%
Feel more comfortable in a leadership role	79%
Increase awareness of issues of communities around me	89%
Develop positive relationships with other people	87%
Strengthen my volunteerism spirit	89%

emulate. The concept of youth philanthropy promotes a cultural shift, away from viewing youths from a deficit perspective, to a culture of viewing youths as assets to the community and society as a whole (Norshiha, 2013) Besides that, youth philanthropy projects enable youths to hone their creative and critical thinking, problem solving and public speaking competency while perfecting their synergy when working in teams. They also enable youths to be innovative and creative in generating revenues and crowd-funding to run humanitarian projects without relying too much on university funding. In addition, these projects heighten the sense of gratitude, self-efficacy and appreciation of youths towards themselves and other people, therefore forging a more solid sense of community entitlement and belonging.

In response to the fast-changing world landscape, universities should act fast in future-proofing graduates not only by preparing them with employability qualities but also with Islamic and global attributes via service learning initiatives towards a more sustainable future.

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Discriminatory Treatment Against Migrant Workers on the Right of Social Security

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A B S T R A C T

Malaysia is highly dependent on migrant workers to develop the nation, particularly in terms of development and infrastructure. Malaysia is indexed as one of the countries that rely heavily on migrant workers from Bangladesh, Vietnam, Myanmar, Nepal, and Indonesia, which has resulted in the increased occurrences of discrimination. The initial finding shows that migrant workers in Malaysia face discriminatory treatment primarily due to insufficient legal coverage under the existing laws. This paper argues that this issue can only be addressed by providing migrant workers with greater protection in the aspect of social security. Using the qualitative research methodology, this study analyses the coverage and protection given under existing laws to migrant workers, which would ensure basic social and labour protection. This study will further explore the potential effects of social security at domestic level that could address this problem, in compliance with the International Human Rights Law and International Labour Standards.

Keywords: Migrant workers, discriminatory treatment, right to social security, malaysian labour law, international labour law.

1. INTRODUCTION

The International Labour Organization (ILO) defines a migrant worker as a person who migrates from one country to another with the view of being employed. This definition also includes any person who is commonly admitted as a migrant for employment. It is commonly known that migrant workers are one of the key factors that have greatly contributed to the regional social and economic development in Southeast Asian countries, particularly in Malaysia. The objective of this paper is to analyse the position of migrant workers in Malaysia focusing on their right to social security by looking at the protection and treatment provided by the Government of Malaysia. The research shows that majority of migrant workers are economically weak, politically powerless, and socially marginalised (Zheng, 2016). They often

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come to the host countries where they perform jobs that the natives no longer want to do, the so-called 'three-D' jobs (dirty, degrading, and dangerous). These migrant workers are among the most vulnerable people in society. They are the least protected group, who may have been victimised in the form of abuse, as well as exploitative and discriminatory treatments (Abella, 2002). Therefore, migrant workers need to have their rights spatially and temporally protected, in the long transition process and at different locations before their final resettlement (Zhu & Lin, 2013). Malaysia, as a foreign worker-employing nation, has taken various approaches to avoid seeing employed foreign workers in allowed-industries as a national security issue. This explains the country's strict policies to address the influx of foreign workers. These policies are manifested in its law formations and amendments pertaining foreign labour employment, especially with regards to Article 22 of the Universal Declaration of Human Rights (UDHR) 1948, in conjunction with the right to social security for legally employed foreign workers.

2. METHODOLOGY

A qualitative approach was employed in this research to discuss the real position of migrant workers, who face discrimination by the Government of Malaysia and to offer recommendations to address this problem.

3. RESULTS AND DISCUSSION

The Social Security Organisation (SOCSO) was formed under the Employees' Social Security Act 1969 (ESSA 1969). The main responsibility of SOCSO is to administer two social security schemes, namely, the Employment Injury Scheme (EIS) and the Invalidity Scheme. EIS provides coverage and protection for employees who suffer from employment injury. Tracing back to the early years of its operation, ESSA 1969 did apply to migrant workers. However, with the huge influx of foreign workers, problems began to emerge (Ragayah, Hwok, & Saaidah, 2002). As a result, in 1993, all foreign workers were excluded from coverage under the ESSA 1969, with effect from 1 April 1993 (SOCSO, 2017). Alternatively, protection for injury suffered by migrant workers in the course of their employment is now covered by the Workmen's Compensation Act 1952. Pursuant to this section, all employers are required to ensure that their migrant workers are insured under the Foreign Worker Compensation Scheme with any insurers appointed by the Ministry of Human Resources (Department of Labour of Peninsular Malaysia, 2013). Through this insurance, the insurer will pay the compensation for any injuries sustained by the migrant workers in the course of their employment. The introduction of the Workmen's Compensation Act 1952 shows that the Act aims to provide payment of compensation to workmen for any injury suffered in the course of their employment. The Act recognises the protection offered by social security for a migrant who works and unfortunately, suffers an injury at his workplace in Malaysia. In a recent 2015 High Court case, Alamgir illustrated one of the weaknesses in the Workmen's Compensation Act 1952 whereby the Judge in this case commented that the compensation was too low and unable to meet the present economic demand.

Next is the Employment Act 1955. The Act applies only in Peninsular Malaysia. Meanwhile, Sabah and Sarawak are regulated by their respective laws, namely,

the Sabah Labour Ordinance 1967 and the Sarawak Labour Ordinance 1952. They provide several protections that fall under social security extending to migrant workers. Despite the existence of a legal framework in Malaysia, as previously discussed, one case illustrated that the rights of a migrant worker were being disregarded by the employer. The Chin Well case shows that despite having a legal framework, the biggest problem in Malaysia is that some employers would ignore and break the laws concerning foreign workers, even though they are aware of the legal obligations in the contract of employment. Hence, there is a lack in terms of law enforcement, where the employers would blatantly violate the employment contract and the law because they feel that there are no consequences in doing so. All workers should be treated with fairness, dignity, and equality without distinction, whether they are locals or migrants. Migrant workers are entitled to the same employment rights and benefits enjoyed by the local workers (Iruthayaraj & Pappusamy, 2014).

Migrant workers are being discriminated against their right to social security due to inadequate and insufficient legal protection. Migrant workers should have the rights to the nine branches of social security, as previously discussed. Thus, the Malaysian government should consider ratifying several of the international conventions related to Social Security, such as the (C118) Equality of Treatment by the International Labour Organization (ILO). By ratifying this convention, new legislations could be enacted at the domestic level to ensure the elimination of any form of discrimination against migrant workers as well as to protect their right to social security. The government should also strive to meet the minimum standards of two main conventions adopted

by the ILO as international labour standards, namely, the Social Security (Minimum Standards) Convention, 1952 (No. 102) and the Equality of Treatment (Social Security) Convention, 1962 (No. 118), which are related to the social security of migrant workers.

4. CONCLUSION

The Malaysian government holds the stand that it is not feasible to include migrant workers under social security schemes. Malaysia is a renowned nation with high domestic standards in its compliance with legislations in the international obligation to the ILO Fundamental Convention on labour standards. Therefore, the application and practice of domestic laws in Malaysia should not discriminate migrant workers by excluding them from legal coverage and legal protection in places where they are in need as employees. Another way to deal with discrimination practices against migrant workers is by looking at their great contributions in providing manpower in the host country, particularly when their contributions have resulted in the development of infrastructure in Malaysia.

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An Overview of Pornographic Activities among Malaysian Citizens

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A B S T R A C T

Pornography has become one of the fastest rising forms of modern cybercrime. It is becoming increasingly vibrant among Malaysian Communities. Sin Chew Daily reported on January 30, 2018 that Malaysia has the highest number of IP addresses in uploading and downloading photographs and visuals of child pornography in South-East Asia. The data furnished by Dutch Police based in Malaysia in 2015 found that 17338IP addresses involved in child pornography were from Malaysia. Pornography is easily spread among young people specifically students. If it is not properly handled throughout the practices of religious and moral education, it will become a hindrance to the building of a civilized society. Therefore, this paper is carried out to review the factors that lead the community into pornographic activity. It will identify the factors of pornography activities among Muslims and characterize the level of their awareness of pornography cybercrime with respect to the practices of fundamental Islamic knowledge and moral values. This research will be implemented by using library research and interviews among a few Malaysian citizens. It must answer the questions to identify the factors of pornography activities among Muslim community and how religious knowledge relates to the awareness of pornography cybercrime among them. It is expected that this paper will provide basic information for educators to instill the awareness among students and professionals regarding the pornographic activities threats and react to avoid it. Hopefully, this research will contribute in restructuring the skills and methods to enhance future Islamic Studies.

Keywords: Pornograhy, students, gadget, activity, factor.

1. INTRODUCTION

Pornography visuals are getting easier to be accessed with the evolution of mobiles and apps technologies, especially by youngsters. These young people are easily exposed to the internet and cyber world. They share videos, visuals and pornographies freely without feeling guilty. The activities are being done on a regular basis, regardless of laws and regulations that have been enacted by the government.

It was reported that Malaysia has reached

the highest usage of IP addresses involved in child pornography (Sin Chew Daily, 2018). This article clearly demonstrates the problem of our community that involves pornographic activities. It supports the need for this research to be done. Therefore, this study is very significant to find out the problem factors and propose the solutions.

2. METHODOLOGY

This paper is a conceptual review paper. It consists of two research questions which is to identify the factors of pornography activities among Muslims and characterize the level of their awareness of pornography cybercrime with respect to the practices of fundamental Islamic knowledge and moral values. It is handled by using qualitative study methods. A few interviews have been conducted as a preliminary approach to the community. The scope to be evaluated in the research instruments are the factors that trigger their involvement in pornographic activities and the awareness of the negative effects of pornography.

3. RESULTS AND DISCUSSION

Suzana et.al in a proceeding paper of the Malaysian Technical Universities Conference on Engineering and Technology (MUCET) (Suzana Sulaiman, Ku Amir Ku Daud, Nor Suhaila & Che Pam, 20 Nov 2012) used qualitative method in their study. The two main objectives highlighted in the study were the reason of increasing number of female victims in cybercrime and the solution and precautionary measures to decrease the number of cybercrime involving female victims in Malaysia. This article concludes the lack of knowledge and awareness on the security of computer and mobile phone use caused many Malaysians being cheated by the cybercrime syndicates

as well as the excitement to get as many friends as possible on social media sites. This article support and help the researcher to build up the questionnaire and find out the factors of pornographic activities. Even though, the scope of the article is not focused on Muslim Students.

The researcher referred to a study carried out by Asiah Bidin et.al (2015) to identify the most famous social networking sites among students. They identified a survey conducted by Social Networking Watch (2010) which showed 85% of respondents in Malaysia used social websites followed by India (83%), Singapore (82%) and the United States (75%). According to Syahrir and Fatin (2012), sources from Alexa and Google Ad Planner showed a total of 6.2 million Internet users in Malaysia visited Facebook social sites, followed by Friendster (4.2 million), MySpace (2.1 million) and Twitter (750 thousand). The number is quite high, thus the negative impacts should not be underestimated. This article concludes that the use of social networking sites gives the risk of cyber stalking. An analysis on the legislative framework in relation to the crime shows that there is lacuna in legal provisions pertaining to the issue (Asiah Bidin Shariffah Nuridah Aishah Syed Nong Mohamad & Akmal Mohamad, 2015). Check this citation

Hargreaves and Prince (n.d.) in their research paper titled "Understanding Cyber Criminals and Measuring Their Future Activity" proposed a classification assessment to differentiate the two fundamental categories of cybercrime. The two categories are; computer enabled crime and computer dependent cybercrime. The key points to collect data on cybercrime are outlined in this research paper. The researchers stated that from the collection of

data, it will then lead to finding a successful method to prevent cybercrime (Hargreaves & Prince, 2013). This article does not focus on specifically Muslim students, but the researchers referred to it to understand cyber criminals and their tendency to commit cyber crime, especially among the youths.

The discussion paper titled "Mapping and Measuring Cybercrime" (Stefan Fafinski William H. Dutton and Helen Margetts, 2010) summarizes a few main issues raised on cybercrime during the OII Forum. This paper has effectively laid out crime reduction initiatives, identification of preventative measures, ways to educate and inform the public about cybercrime that may be gained through mapping of cybercrime. Reliable data that are obtained from this attractive mapping would offer better information on policy approaches to cybercrime and gauge their success.

A study conducted by Fetais and Shabana (2014) highlighted the key factors underlying cybercrime. This study showed that prevention shall be done by acting proactively; preventing the damage before it is done. This paper revealed that cybercrime can be prevented through strategies, such as individual awareness, offensive prevention, collaborations, and cyber surveillances.

In Broadhurst et.al's (2014) journal titled "Organizations and Cybercrime: An Analysis of the Nature of Groups Engaged in Cybercrime" (Broadhurst, Grabosky, Alazab & Chon, 2014), the researchers used comparative method to view cybercrime offences carried out by organizations and individuals. This study raised two basic questions about cybercrime. The questions that arose were, (i) the goals that are pursued by organizations and individual offenders; (ii) the relationship that exist between crime type and organizational form. From

the comparison made between individual offenders and criminal organizations, it was revealed that both possessed an impressive skill.

Cybercrime cases keep increasing worldwide, including in Malaysia due to accessibility of computer system and internet. In Malaysian scenario, cyber scam fall under fraud incident. Studies on cybercrime cases that occurred in Malaysia were carried out and mapped into several ethical theories (Alpna & Malhotra, 2016).
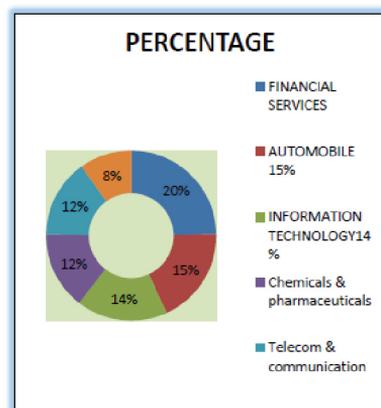

Figure 1: Cybercrime survey report 2014, KPMG in India [11] (Affected areas due to cybercrime)

Koon and Yoong (2013) (cited in Ahmad Safwan Hamsi et.al) defined cybercrime as insincerity of advance fee fraud schemes which use fictitious identities to approach and initiate romantic relationship with their targets. The intention is to defraud the victims of large sum of money using fake identities. The main reason to this was to make easy money or gain profit. This paper will focus on the Internet love scam, the ethical point of view of the whole scenario, illustrate cause of action and provide some solutions that may be applicable. Despite all the connecting factors highlighted, the internet love scams perhaps have gained the most minimal governmental control

social networks and dating match websites. Overall, views from the three theories; Kantianism, Act and Rule utilitarianism, and the Social contract agreed the love scammers' acts do not only break the law, but are also morally wrong. It is important for society to address this issue carefully so that the harmony of the society is sustained (Ahmad Safwan Hamsi Farrah Diana Saiful Bahry Siti Noraini Mohd Tobi and Maslin Masrom, 2015).

Brand said that one type of Internet addiction is excessive pornography viewing, also referred to as cybersex or Internet pornography addiction. Neuroimaging studies found ventral striatum activity when participants watched explicit sexual stimuli compared to non-explicit sexual/ erotic materials. A hypothesis construed that Internet pornography addiction fits into the addiction framework and shares similar basic mechanisms with substance addiction (Brand Mathias, Jan Snagowski, Christian Laier, Stefan Maderwald, 2016) His finding is supported by Todd Love. He mentioned that many recognize several behaviours potentially affect the reward circuitry in human brains that lead to a loss of control and other symptoms of addiction in several individuals. Pertaining to Internet addiction, neuro scientific research supports the assumption that underlying neural processes are similar to substance addiction (Love, Laier , Brand , Hatch and Raju Hajela, 2015).

Unawareness of the security of computer and mobile use has caused many Malaysians to be cheated by the cybercrime syndicates, thus triggering and endangering youngsters including Muslims. Sustainable and safe harmonious society should be built by handling this issue properly. Even though love scammers' actions through social contract agreement is morally wrong and breaks the law, young internet users are unable to avoid scams due to being unaware and having lack of knowledge.

Previous studies have not highlighted any direct relationship to fundamental Islamic Education which focus specifically on Muslim students. A study by Hilton Jr. shows that negative pornography affects the cognitive level of a human brain, causes addiction and self-control disability, disfunction and interruption of neurotransmitter (mentally, physically and emotionally) (cited in Medical Discussion Report on Positive and Negative Impacts of Internet and Information Technology, Faculty of Medicine, Universiti of Palangka Raya, 2014).

4. CONCLUSION

A few interviews conducted by researchers indicate that the main factors of pornography activities among the community are peer influence among teenagers and sexual curiosity. Easy access to the internet make it even more accessible. It leads to being addicted to sex-related activities, such as masturbation. Some cases lead to sexual harassment and rape. Findings from an interview with a counsellor found that pornography addiction will negatively affect mental and physical health. Most students involved lose their focus in their studies.

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