

PROCEEDING BOOK

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Research and Practices in Science,
Technology and Social Sciences

PROCEEDING BOOK

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UiTM CAWANGAN SELANGOR KAMPUS DENGKIL

**I-CReST 2022 International Conference on Research and Practices in Science,
Technology and Social Sciences: PROCEEDING BOOK/**

**Editors Zaid Mujaiyid Putra Ahmad Baidowi / Fadiatul Hasinah Muhammad /
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PREFACE

Assalamualaikum w.b.t. and Salam Sejahtera,

I would like to extend my heartfelt welcome and appreciation to all the participants of the 3rd



[Virtual] International Conference on Research and Practices in Sciences, Technology and Social Sciences (I-CReST) 2022. This year, I-CReST aims to continue to

provide a constructive and synergistic platform for academicians, researchers, and practitioners to partake in scholarly discussions on diverse topics within the interconnected fields of science, technology, and social sciences.

The call for participation for I-CReST 2022, via the theme of “*Transcending boundaries and sustaining livelihood through multidisciplinary research*”, has garnered around 180 registrations from participants within and beyond Malaysia. This theme reflects our move towards and the normalisation of the much-needed cross-disciplinary collaborations in interrelated areas of expertise among scholars across various geographical settings. This abstract book has been prepared to facilitate easy access to all the

contributions to I-CReST 2022, as well as promote fruitful networking among the participants. Evidently, the abstracts demonstrate a wide range of cross-disciplinary research topics that will hopefully motivate budding researchers and boost the momentum of established scholars to participate in meaningful research endeavours in dynamic ways.

My sincerest gratitude goes to all the participants, and also to the backbone of this conference, our dedicated I-CReST 2022 committee members. Your unwavering support and contributions have been phenomenal and made the organisation of this conference a pleasurable enriching and successful one.

On behalf of the Centre of Foundation Studies, UiTM Selangor, Kampus Dengkil, thank you and welcome to I-CReST 2022. May we see you again in I-CReST 2023!

Dr Fadiatul Hasinah Muhammad
Chairperson
I-CReST 2022

FOREWORD

Assalamualaikum w.b.t. and Salam Sejahtera,

A very warm welcome to all the presenters, participants, and established members of various academic and research institutions to the 3rd [Virtual]



International Conference on Research and Practices in Science, Technology and Social Sciences (I-CReST) 2022. It is an honour for us at the Centre of Foundation Studies, UiTM, to

have all of you in this event. It is satisfying and fulfilling to have received, once again, a record number of abstracts submitted. The responses to the call for papers had been overwhelming - both from Malaysia and overseas. It is indeed a privilege to present this book of abstracts on various research works that befit the theme, *“Transcending boundaries and sustaining livelihood through multidisciplinary research”*.

The human race has been challenged by one of the greatest threats to its survival through the spread of COVID-19. The repercussions are serious, and to some extent, fatal. The implications are felt by many throughout the world and these could clearly be seen in a myriad of sectors - healthcare, education, economic and financial services, tourism, and agriculture - to name a few. These are further worsened by the occurrences of a series of floods, political instability, rising costs of basic necessities, and many more. Hence, it is high time for the most crucial players – academicians, researchers, and those in the industries – to collectively work together in a conference like I-CReST 2022 through

their research findings and intellectual discussions.

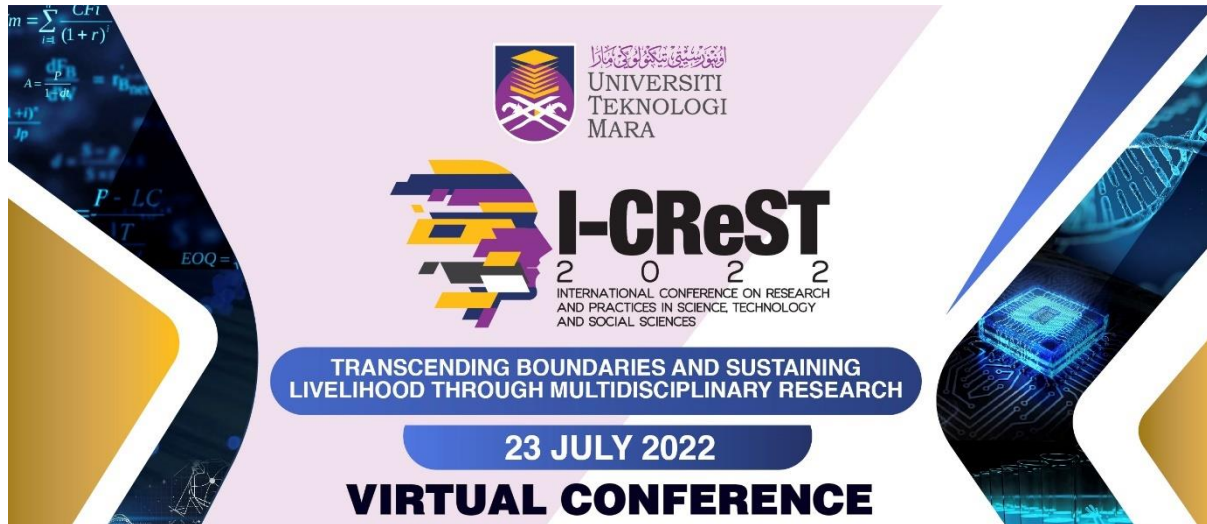
I am optimistic and full of hope that this conference will become an avenue for presenting and discussing issues, challenges, and opportunities, as well as for insightful sharing of knowledge and brilliant ideas on various subject matters. This way, possible solutions can be applied to the everyday challenges that have affected our lives and sustainability. These efforts can subsequently help us find the common ground to withstand challenges for a better, healthier, and merrier world.

My heartiest gratitude goes to the reviewers who worked hard to help maintain the high quality of the abstracts and manuscripts to be published in the proceedings or journals. This conference would not be possible without the laborious preparation by all members of the Organising Committee, headed by Dr. Fadiatul Hasinah Muhammad. A huge thank you for their extensive efforts.

I hope that everyone will have a wonderful and fruitful time attending the I-CReST 2022 Virtual Conference. Best wishes and I trust that all your hard work will yield positive results.

Professor Ts. Dr. Saifollah Abdullah
Director
Centre of Foundation Studies
Universiti Teknologi MARA (UiTM)
Cawangan Selangor
Kampus Dengkil

ABOUT THE CONFERENCE



The International Conference on Research and Practices in Science, Technology and Social Sciences (I-CReST) is an annual event organised by the Centre of Foundation Studies, Universiti Teknologi MARA (UiTM), Malaysia. With this year's theme, "*Transcending boundaries and sustaining livelihood through multidisciplinary research*", it aims to provide a constructive virtual avenue for researchers and scholars across the globe to network with each other via the presentation of their impactful research works. In response to the spread of COVID-19 and its devastating effects, the conference focuses on providing a platform for the dissemination of research findings and intellectual discussions on diverse topics relating to sustaining livelihood. This conference has a typical format of 20-40 minutes of sharings or presentations by plenary and keynote speakers, as well as invited presenters, who are experts in their respective fields. The slots are subsequently followed by the Q&A or discussion session. This conference has also made it possible for more presentations in the form of pre-recorded videos that are streamed via YouTube, thus promoting more academic engagement. Since its inaugural event in 2020, I-CReST has received tremendous positive responses from participants of various educational and industrial backgrounds. I-CReST 2022 garnered around 180 abstracts on cutting-edge topics within the scopes of science, technology and social sciences, as well as those of cross-disciplinary nature. The conference also provides opportunities for publication in proceedings with e-ISBN. Selected papers will be considered for publication in journals indexed by WOS/Scopus/MyCite/MyJournal after a thorough peer-reviewed process.

THEME SYNOPSIS

I-CReST 2022's main theme addresses **FIVE** (5) tracks to encourage scientific writing/publication across multidisciplinary research in the broad fields of the following.

Physical Sciences:

Medical Physics; Nuclear Physics;
Photonics; Optics; Spectroscopy; Device
Physics; Material Science; Polymers;
Nanotechnology; Solid State Ionics;
Inorganic and Organic Chemistry; Natural
Products Chemistry; Catalysis; Renewable
and Sustainable Energy

Biological Sciences:

Botany; Forestry; Ecology; Zoology;
Entomology; Microbiology;
Biotechnology; Genetics; Bioinformatics;
Nutraceutical; Cosmeceutical;
Pharmaceutical; Pharmacology;
Biomedicine; Health Sciences

Information Technology, Engineering and Mathematics

Human-Computer Interaction; Information Virtualization; Modelling and Simulation;
Computer Security; Wireless and Mobile Communications; Software Engineering; Internet
of Things; Data Analytics; Multimedia Computing; Information Retrieval; Electronic
Learning; Artificial Intelligence and Machine Learning; Web Technology; Pure and
Applied Mathematics; Mathematics Education; Mathematical Modelling; Mathematical
Statistics; Fuzzy Mathematics and Applications; Operations Research

Social Sciences & Humanities

Education/Pedagogy; Communication Arts; Information Communication;
Linguistics/Neurolinguistics/Sociolinguistics; Literature and Poetry; Educational
Management and Leadership; Early Childhood Education; Panicgogy; Civil Law;
Economics and Financial Law; Human Right Law; Public Law; Islamic Law; Contract
Law; Consumer Law; Comparative Law; Commercial Law; Competition Law;
Constitutional Law; Environmental Law; Family Law; Medical Law; Private Law; Social
Policy and Social; Legislation; Legal Education; Criminology; Al-Quran and Hadith;
Aqidah and Islamic Thoughts; Muamalat; Halal Management; Education and Shariah;
Astrofiah and Cosmofiah; Dakwah and Human Development; Economics

Science, Technology, Engineering and Mathematics (STEM)

Life Science & Biotechnology; Mathematics and Engineering; Coding and Robotics; 3D
Design and Printing; Drone and Aerospace; Internet of Things (IoT); Communication and
Video Making; Educational Kits; Electronic Board; Virtual Reality; Virtual Classroom;
Mobile Apps/Games; Others

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PROCEEDING PAPERS

PHYSICAL SCIENCES

I-CReST 2022:021-006 - Particleboard from Oil Palm Empty Fruit Bunch (OPEFB): Effects of Density and Resin Content

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ABSTRACT

Particleboard is growing nowadays. In Malaysia, particleboard usually made from rubberwood or mix hardwood. However, because of the supply of the wood were decrease, new raw material is required. Empty fruit bunches are a waste from the oil palm industry. This research aims to determine the effects of density and resin content on oil palm empty fruit bunches (OPEFB). The empty fruit bunches were used as a raw material with urea formaldehyde as a binder to manufacture particleboard. Nine different types of particleboards were produced, board with 8%, 10% and 12% resin content, and board with different target density with 500, 600 and 700 kg m⁻³ at temperature 165⁰C and a pressing time of 6 minutes. The mechanical properties; modulus of rupture (MOR), modulus of elasticity (MOE) and internal bonding (IB) and physical properties; thickness swelling (TS) and water absorption (WA) of particleboard were determined. The results indicated that with increased the density and resin content, the board increased significantly for mechanical and physical properties of the EFB particleboard. It gives better performance to strength of particleboard. The best result is produced from board with density of 700 kg m⁻³ and resin content is 12% and did not meet the minimum requirement for particleboard in Japanese Industrial Standard (JIS A 5908). Much work perseveres to be done with EFB. The treatment for the EFB maybe will have the potential and enhance the properties of the particleboard.

Keywords: EFB; density; resin content

1. INTRODUCTION

Malaysia is renowned as the second largest oil palm producers and exporters in the world. In 2019, the Malaysian oil palm industry shown a better performance. The oil palm planted areas reported in Malaysia is 5.90 million hectares (in 2019), and the number increase 0.9% in the previous year (2018) [1]. Thus, the number of biomasses wastes also increase and were generated from this agricultural activity. The highest residue of solid waste was 20-23% EFB, 15% palm fibre from fresh fruit bunches and 5.5-8% palm shells [2].

Factors for decreasing in production also because of climate change and less areas for plantation of oil palm. With the 6 million hectares of plantation, oil palm industry in Malaysia able to generate 100 million tons of biomass including oil palm trunks (OPT), oil palm fronds (OPF), kernel shell, empty fruit bunch (EFB) and other residues. Amount of EFB per year, they can reach 10 million tons which only 10% is used and the rest are abundant. It is usually burnt as fuel and other usage is becoming fertilizers [3].

Abundance of EFB is main reason for maximizing its usage especially for composite manufacturing purpose. Neither use it as single material or mixed it with solid wood to produce hybrid particleboard or fibreboard. By doing this, the usage of solid wood can be reduced because the presence of EFB as substitute material. This means there is huge amount of EFB to be processed to become engineered product. EFB also can become solution of the raw material problem especially in composite manufacturing [4].

Soon, solid wood would not be able to meet the demand of making composite board such as particleboard, fibreboard, and other composite product. As stated by [5], industry of wood composite already having big problems because not enough solid wood resources for being use as raw material. Now they move to another option which is agricultural wastes or also being called as biomass. During the recent years, the demand for solid wood currently is higher compared to available resources. Manufacturers need to find new option in replacing the solid wood as their main raw material. Without raw material, the operation of manufacturer is stopped, and the products will not be being produced. As the demand cannot be achieved, it will cause more problems in the aspect of marketing and customer trust.

Due to the aspect of plant productivity, the availability of empty bunches raw material will increase every year and eventually decline. Due to the age of the plant and its effect on the productivity of the plant, this results in a decline. [2]. Abundance of biomass and shortage of solid woods is looked very closely related problems but bring the solution at the same time. However, the problem is making biomass as suitable replacement for solid wood in the aspect of strength and application. Biomass such as EFB and fronds is not strong and good as solid wood, but the supply is better with cheaper price. Research and analysis need to be done so the potential of these biomass materials can be utilized significantly.

This paper presents the OPEFB particleboard with urea formaldehyde resin with 12 mm of the final board thickness for the final product. The purpose of the investigation was to determine the effect of different density and resin content on the physical and mechanical properties of the OPEFB particleboard.

2. MATERIALS AND METHODS

2.1 Material Preparation

Main raw material is the oil palm empty fruit bunch (OPEFB) which is collected from Jengka Advanced Renewable Energy Plant (JAREP) located in Jengka 9. The EFB was going for flaking process using knife ring flaker. The purpose is to convert the EFB material into particles. Then the particles are undergone screening process using screener machine. The particles are fed over to vibrating flat series of screens. This particle separator is segregated the particles according to specific size of particle and removing the dust. Then, the particle that already being screened is dried until reaches below than 5% moisture content by using oven at 80°C for at least 24 hours.

2.2 Particleboard Manufacturing

The particles that have around 5% moisture content was then mixed and blended using particleboard mixer and use different resin content of 8%, 10% and 12% separately. The aim of this blending process is to ensure every particle involves in improving strength of board so

resins particle must be distributed evenly and completely over the surface of particles. The glue and particles were combined and mixed in particleboard mixer.

After the particles are blended with resin then it is manually distributed into wooden mould for producing blending particles in mat form. Before forming the caul plate need to be spray with silicone release agent for the purpose of avoiding the particles stuck at the plates. The purpose of mat forming is to provide uniform mat weight at whole over the area of board.

Then, the cold press is for reducing risks of disturbance of graded structure when it is being transferred to hot press. This process also can improve the density and strength of board. Another important reason is cold press able to reduce the thickness of mat so can avoid probability the blowout of air because air rushing out when pressing is applied. During using hot press machine, the mats are placed in the press accommodating one sheet at one time. For hot press, it is curing the adhesive and set up the final thickness of board which is 12 mm. The board was go through 3 different pressures which is 1800 psi, 1200 psi and 800 psi with the period is 180 second, 120 second and 60 second. The reason for applying pressure is to ensure the resin and wood particle is cured as expectation and can increase strength of board.

After hot press is done, the board is left for conditioning until the moisture content was constant. All board is being trimmed and cut according to the testing requirement and ready for the next process which is board testing. The samples were then test for bending test, internal bonding test, water absorption test and thickness swelling test. All the testing and requirement is according to the JIS A 5908:2003 standard.

The statistical analysis is provided using the SPSS software. The mean and analysis of variance (ANOVA) is used to assess the average and significance effect of density and resin content on mechanical and physical properties of particleboard made from oil palm empty fruit bunch. Meanwhile Duncan's multiple range test (DMRT) was done to evaluate the comparison of averages.

3. RESULTS AND DISCUSSION

3.1 Board Properties from Oil Palm Empty Fruit Bunches Particleboard

Table 1 shows the mechanical and physical properties of particleboard from oil palm empty fruit bunches according to the board density, and resin content. The increase in the board density showed higher MOR, MOE and IB, and showed lower water absorption and thickness swelling values. The use of higher resin content showed an increasing trend in all the mechanical and physical properties values. Boards made from density 700 kgm^{-3} performed better than 600 kgm^{-3} and 500 kgm^{-3} when resin content of the board was increased. The best performance of MOR (9.19 MPa), MOE (1049.83 MPa) and IB (0.16 MPa), thickness swelling (15.27%) and water absorption (81.06%) values was gained from board with target density of 700 kgm^{-3} , and 12% resin content. In general, only modulus of rupture was met the JIS A5908: 2003 Types 8 (base particleboard).

Table 1: Physical and Mechanical Properties of Particleboard from Empty Fruit Bunches

Density	RC	MOR	MOE	IB	TS	WA
500	8	0.85 (0.25)	263.68 (56.99)	0.02 (0.01)	48.04 (5.04)	172.52 (7.10)
	10	2.12 (0.22)	376.14 (75.73)	0.02 (0.01)	35.16 (3.58)	155.70 (9.35)
	12	2.69 (0.82)	563.34 (53.58)	0.06 (0.01)	31.67 (2.31)	122.26 (7.53)
600	8	1.53 (0.17)	347.07 (57.16)	0.06 (0.01)	34.12 (2.67)	143.57 (8.32)
	10	2.71 (0.53)	411.40 (66.49)	0.06 (0.01)	28.59 (4.86)	122.12 (6.28)
	12	3.33 (0.26)	582.71 (45.81)	0.11 (0.04)	22.57 (3.53)	106.47 (9.40)
700	8	5.00 (0.30)	700.59 (45.46)	0.08 (0.01)	35.85 (92.97)	99.46 (8.26)
	10	6.85 (0.70)	888.07 (59.57)	0.09 (0.03)	26.69 (2.14)	86.27 (4.33)
	12	9.19 (0.03)	1049.83 (56.62)	0.16 (0.03)	15.27 (0.91)	81.06 (5.77)
JIS A5908:2003	8	2000	0.15	12	-	-

*the standard deviations are shown in bracket, MOR – modulus of rupture, MOE – modulus of elasticity, IB – internal bond, TS – thickness swelling, WA – water absorption, RC – resin content

3.2 Statistical Significance

The analysis of variance (ANOVA) of the effects of density, and resin content and their interaction on the particleboard properties are shown in Table 2. The main factor of density and resin content were found to affect all the board properties significantly. The interaction effects of density and resin content showed no significant effect for all board properties except MOR and WA.

Table 2: Summary of ANOVA for the Effect of the Density and Resin Content on Mechanical and Physical Properties of Empty Fruit Bunches Particleboard

	df	MOR	MOE	IB	TS	WA
Density	2	383.74**	189.25**	24.19**	21.59**	151.82**
RC	2	86.23**	60.78**	16.93**	44.87**	58.09**
Density * RC	4	8.17**	1.08ns	2.50ns	2.32ns	3.81*

df – degree of freedom, MOR – modulus of rupture, MOE – modulus of elasticity, IB – internal bond, TS – thickness swelling, WA – water absorption, RC – resin content, ** highly significant at $p < 0.01$, * significant at $p < 0.05$, ns = not significant at $p > 0.05$

3.3 Effects of Board Density

Figure 1 shows the effects of board density on the bending properties of particleboard. Density was found to affect all the board properties significantly at $p < 0.01$. Board density of 700 kgm^{-3} indicated significantly higher MOR, MOE, IB, WA and TS values compared to those of 600 kgm^{-3} and 500 kgm^{-3} . The correlation coefficient (Table 3) revealed that all the bending

properties have good correlation for MOR ($r = 0.817$), MOE ($r = 0.784$), and IB ($r = 0.682$), increasing significantly with board density. Boards made with high density consist of high amount of OPT particles compared to boards at low density as reported by [6]

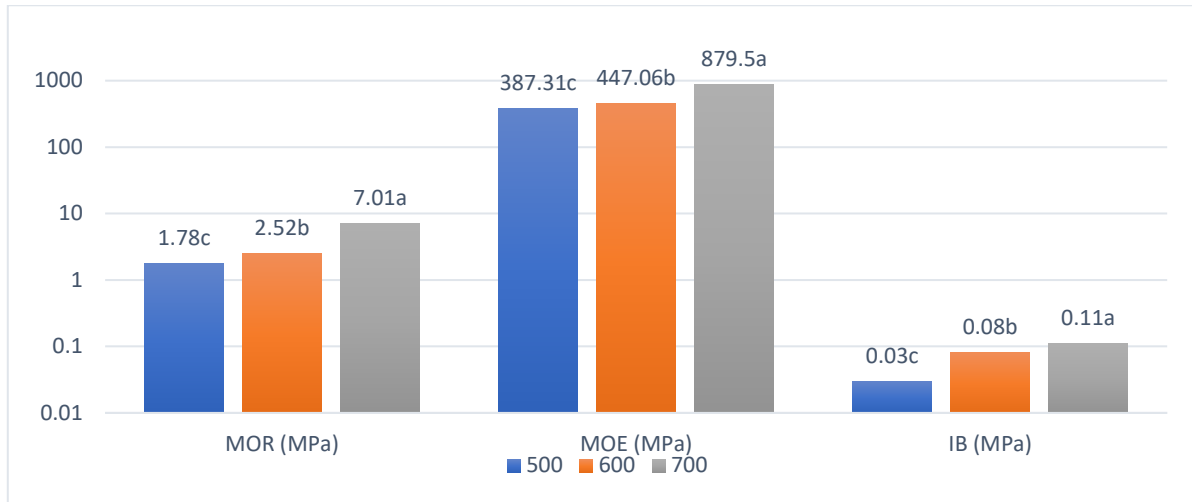


Figure 1: Effects of Density on Mechanical Properties

Table 3: Correlation Coefficients of the Relationship of Density, Resin Content, and Wax Content on Board Properties

Variable	MOR	MOE	IB	TS	WA
Density	0.817**	0.784**	0.682**	-0.544**	-0.823**
Resin	0.440*	0.503**	0.513**	-0.712**	-0.474**

Notes: * significant at $p < 0.05$, **highly significant at $p < 0.01$.

Thickness swelling and WA of board exhibited similar trends as shown by bending properties (Figure 2). The TS and WA showed to increase positively with the increase in board density (500 to 700 kgm^{-3}). The correlation analysis further revealed that TS and WA showed negative correlation with board density ($r = -0.544$ and $r = -0.823$, respectively). More amounts of particle would increase the thickness swelling. This is due to lower water resistance of the particles and urea formaldehyde linkage hydrolysis [7].

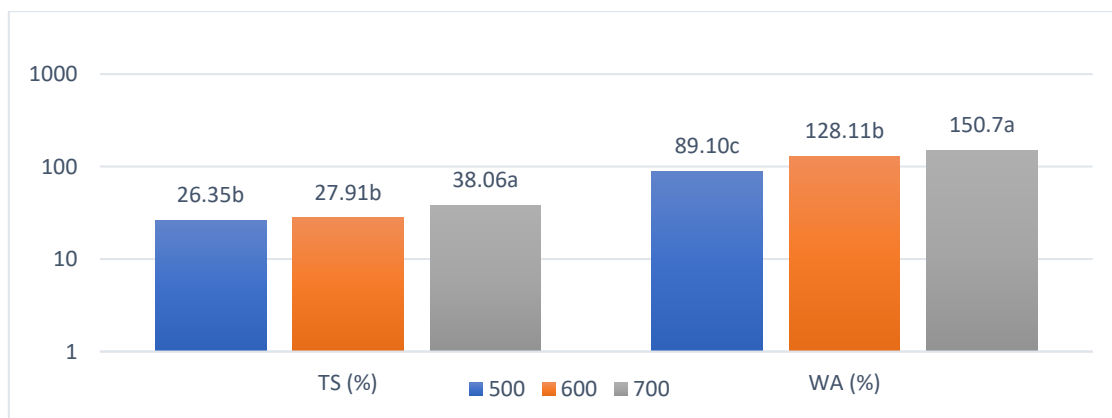


Figure 2: Effects of Density on Physical Properties

3.4 Effects of Resin Content

The effects of varying resin content on the mechanical properties of the particleboard are shown in Figure 3. Higher resin content normally gives better bending properties for the particleboard [8]. The MOR, MOE, and IB values were affected by the increase of resin content from 8% to 12%. Board with 12% resin content have higher MOR (5.07 MPa), MOE (731.96 MPa), and IB (0.11 MPa) values. Strength of covalent bond arising from crosslinking of fibre which enhanced the mechanical strength of the boards. The correlation analysis (Table 3) further revealed that the MOR ($r = 0.440$), MOE ($r = 0.503$) and IB strength ($r = 0.543$) were increased resin content positively. According to [9], the increase in resin content could improve the bonding quality and increase the surface contact between resin and particles. According to [10] reported that lower performance of resin content is due to insufficient resin to bond the particles.

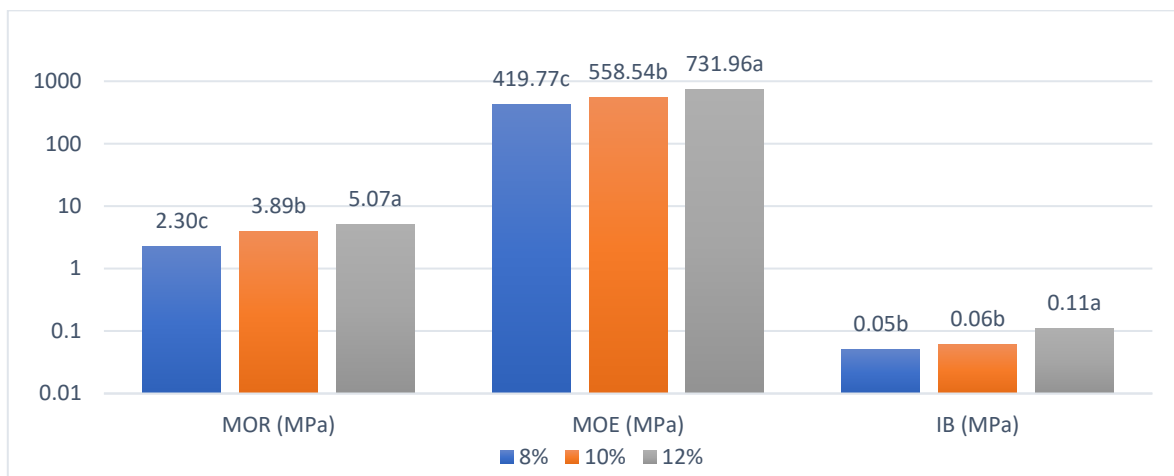


Figure 3: Effects of Resin Content on Mechanical Properties

Resin content was the main parameter influencing the physical and mechanical properties of the boards [11]. Resin content had a significant effect on thickness swelling after 24 hours of immersion in water. The thickness swelling and water absorption showed improvement when the resin content was increased from 8% to 12% (Figure 4). The correlation analysis (Table 3) further revealed that the thickness swelling ($r = -0.712$) and water absorption ($r = -0.474$) values showed a negative correlation with the rise of resin content. More coated particle surface increased intimate contact between particles and less water uptake for WA and TS with increase of the resin content. According to [12], the dimensional stability of the boards was significantly improved by increasing the resin content.

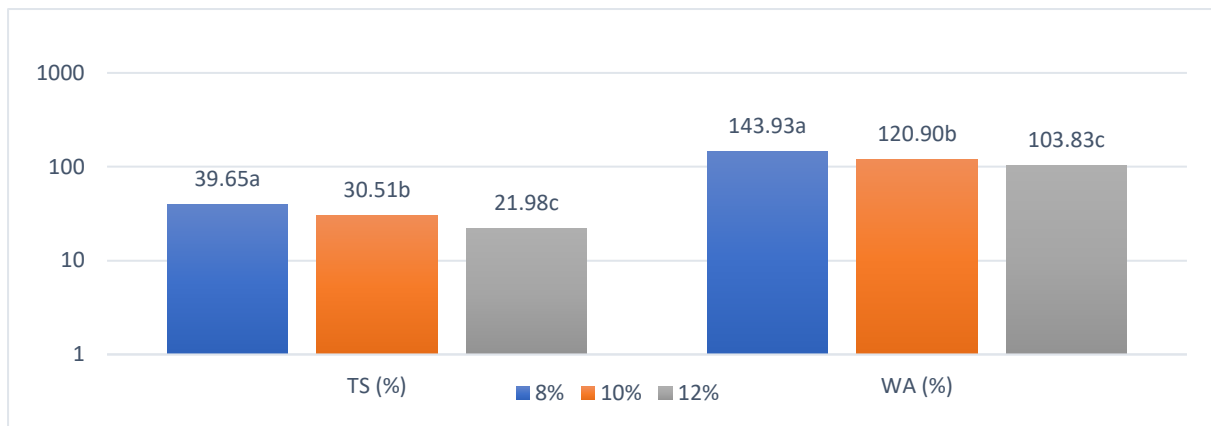


Figure 4: Effects of Resin Content on Physical Properties

4. CONCLUSION

The findings from this study expose that particleboard made from EFB is possible to produce but need high improvement in the aspect of mechanical and physical properties. All the amount of resin content and board density used in this study unable to pass the minimum requirement of JIS A 5908:2003 for Type 8 particleboard except MOR.

From the results, increase in board density from 500 kg m^{-3} , 600 kg m^{-3} and 700 kg m^{-3} is influenced the strength of board properties. Higher board density produces the board with better performance in mechanical and physical properties. In this study, 700 kg/m^3 EFB particleboard has the highest strength and better performance in all the tests. Resin content amount gives significant effect on mechanical and physical properties of EFB particleboard. Increasing in resin content caused the increase in strength properties of board and 12% resin content is the amount of resin that gives the best result in this study.

The mechanical and physical properties of EFB particleboard can be improved so it is able to be commercialized in the future. Different amount or type of resins can be applied to get better performances of EFB particleboard. Besides that, other parameters such as EFB treatment and addition of wax probably can improve the strength properties of EFB particleboard.

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I-CReST 2022:109-091 - Spectroscopic Properties of Erbium-Doped Zinc-Sodium Tellurite Glass via Incorporation of Bimetallic TiO₂-Au Nanoparticles

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ABSTRACT

This study reports the spectroscopic properties of tellurite glass with composition of $(70-x-y)\text{TeO}_2-20\text{ZnO}-9\text{Na}_2\text{O}-1\text{Er}_2\text{O}_3-(x)\text{TiO}_2-(y)\text{Au}$ where $x = 0, 0.3 \text{ mol\%}$ and $y = 0, 0.03, 0.05, 0.10, 0.15, 0.20 \text{ mol\%}$ were synthesized using the melt-quenching technique. Glasses were characterized using XRD and UV-Vis. The glass samples containing erbium were orangish in color while the glass samples without erbium content were yellow in color. The XRD result shows the existence of broad humps in the range of 25° to 35° affirms the amorphous nature of glass. The UV-Vis spectra of glass samples show the appearance of eight absorbance peaks representing the transitions of erbium ion from the ground state to excited state.

Keywords: Tellurite glass; melt-quenching; nanoparticles; amorphous; erbium transition

1. INTRODUCTION

Glass is defined as an amorphous solid that does not have a complete long range of periodic atomic structure and exhibits the behavior of a glass transformation [1]. In other words, glass is a material that was formed by any technique which gives a transformation of transparent, translucent, and hard. Tellurite glass possesses low phonon energy which is beneficial for many applications especially in optical storage applications. In addition, tellurite glass exhibits high refractive index and excellent transmittance. Tellurium was considered as a good host for a wide variety of dopants such as rare earths and transition metals [2]. Erbium as rare earth doped glasses are exponentially growing due to their ability to enhance the optical and structural properties of glasses. Zinc oxide and sodium as modifier probable to improve the stability of the glass system.

The incorporation of metallic nanoparticles (NPs) in the glass matrix leads to a strong modification in the glassy network and the local environment of rare-earth (RE ions) [3]. Nowadays, bimetallic NPs such as core shell structures have gained interest as it has been enormously investigated due to their potential in modifying the microscopic properties [4]. Titanium NPs are used as dopants due to its chemical stability, high reactivity under UV light irradiation and lower cost. The inclusion of noble metallic NPs in a glass system results in significant modifications in the optical properties of RE-doped materials [5]. In this work, we report the effect of bimetallic TiO₂-Au NPs induces variations in the spectroscopic properties of erbium-doped tellurite glasses.

2. EXPERIMENTAL DETAILS

Table 1 shows a series of glass with nominal composition of $(70-x-y)\text{TeO}_2-20\text{ZnO}-9\text{Na}_2\text{O}-1\text{Er}_2\text{O}_3-(x)\text{TiO}_2-(y)\text{Au}$ where $x = 0, 0.3 \text{ mol\%}$ and $y = 0, 0.03, 0.05, 0.10, 0.15, 0.20 \text{ mol\%}$ was prepared by using a melt-quenching technique. The raw materials were weighted by using Electronic Balance. Each batch of glass has 15 ± 0.001 grams of total weight of constituent powders. Milling process was performed with a duration of 30 minutes to attain a homogeneous powders mixing. Then, the powders were placed into a platinum crucible. Further, the platinum crucible was kept in a muffle furnace Carbolite CWF with temperature of 970°C for 30 minutes. Then, the molten was poured into a brass mould which was kept in the second furnace and subjected to annealing process with a temperature of 300°C for 3 hours. Then, the glass was polished and cut for further characterization. The amorphous nature of glass was examined by using PANalytical X'Pert 3 MRD using Cu radiations ($\lambda = 1.54 \text{ \AA}$) operated at 40 kV and 30 mA with scanning angle of 2θ ranging between 5° and 80° . The absorbance spectra were determined by using CARY-60 UV-Visible light spectroscopy in the range of 190 to 1100 nm. All characterizations were performed at room temperature.

Table 1: Glass code with their respective composition with erbium content

Glass Code	TeO ₂ (mol%)	ZnO (mol%)	Na ₂ O (mol%)	Er ₂ O ₃ (mol%)	TiO ₂ (mol%)	Au (mol%)
TZNE	70	20	9	1	0	0
TZNETi	69.7	20	9	1	0.3	0
TZNETiAu0.03	69.67	20	9	1	0.3	0.03
TZNETiAu0.05	69.65	20	9	1	0.3	0.05
TZNETiAu0.10	69.60	20	9	1	0.3	0.10
TZNETiAu0.15	69.55	20	9	1	0.3	0.15
TZNETiAu0.20	69.50	20	9	1	0.3	0.20

Table 2: Glass code with their respective composition without erbium content

Glass Code	TeO ₂ (mol%)	ZnO (mol%)	Na ₂ O (mol%)	TiO ₂ (mol%)	Au (mol%)
TZN	70	20	9	0	0
TZNTi	69.7	20	9	0.3	0
TZNTiAu0.03	69.67	20	9	0.3	0.03
TZNTiAu0.05	69.65	20	9	0.3	0.05
TZNTiAu0.10	69.60	20	9	0.3	0.10
TZNTiAu0.15	69.55	20	9	0.3	0.15
TZNTiAu0.20	69.50	20	9	0.3	0.20

3. RESULTS AND DISCUSSION

3.1 Physical Appearance

Figure 1 shows the physical appearance of the glass samples (orangish in color) with Er^{3+} content (coded as TZNE, TZNETi, TZNETiAu0.03, TZNETiAu0.05, TZNETiAu0.10, TZNETiAu0.15 and TZNETiAu0.20). Figure 2 shows glass samples without erbium content appear yellowish in color (coded as TZN, TZNTi, TZNTiAu0.03, TZNTiAu0.05, TZNTiAu0.10, TZNTiAu0.15 and TZNTiAu0.20). The change in color was due to the presence of Er^{3+} in Te based glass that favors the absorption of distinct wavelengths in the visible spectrum [6]. Though, there is no color variation observed on the glass samples with addition of TiO_2 and Au NPs.

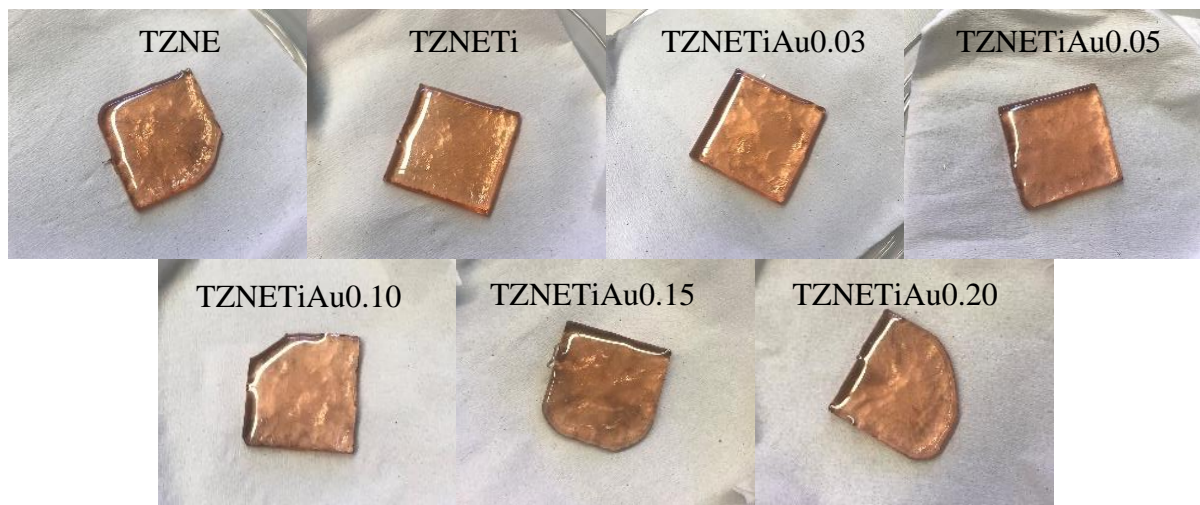


Figure 1: Glass samples with Er^{3+} content

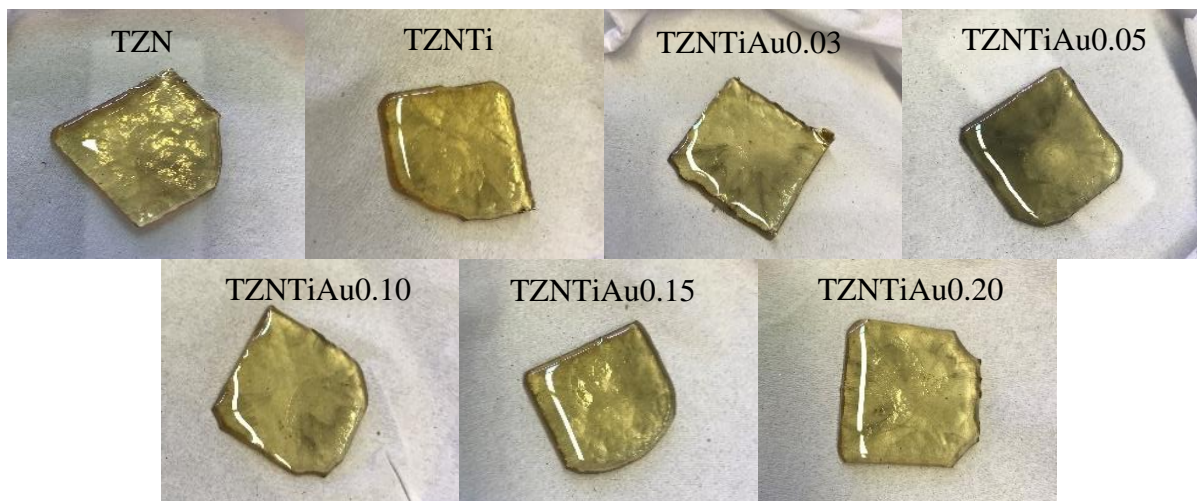


Figure 2: Glass samples without Er^{3+} content

3.2 Structural Properties

Figure 3 shows the using X-ray Diffractometer (XRD) spectra with varying concentrations of TiO_2 and Au content in the glass matrix. The XRD spectra illustrate the presence of a broad hump in the range of 25° to 35° with the absence of sharp crystallization peaks which verifies the glass samples are in amorphous nature [7]. The presence of a broad hump reflects that the glass exhibits the absence of long-range atomic arrangement which had confirmed the amorphous nature of glass [8]. It also reflects that the system possesses structural relaxation and transformation within the glassy region [9].

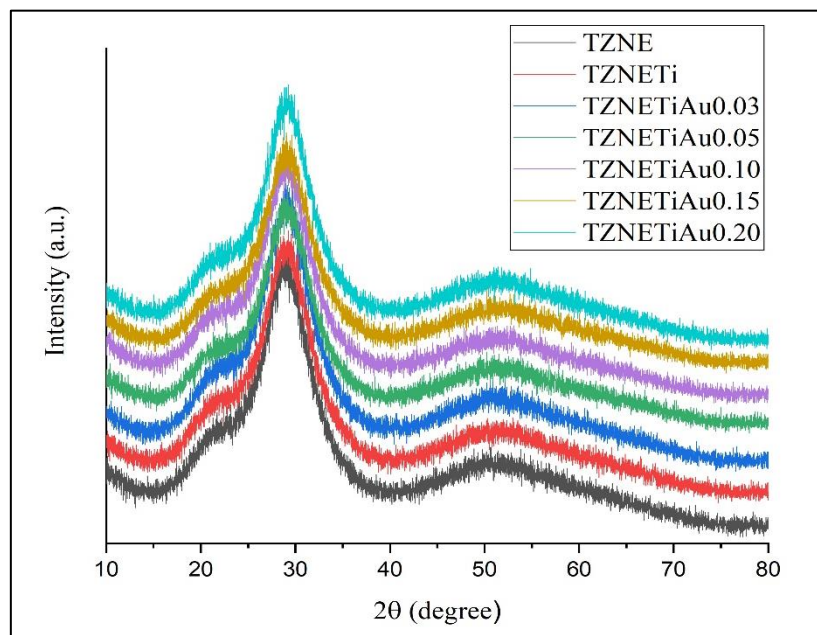


Figure 3: XRD pattern for all glass samples.

3.3 Optical Properties

Figure 4 shows UV-visible absorption spectra of glass with varying concentrations of TiO_2 NPs and Au NPs. The absorption spectra were recorded in the range of 400 nm to 1100 nm. The absorption peaks were attributed to structural rearrangements of the glass due to the 4f–4f transition in erbium ions in the glass matrix [10]. Eight absorption peaks were observed at different wavelengths and their corresponding erbium transitions are summarized in Table 3. Figure 5 illustrates the transition of erbium based on the wavenumber value with respect to energy levels of trivalent lanthanide aquo ions. The absorption spectra bands are located at around (411, 446, 487, 521, 545, 653, 798, 975) nm, respectively. These peaks represent the transition of Er^{3+} ion from ground state ($^4\text{I}_{15/2}$) to an excited state energy level ($^4\text{F}_{3/2}$, $^4\text{F}_{5/2}$, $^4\text{F}_{7/2}$, $^2\text{H}_{11/2}$, $^4\text{S}_{3/2}$, $^4\text{F}_{9/2}$, $^4\text{I}_{9/2}$, and $^4\text{I}_{11/2}$).

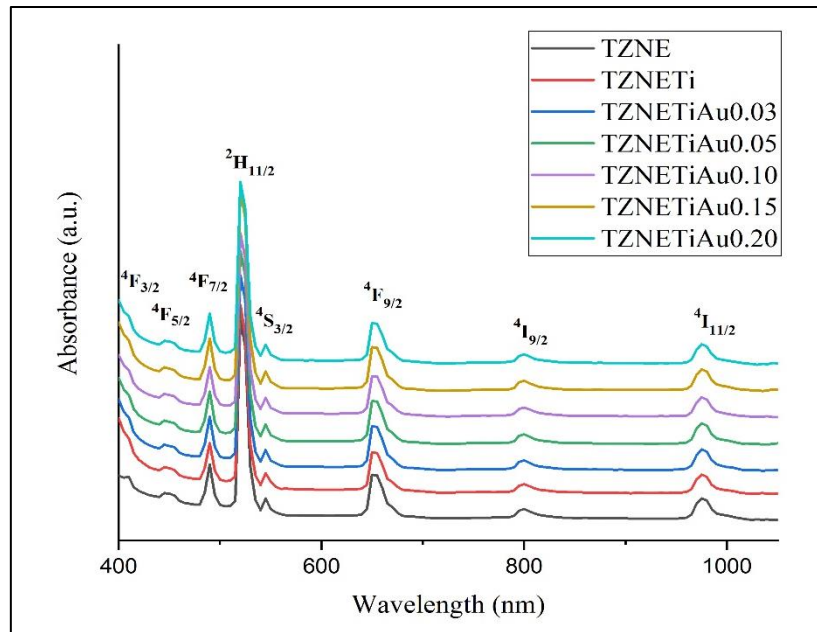


Figure 4: UV-VIS absorbance spectra in the range of 400 to 1100 nm of glass samples

Table 3: The absorption peak positions and transitions of Er³⁺ ion from ground state to excited state of energy level

Peak Position (nm)	Wavenumber (cm ⁻¹)	Erbium Transition
411	24 331	$^4I_{15/2} \rightarrow ^4F_{3/2}$
446	22 421	$^4I_{15/2} \rightarrow ^4F_{5/2}$
487	20 534	$^4I_{15/2} \rightarrow ^4F_{7/2}$
521	19 194	$^4I_{15/2} \rightarrow ^2H_{11/2}$
545	18 350	$^4I_{15/2} \rightarrow ^4S_{3/2}$
652	15 337	$^4I_{15/2} \rightarrow ^4F_{9/2}$
798	12 531	$^4I_{15/2} \rightarrow ^4I_{9/2}$
975	10 256	$^4I_{15/2} \rightarrow ^4I_{11/2}$

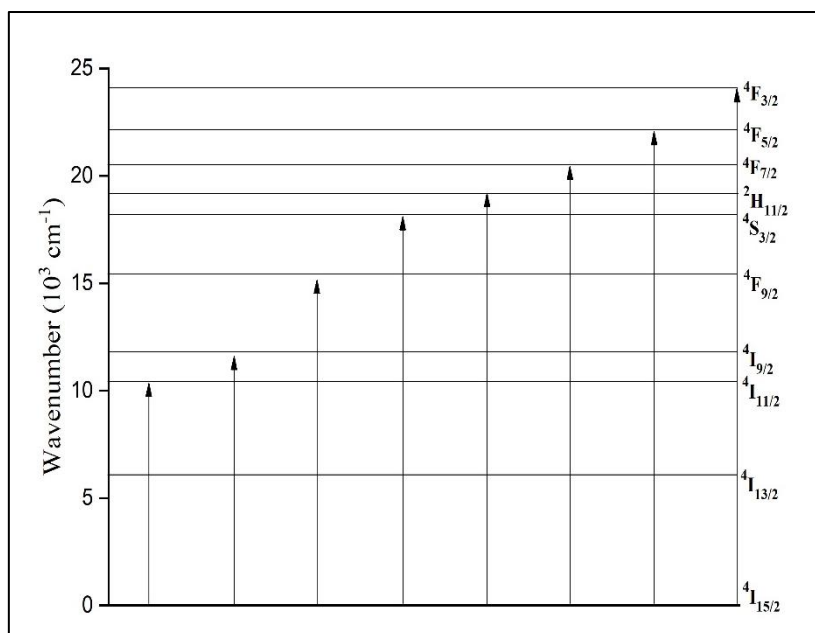


Figure 5: Energy diagram shows the transition of Er^{3+} ions from the ground state to the excited state

4. CONCLUSION

Glass samples of Er^{3+} doped zinc tellurite glass with different concentrations of bimetallic TiO_2 -Au NPs were prepared by using melt-quenching technique. XRD pattern confirms the amorphous structure of the glass. The UV-Vis characterization shows the transition of erbium centred at 411, 446, 487, 521, 545, 653, 798, and 975 nm.

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I-CReST 2022:126-139 - Mechanical Properties of Composite Plaster of Paris with Addition of Bamboo Fibers

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ABSTRACT

Organic fiber attracts attention among researchers and emerges as an alternative to reinforce brittle material instead of using synthetic fibers which are expensive and toxic. A series of Plaster of Paris with incorporation of bamboo fibers with size of 63 μm , 125 μm , and 250 μm were prepared using a conventional mixing method. The physical appearance and mechanical properties of plaster were determined using a camera and Universal Mechanical Testing machine. Plaster containing bamboo fibers appears brownish in color. Compressive strength of plaster lies in the range of 7.754 – 9.232 MPa. The incorporation of smaller size of bamboo fibers with size of 63 μm shows the highest compressive strength. Nevertheless, the incorporation of bamboo fibers with bigger size of 125 μm and 250 μm decreases the compressive strength.

Keywords: Plaster; fibers; adhesive materials; compressive strength; cracks

1. INTRODUCTION

Plasters are produced by the burning process of mineral gypsum, made of calcium sulfate. Therefore, plaster also known as gypsum plaster mixtures [1]. Plaster of Paris, also known as Gypsum Plaster in the form of white powder, emerges as a beneficial material when water is added to make a cementitious paste. Plaster of Paris are known due to abundant deposits of Gypsum in Montmartre, Paris. Plaster of Paris is prepared by heating calcium sulfate dehydrate, or gypsum to 120–180°C (248–356 °F). [2,3]. Plaster of Paris is a non-flammable, non-combustible, and low chemical reactivity. It can act as an oxidizing agent under extreme conditions. Though, it will decompose at high temperature to generate toxic oxides of sulphur. The physical and mechanical properties of Plaster of Paris are relatively strong when it is used as a cast. Gypsum is brittle, weak in tension, possesses low impact strength, and high-water solubility. Therefore, casting pure gypsum plaster without reinforcement agent was not practical for large structures. The presence of interstitial areas such as shrinkage cracking is probable to occur [4,5]. These detrimental properties would likely cause major damage to the cast structure when subject to applied loads. As an alternative, the shrinkage cracking can be reduced by adding a mixture of water with fiber to enforce the properties of plaster [6].

In the new global ecology, organic fiber has become a central issue as an alternative choice to reinforce brittle material instead of using synthetic fibers which are expensive and very toxic [4,5]. Fibers are usually used in casting and concrete to control plastic shrinkage cracking and drying shrinkage cracking. Some types of fibers produce great impact, abrasion, and shatter resistance but some fibers reduce the strength of the casting. There are several different types

of fibers generally used in the industries such as, steel fibers, glass fibers, asbestos fibers, carbon fibers and organic fibers. An organic fiber or natural fiber may be chemically more inert than glass fiber or steel and cheaper than the other fibers. Natural fibers basically consisted of cellulose, hemicellulose, and lignin. Though, the properties of natural fibers vary depending on the age of the plant and growing condition [7]. Furthermore, compressive strength of earthen building materials is affected by the grain quality, grain distribution, quantity of minerals, quality of minerals, fabrication method, binding strength of the minerals, amount of water used in production, compaction work, and additives materials [8]. The current study reports alteration on the mechanical properties and generation of cracks on the surface of plaster with incorporation of bamboo fibers.

2. EXPERIMENTAL DETAILS

2.1 Extraction of Fibers

The extraction of bamboo fibers consists of a few steps. In the first step, the hard epidermis outer layer and inner wax rich layer of bamboo were cleaned thoroughly. Then, bamboo was subjected to the cutting process into splint and was followed with shredding process of the splint into thin layered bamboo. Then, the bamboo was soaked into 6% NaOH at room temperature for 48 hours. Chemical treatment was performed to remove the lignin and hemicellulose (weak boundary layers of natural fibers) which are vulnerable to the alkali environment of the gypsum [7]. After the completion of the soaking process, the fibers were rinsed under running distilled water to remove impurities. pH paper was used to test the pH level of soaking water to obtain a neutral pH level. Further, the drying process was performed by using an oven with a temperature of 60 °C for 24 hours. To obtain fine bamboo fibers, the fibers were subjected to a grinding process by using a heavy-duty blender. Finally, the sieving process was performed by using Sieving set/RX-29 (Tyler USA) to obtain bamboo fibers with a size of 63 µm, 125 µm, and 250 µm.

2.2 Preparation of Plaster

A series of plaster was prepared by using a conventional mixing method. To evaluate the mechanical properties and generation of cracks on plaster, approximately 2% (equivalent to 0.2 g) of fibers were incorporated in the gypsum matrix. Plaster with fibers consisting of 9.8 g of gypsum, 6.5 ml of distilled water, and 0.2 g of bamboo fibers. The ingredients were weighted using Electronic Analytical Balance and were kept in a container. An adequate distilled water was poured into the container and the mixture was stirred to attain a homogenous mixture. Then, the mixture was poured into a mould for the casting process. Further, the mould containing mixture was placed in the room temperature for the drying process. Upon the completion of the drying process, plaster was kept in an airtight container. Table 1 summarizes plaster code, plaster composition and size of fibers incorporated in the gypsum matrix.

Table 1: Plaster code, plaster composition, and size of fibers

Plaster Code	Plaster Composition			Size of Fibers (μm)
	Gypsum (g)	Distilled Water (ml)	Fibres (g)	
PPB-63	9.8	6.5	0.2	63
PPB-125	9.8	6.5	0.2	125
PPB-250	9.8	6.5	0.2	250

2.3 Characterization

The physical appearance of the as-cast sample and cracks on the plaster surface were captured by using a camera. The compression test was performed on the plaster with a dimension of 10 mm x 10 mm (height x width) by using Universal Mechanical Machine (Gotech/ai-7000I-10/fritsch/pulversette14). The samples were loaded in axial compression at crosshead speed of 1 mm/min with maximum stress at failure and compressive strength.

3. RESULTS AND DISCUSSION

3.1 Physical Appearance

Figure 1 shows the physical appearance of as-cast plaster with distinctive sizes of bamboo fibers. In general, plaster without bamboo fibers appears greyish in color. In the present work, the incorporation of bamboo fibers with size of 63 μm , 125 μm , and 250 μm was evidenced to change the plaster color to brownish color (PPB-63, PPB-125, and PPB-250). According to Risdonne et al. [1], modification on the color of plaster is affected by the impurities or natural impurities (calcium carbonate, clay (hydrous aluminium silicate) and other silicates, iron oxide, rock salt (sodium chloride) or other water-soluble sulfates, sulfur, strontium, and other elements which in turn change color from yellowish to brown and grey to dark color.

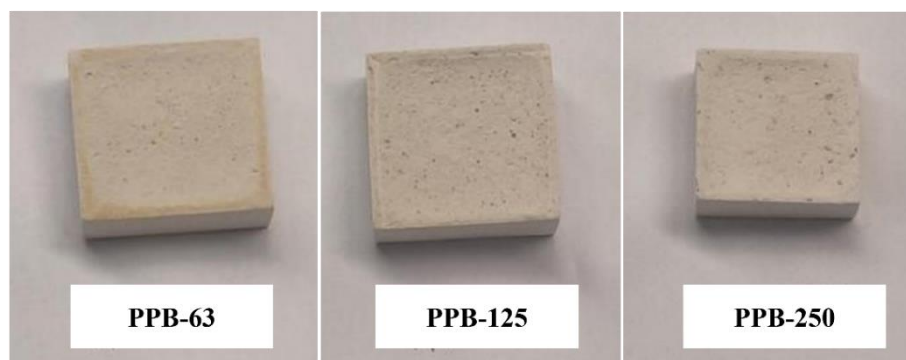


Figure 1: Physical appearance of as-cast plaster

3.2 Mechanical Properties

Compressive strength of concrete is the strength of hardened plaster measured by the compression test. The compression strength of plaster is the ability of plaster to resist loads which tend to compress it. Compressive strength of material can be calculated from the load applied at the point of failure to the cross-section area of the face on which load was applied [8].

$$\text{Compressive Strength} = \frac{\text{Load}}{\text{cross-sectional area}} \quad (1)$$

Poor earth materials may have strength as low as 1 MPa while optimum loam products can have strength as high as 10 MPa. In the present work, the compressive strength of plaster ranges from 7.754 MPa to 9.232 MPa. It is found that plaster containing smaller size of bamboo fibers (PPB-63) exhibits optimum compressive strength as compared to plaster containing bigger size of bamboo fibers (PPB-125 and PPB-250). It has been acknowledged that fibers have lower compressive strength. However, the incorporation of fibers in composite material can impede the lateral strain during the compression thereby improving compressive strength of the final product. The optimum compressive strength of plaster with smaller size of fibers (PPB-63) is due to the strong interfacial fiber-gypsum bonding which contributes to enhance crack resistance and efficient load transfer in the structure [6]. Our findings are in good agreement with Hostalkova et al. [9] in which using thinner fibers improves the compressive strength of plaster. Meanwhile, the incorporation of bigger fibers into gypsum matrix reduces the compressive strength of plaster (PPB-125 and PPB-250) due to inhomogeneous mixing with plaster and water or joining of the bamboo fibers into small clumps. This eventually causes inadequate bond of bamboo fibers with the binding gypsum. Thus, the bond between fibers and binding gypsum is weak which causes forces cannot be transferred efficiently to the fibers [8].

Table 2: Plaster code and determination of mechanical properties of plaster

Plaster Code	Compressive strength (MPa)
PPB-63	9.232
PPB-125	8.538
PPB-250	7.754

3.3 Generation of Cracks

Figure 2 shows the physical appearance of plaster after being subjected to impact. Plaster with small size of bamboo fibers (PPB-63) shows the appearance of cracks with moderate size. However, the cracks propagation became prevalent with incorporation of bigger sizes of bamboo fibers (PPB-125 and PPB250). According to Carvalho et al. [10], when fiber pullout predominates over fractures, fiber-matrix bonding affects the composite's toughness which in turn alters the possibility of post-fracture work. In the present study, combining smaller fibers with size of 63 µm with gypsum lessens its brittleness and enhances its mechanical properties prior to post-cracking behavior [6].

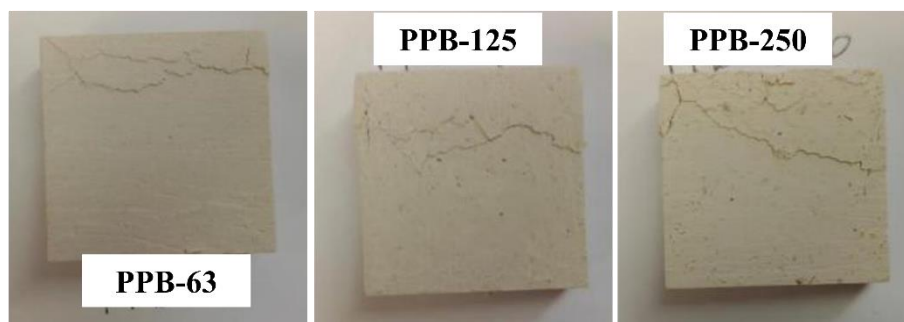


Figure 2: Images of plaster after the completion of compression test

4. CONCLUSION

This study investigated the mechanical properties of plaster with incorporation of different sizes of fibers in the range of 63 μm , 125 μm , and 250 μm . Plaster appears brownish in color due to the contribution of bamboo fibers. Plaster containing smaller fibers with size of 63 μm possesses optimum compressive strength due to strong interfacial fiber-gypsum bonding. Meanwhile, reduction in the compressive strength of plaster with incorporation of bigger bamboo fibers is affected by the formation of small clumps which leads to inadequate bond of bamboo fibers with the binding gypsum.

ACKNOWLEDGEMENT

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I-CReST 2022:222-213 - Numerical Modelling of Thickness Variation in $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) Thin Film Solar Cell using SCAPS-1D

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ABSTRACT

Cu₂ZnSnS₄ (CZTS) absorber material is a promising candidate to substitute CuIn_{1-x}Ga_xSe₂ (CIGS) thin film solar cell technology in the future. Therefore, in this work, a comparative performance evaluation based on thickness variation from 100 nm – 1000 nm of the absorber layer is investigated using SCAPS-1D numerical simulation. The proposed device structure of metal/CZTS/CdS/i-ZnO/metal has been simulated under light at AM 1.5G spectrum and the photovoltaic performance is analysed. It has been found that the optimum thickness of the absorber is 600 nm which gives J_{sc} = 23.215341 mA/cm², V_{oc} = 0.7681 V, and FF = 69.75 % which leads to 12.44 % PCE. These findings provide significant insight in designing practical experimental fabrication for the prospective CZTS.

Keywords: CZTS; SCAPS-1D; PCE

1. INTRODUCTION

An emerging photovoltaic $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) is considered as an alternative to replace a commercially matured $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ (CIGS) technology due to the scarcity of indium and relatively toxic selenium in CIGS composition [1]. The elemental constituents of CZTS are harmless to the environment. Moreover, they are naturally abundant to foster supply-demand chain in the future [2]. Figure 1 shows the abundance of chemical elements in the earth's crust. As shown, the availability of copper, zinc, tin and sulphur are 50 ppm, 75 ppm, 2.2 ppm and 260 ppm respectively [3]. In that sense, CZTS is among thin film solar cell technology which receives immense attention recently in effort to escalate pre-commercialization stage.

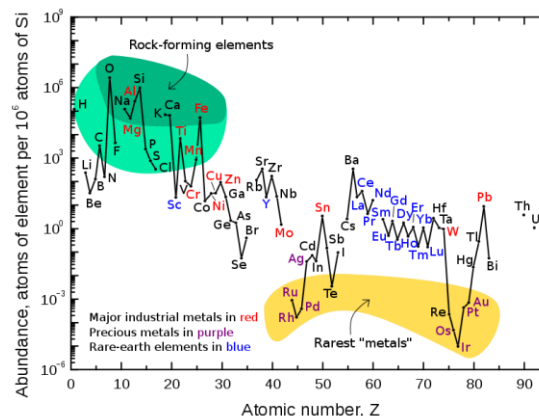


Figure 1: Abundance of chemical elements in the earth's crust [3]

CZTS usually crystallizes in the ground-state kesterite-type structure as shown in Figure 2. The unit cell contains 4 copper, 2 zinc, 2 tin and 8 sulphur atoms [4]. The intrinsic defect, mainly V_{Cu} antisite leads to acceptor defect which makes CZTS a p-type self-doped semiconductor [5]. In the view of semiconductor physics, CZTS thin film possesses excellent optical and electrical properties suitable for solar cell absorber layer operation. This includes direct bandgap of about 1.5 eV, and high absorption coefficient in the order of 10^4 cm^{-1} . The common CZTS solar cell device architecture consists of Mo back contact, p-type CZTS absorber layer, n-type CdS buffer layer, i-ZnO window layer, and Ag front contact [6].

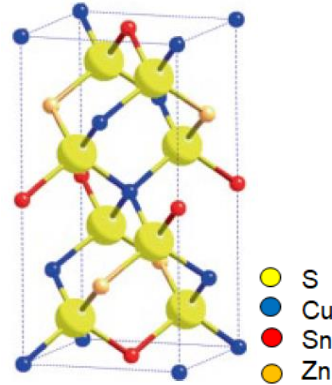


Figure 2: Crystal structure of kesterite-type CZTS [4]

Numerical simulation is an initial step compulsory to be taken in order to examine the photovoltaic performance of the cell before real fabrication is conducted in the laboratory. Besides to save cost and time, simulation ensures adherence to the device physics fundamentals towards realizing a working cell. Therefore, in this work, a numerical simulation of SCAPS-1D is performed to investigate the optimum thickness of the CZTS layer. The effect of thickness to the cell performance, namely short-circuit current (J_{sc}), open-circuit voltage (V_{oc}), fill factor (FF) and power conversion efficiency (PCE) are then reported and discussed. The findings would be beneficial in terms of designing practical experimental fabrication for the prospective CZTS.

2. SIMULATION DETAIL

CZTS solar cell model is simulated in Solar Cell Capacitance Simulator (SCAPS-1D) version 3.3.08. SCAPS-1D is one-dimensional computer simulation software for simulating alternating current and direct current electrical attributes of thin film heterojunction solar cells in steady conditions. The software was developed in ELIS, University of Gent and is made freely available to the photovoltaic research community. The simulation result is usually in good agreements with the experimental results [7].

SCAPS can solve the basic Poisson's semiconductor equations as follows:

$$d^2\psi(x)/dx^2 = e/\epsilon_0\epsilon_r (p(x) - n(x) + N_D - N_A + \rho_p - \rho_n) \quad (1)$$

$$dJn/dx = G - R \quad (2)$$

$$dJp/dx = G - R \quad (3)$$

$$J_n = D_n \frac{dn}{dx} + \mu_n n \frac{d\phi}{dx} \quad (4)$$

$$J_p = D_p \frac{dp}{dx} + \mu_p p \frac{d\phi}{dx} \quad (5)$$

where

ψ = electrostatic potential

e = electrical charge

ϵ_r = relative permittivity

ϵ_0 = vacuum permittivity

N_D = charged impurities of donor

N_A = acceptor charged impurities

ρ_p = holes distribution

ρ_n = distribution of electrons

R = rate of recombination

J_p = hole current densities

J_n = electron current densities

G = generation rate

The material and device details simulated are summarized in Table 1. The device configuration is metal/p-CZTS/n-CdS/i-ZnO/metal. The detailed schematic diagram of the device is shown in the Figure 3. The device later is simulated under light at AM 1.5G spectrum.

Table 1: Material and device details

Parameter	CZTS	CdS	ZnO	ZnO:Al
Thickness (nm)	100 – 1000	50	80	450
Bandgap (eV)	1.5	2.4	3	3.3
Electron affinity (eV)	4.5	4.4	4.5	4.52
Permittivity	10	9	9	9
N_C density of states ($1/\text{cm}^3$)	$1.0\text{E}+19$	$1.0\text{E}+19$	$1.0\text{E}+19$	$1.0\text{E}+19$
N_V density of states ($1/\text{cm}^3$)	$1.0\text{E}+19$	$1.0\text{E}+19$	$1.0\text{E}+19$	$1.0\text{E}+19$
Electron mobility (cm^2/Vs)	$5.0\text{E}+1$	$5.0\text{E}+1$	$5.0\text{E}+1$	$5.0\text{E}+1$
Hole mobility (cm^2/Vs)	$5.0\text{E}+1$	$5.0\text{E}+1$	$5.0\text{E}+1$	$5.0\text{E}+1$
Donor concentration ($1/\text{cm}^3$)	0	$1.0\text{E}+17$	$1.0\text{E}+18$	$1.0\text{E}+19$
Acceptor concentration ($1/\text{cm}^3$)	$1.0\text{E}+16$	0	0	0

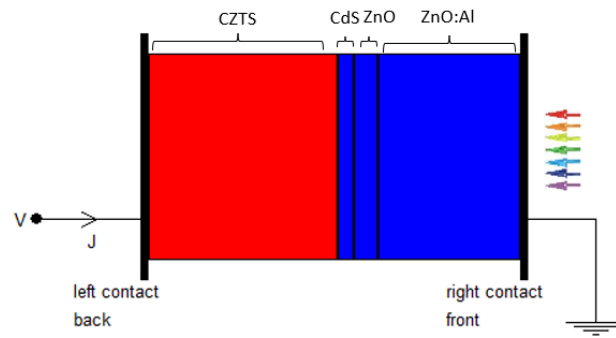


Figure 3: Device configuration

3. RESULTS AND DISCUSSION

The simulated results are presented and discussed in this section. In Figure 4, the simulated band diagram shows successful quasi-fermi level splitting under illumination of AM 1.5G spectrum. The splitting confirms displacement of electron-hole populations from equilibrium due to exposure of light. A pn-junction could be seen formed at the interface between p-CZTS and n-CdS at thickness of 1.0 μm . Formation of pn-junction is crucial in order to get a working device with acceptable efficiency.

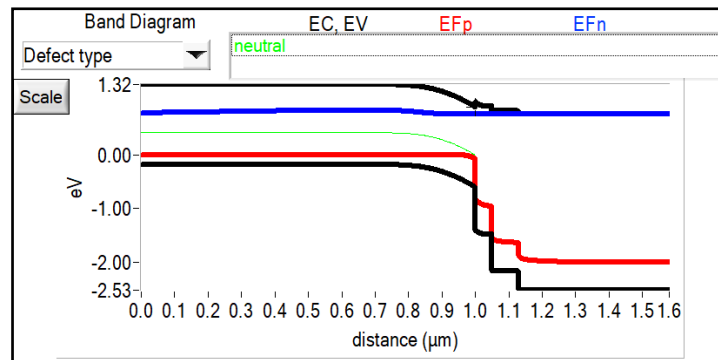
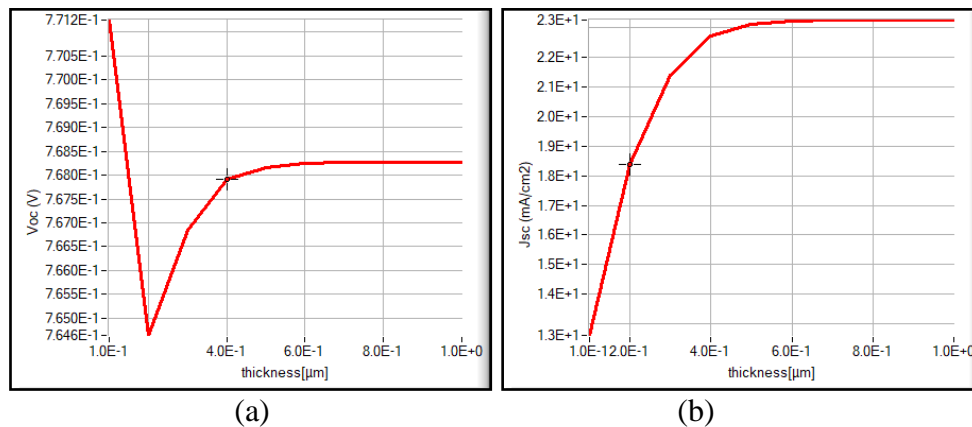


Figure 4: Simulated band diagram



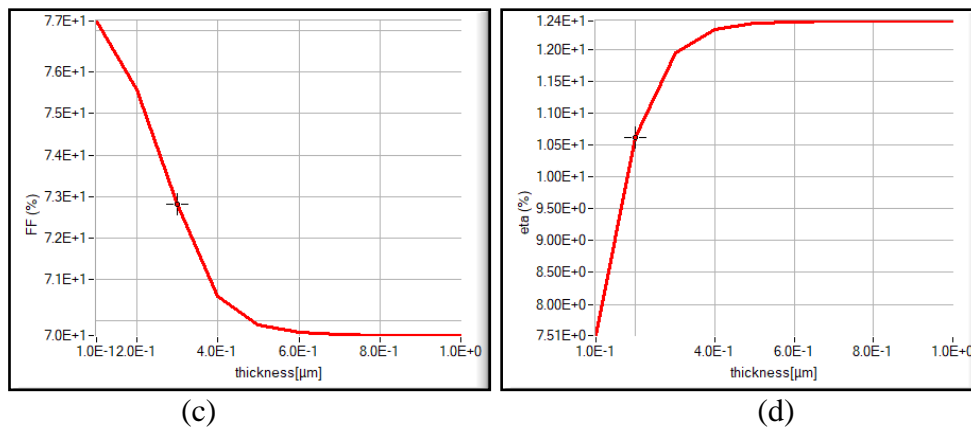


Figure 5: Simulated (a) V_{oc} (b) J_{sc} (c) FF (d) PCE as a function of thickness

Figure 5 shows photovoltaic parameters V_{oc} , J_{sc} , FF and PCE of CZTS solar cell as a function of thickness. V_{oc} is found to increase above 200 nm up to 600 nm. Similar trend could be seen in J_{sc} whereby the value increases when thickness is increased. A thicker absorber could absorb more photons per unit volume, thus generating more electron-hole pairs [8]. However, this increase reaches saturation level onset at 600 nm absorber thickness. The FF is found to be reduced when thickness is increased. Overall, it has been found that the optimum thickness of the absorber is 600 nm which gives $J_{sc} = 23.215341 \text{ mA/cm}^2$, $V_{oc} = 0.7681 \text{ V}$, and FF = 69.75 %. A maximum PCE of 12.44 % is extracted for this device.

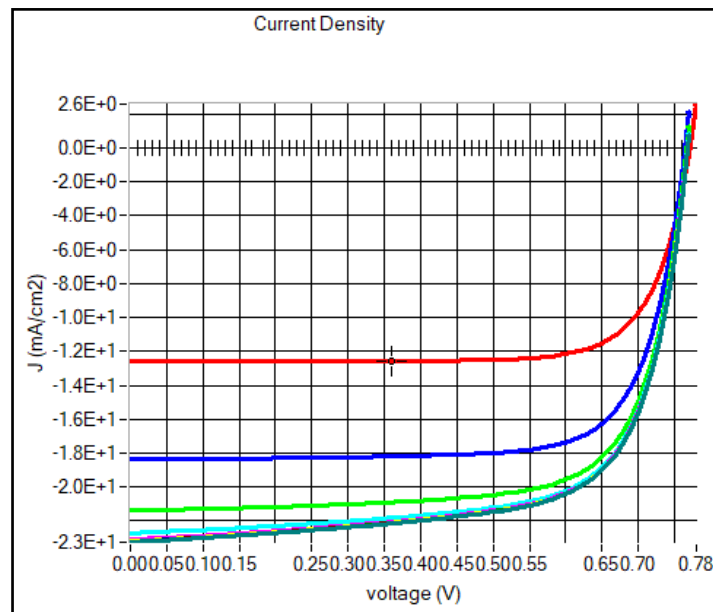


Figure 6: J-V characteristics of simulated cells

The J-V characteristics of all simulated cells are shown in Figure 6. It can be deduced that illumination of light could shift the J-V curve down to fourth quadrant. This implies that power could be extracted from the diode thus confirms a working solar cell is successfully simulated.

4. CONCLUSION

In this study, performance of chalcogenide, i.e. CZTS based solar cells have been investigated from numerical simulation perspective. With the aim to optimize the thickness of absorber layer, the findings indicate that the cell is working at maximum efficiency of 12.44% when the thickness is 600 nm. This finding is beneficial prior to realizing a real cell fabricated in the laboratory to save cost and time.

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INFORMATION TECHNOLOGY, ENGINEERING AND MATHEMATICS

I-CReST 2022:077-041 - Application of Moving Average Models for Forecasting Temperature and Wind Speed

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ABSTRACT

Temperature and wind speed predictions are important components of temperature forecasting. There are several complex approaches and advanced technologies that have been proposed. This study has proposed a simpler approach of forecasting. The objectives of this study are to form a prediction model for predicting the trend of temperature and wind speed using a moving average method and to identify the best model based on errors to use in forecasting temperature and wind speed. Moving average applied in this research is calculated with a delay of a few days to determine the average and estimate the predicted value. There are three types of period moving average used and two models are tested for each temperature and wind speed. By using the moving average, the 5 days' model is the best model to forecast temperature since it has modest changes in value between the actual and predicted values and has smaller errors. Wind speed is one of the most difficult things to predict. Thus, the ideal method is to determine the average wind speed for a short period of time. The 3 days' model is the best for wind speed since it has less errors and more days of data with the precise value between actual and forecasted wind speed. The findings have shown that it is possible to use a simple mathematical approach and apply it to forecast weather for a specific time and place.

Keywords: Temperature; wind speed; moving average

1. INTRODUCTION

Temperature and wind speed are two meteorological components that change on a daily basis. If it fluctuates significantly it can tell a distinct story about the weather where the changes may have a negative impact on the weather in certain areas. Forecasted weather components are significant since they may assure life safety and can be used to plan activities around these occurrences as well as prepare for the upcoming disasters and survive them (Biswas et al., 2018). Every component of the weather is recorded and forecasted in order to predict the upcoming weather. Data can be obtained from a variety of sources involving complicated process analysis and computing. The data may be imprecise, but it is much better than forecasted data from many years ago. However, there are only a few basic and easy forecasting approaches have been applied as it more focusing on Artificial Intelligence methods (AI). Hence, in this study a moving average method will be used to forecast temperature and wind speed. There are three types of period moving average used and two models are tested for each temperature and wind speed. The objectives of this study are to form a prediction model for predicting the trend of temperature and wind speed using a moving average method and to

identify the best model. Moving average used in this study is a simple and easy method to calculate for a period of time.

The moving average method is an approach for calculating the average of several time periods and analyzing the trend. This method has been utilized in many fields of forecasting especially in finance field. The best short-term moving average is up to 20 periods, while the best long-term moving average is 100 or more than 100 periods. Various studies have utilized this approach to forecast as it has many strengths and limitations. There are many types of moving average has been used in forecasting and the most popular models is an Autoregressive Integrated Moving Average, ARIMA and many studies has compared the results to other models (Narasanov, 2018). There are several studies have shown that moving average has given more accurate results like (George, 2018) has presented the ARIMA model and the method can be proven by Box-Jenkin ARIMA model, it can help to predict weather changes in the future. The study also mention it is possible to forecast the evolution of the temperature by using past data although it only valid for a short time period and the result can be uncertain.

Forecasting wind speed may also be difficult since the value might varies for the same weather on the same day. Wind speed forecasting is vital since wind power is dependent on it. To achieve an accurate estimate of forecast wind speed, it is necessary to have as much specific information about the wind patterns of the location, as well as local and regional climates as feasible (Shao et al., 2021). Nonetheless, when compared to the reference persistence model, the results from moving average models have shown substantial improvement, achieved significant small errors, and provide better results at a longer time ahead (Abdelaziz, 2015). In addition, (Krishna, 2015) also has shown the proposal was capable of forecasting weather using moving average models after accounting for differences attributes that are important in weather prediction. There are also other findings by (Jamdade, n.d.) stating that 3 month weighted moving average offers optimal accuracy in wind speed forecasting than 3 month moving average as it provides more accurate volatility estimations.

Nevertheless, moving average approaches can be proven useful for forecasting temperature and wind speed. Previous research has shown that proposed models and approaches can enhance predicting outcomes by identifying and adjusting temperature and wind speed inaccuracy. The study might employ the quality measure to evaluate the reliability of the proposed approach. Finally, temperature and wind speed are required to estimate the upcoming weather which is significant since it may be used as a preventative strategy to avert natural catastrophes and to assist those who rely on these natural resources for a living. Thus, it is necessary to forecast temperature and wind speed ahead of time.

2. METHODOLOGY

In this study, the historic value was required to assess and estimate the data information using the moving average. The historical statistics from March 2022 are accessible on the authorities' website. A month's sample of data is collected and analyzed to forecast temperature and wind speed for the next month.

A simple forecasting method is to simply average the latest few observed values of a time series (Hyndman, 2011). The general equation of moving average is

$$\hat{y}_{t+1} = \frac{y_t + y_{t-1} + \dots + y_{t-m+1}}{n} \quad (1)$$

The study has decided to use 5 days and a 10 day moving average for the model temperature and a 3 day and a 10 for the model wind speed. In order to obtain the model in predicting the future values of temperature and wind speed modelling the moving average method will be done. The model formed will contain the past value that are from previous month and the predicted value for the next period will be the future values. Then, the final stage the values of actual and predicted are compared and the error from each model is analyzed. This study is intending to predict for one month of April. Thus, the model need to be constructed to predict a few days backward from the modelling of 30 days.

This is an important stage since it determines the future value of temperature and wind speed. To reduce errors, the experiment was carried out during the forecasting process for both models that were generated. In the moving average model, varied number of days were employed to compute potential values as accurately as feasible. As a result, the study decides to apply the 3 days moving average in the wind speed model since it has a more accurate predicted value and a smaller error than the 5 days moving average. After thoroughly computing the approximation value of both temperature and wind speed based on their basis model, the trend line pattern would be formed and could be used with the actual data for the forecasting month to continue the forecast model evaluating process.

After generating the estimated data for the following period, the data must be compared between the estimated data and the exact value. The estimated data may differ from the real data and contain errors in the calculation. This study employs three forms of error measurements which are MAE (mean absolute error), MSE (mean square error) and MAPE (mean absolute percentage error). MAPE error is represented as a percentage. The following is the formula for measuring all errors involved:

$$MAE = \frac{1}{N} \sum_{i=1}^N (Y - y) \quad (2)$$

$$MSE = \frac{1}{N} \sum_{i=1}^N (Y - y)^2 \quad (3)$$

$$MAPE = \frac{1}{N} \sum_{i=1}^N \left| \frac{Y - y}{Y} \right| \times 100\% \quad (4)$$

Y = Exact value

y = Predicted value

There are two models that need to compare and chosen to be the fit model which is 5 days and a 10 day moving average for the model temperature and a 3 day and a 10 for the model wind speed. Thus, the two model of forecast value need to compare with the exact value in order to analyse the accuracy of the values. Then, calculate the error between forecast and exact value using MAE (mean absolute error), MSE (mean square error) and MAPE (mean absolute

percentage error) MAPE error. The model with the smallest errors is chosen as the fit model and it is a valid model for predicting temperature and wind speed for the next period.

3. RESULT AND DISCUSSION

Based on the methodology explained in the previous section. The research includes two temperature and wind speed modelling projections based on different days of moving average. A 5 day and a 10 day moving average used for the model temperature, and a 3 day and a 10 day moving average will be used for the model wind speed. Two types of gap days were conducted to identify which model produced the most precise results.

3.1 Temperature Forecasting for the 5 and 10 Day Moving Averages

The 5 -day moving average calculated using the moving average method. The equations below show a 5-day delay in predicting the temperature in April. Thus, the equation is

$$\hat{y}_{t+1} = \frac{y_t + y_{t-1} + \dots + y_{t-m+1}}{5}$$

Table 1: Prediction temperature with error based on moving average. Moving average for 5 days.

March	Actual value	Predicted value	MAE	MSE	MAPE
1	32	32.2	0.2	0.04	0.63%
2	33	32.4	0.6	0.36	1.82%
3	33	32.8	0.2	0.04	0.61%
4	31	32.6	1.6	2.56	5.16%
5	31	32	1	1	3.23%
6	30	31.6	1.6	2.56	5.33%
7	32	31.4	0.6	0.36	1.88%
8	31	31	0	0	0.00%
9	33	31.4	1.6	2.56	4.85%
10	33	31.8	1.2	1.44	3.64%
11	32	32.2	0.2	0.04	0.63%
12	34	32.6	1.4	1.96	4.12%
13	33	33	0	0	0.00%
14	33	33	0	0	0.00%
15	33	33	0	0	0.00%
16	32	33	1	1	3.13%
17	33	32.8	0.2	0.04	0.61%
18	32	32.6	0.6	0.36	1.88%
19	34	32.8	1.2	1.44	3.53%
20	33	32.8	0.2	0.04	0.61%
21	33	33	0	0	0.00%
22	34	33.2	0.8	0.64	2.35%
23	34	33.6	0.4	0.16	1.18%

24	34	33.6	0.4	0.16	1.18%
25	35	34	1	1	2.86%
26	34	34.2	0.2	0.04	0.59%
27	35	34.4	0.6	0.36	1.71%
28	36	34.8	1.2	1.44	3.33%
29	34	34.8	0.8	0.64	2.35%
30	35	34.8	0.2	0.04	0.57%
31	33	34.6	1.6	2.56	4.85%

Table 1 shows the temperature forecast result using a three-day moving average. There are 31 days of exact temperature in March, predicted temperature, and forecast error using three types of error measurements. According to the table, there are 5 days where the error value is 0, indicating that the predicted value matches the actual value precisely. The other days similarly showed a slight inaccuracy of less than 5%.

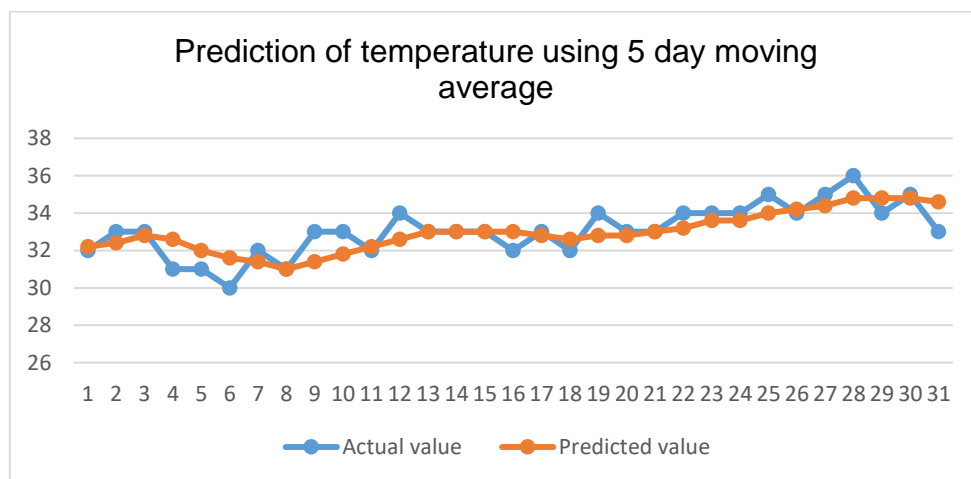


Figure 1: Prediction of temperature using 5 day moving average

The graph above depicts the actual value of temperature in March 2022 and the expected value of temperature in March 2022. There are ten days when the predicted temperature is higher than the actual temperature. The other predicted temperature value is smaller than the exact value, and 5 days have the same value as the exact temperature. It may also be seen that there are modest gaps between the exact and predicted temperature.

The 10-day moving average is calculated using the moving average method. The equations below show a ten-day delay in predicting the temperature in April. Thus, the equation is

$$\hat{y}_{t+1} = \frac{y_t + y_{t-1} + \dots + y_{t-m+1}}{10}$$

Table 2: Prediction temperature with error based on moving average for 10 days' forecast

Mar	Max/actual	Predicted value	MAE	MSE	MAPE
1	32	32.4	0.4	0.16	1.25%
2	33	32.4	0.6	0.36	1.82%
3	33	32.3	0.7	0.49	2.12%
4	31	32	1	1	3.23%
5	31	31.7	0.7	0.49	2.26%
6	30	31.9	1.9	3.61	6.33%
7	32	31.9	0.1	0.01	0.31%
8	31	31.9	0.9	0.81	2.90%
9	33	32	1	1	3.03%
10	33	31.9	1.1	1.21	3.33%
11	32	31.9	0.1	0.01	0.31%
12	34	32	2	4	5.88%
13	33	32	1	1	3.03%
14	33	32.2	0.8	0.64	2.42%
15	33	32.4	0.6	0.36	1.82%
16	32	32.6	0.6	0.36	1.88%
17	33	32.7	0.3	0.09	0.91%
18	32	32.8	0.8	0.64	2.50%
19	34	32.9	1.1	1.21	3.24%
20	33	32.9	0.1	0.01	0.30%
21	33	33	0	0	0.00%
22	34	33	1	1	2.94%
23	34	33.1	0.9	0.81	2.65%
24	34	33.2	0.8	0.64	2.35%
25	35	33.4	1.6	2.56	4.57%
26	34	33.6	0.4	0.16	1.18%
27	35	33.8	1.2	1.44	3.43%
28	36	34.2	1.8	3.24	5.00%
29	34	34.2	0.2	0.04	0.59%
30	35	34.4	0.6	0.36	1.71%
31	33	34.4	1.4	1.96	4.24%

Table 2 displays the results of a 31-day prediction using a moving average. The actual and forecasted temperatures are shown in the table. It also contains three different types of error measurement for the 10-day forecast error. There is just one 1-day forecast with the same value as the actual temperature value. There is also one error that exceeds 5%.

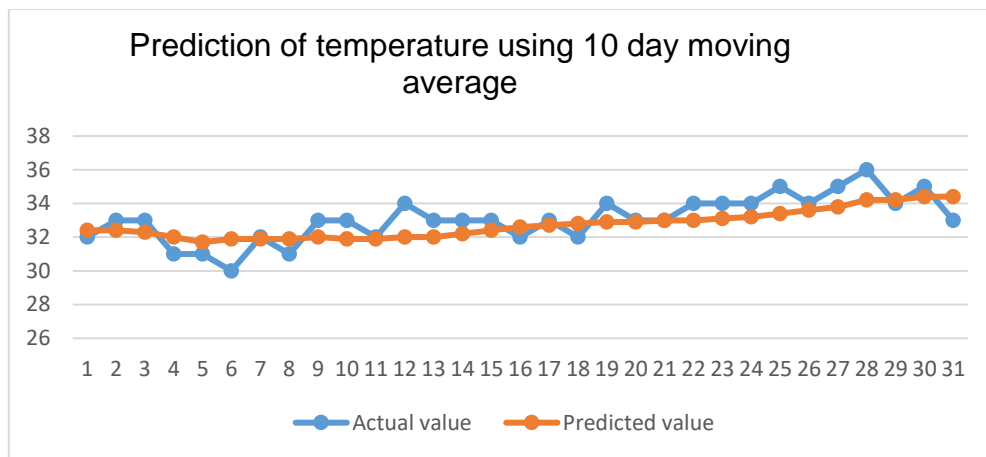


Figure 2: Prediction of temperature using 10 day moving average

The graph above illustrates the actual temperature in March 2022 as well as the predicted temperature in March 2022. There are 9 days when predicted value is greater than the exact temperature value. When comparing to the model for 5 day moving average, this model difference between the actual and predicted value is larger.

3.2 Wind Speed Forecasting for the 3 and 10 Day Moving Averages

The 3 -day moving average is calculated using the moving average method. The equations below show a 3-day delay in predicting the temperature in April. Thus, the equation is

$$\hat{y}_{t+1} = \frac{y_t + y_{t-1} + \dots + y_{t-m+1}}{3}$$

Table 3: Prediction and Error of Wind Speed

Mar	Actual value	Predicted value	MAE	MSE	MAPE
1	17	17	0	0	0.00%
2	15	16	1	1	6.67%
3	19	17	2	4	10.53%
4	15	16.33	1.33	1.78	8.89%
5	17	17	0	0	0.00%
6	11	14.33	3.33	11.11	30.30%
7	19	15.67	3.33	11.11	17.54%
8	11	13.67	2.67	7.11	24.24%
9	13	14.33	1.33	1.78	10.26%
10	19	14.33	4.67	21.78	24.56%
11	11	14.33	3.33	11.11	30.30%
12	19	16.33	2.67	7.11	14.04%
13	13	14.33	1.33	1.78	10.26%
14	11	14.33	3.33	11.11	30.30%
15	11	11.67	0.67	0.44	6.06%
16	11	11	0	0	0.00%
17	15	12.33	2.67	7.11	17.78%
18	15	13.67	1.33	1.78	8.89%

19	11	13.67	2.67	7.11	24.24%
20	11	12.33	1.33	1.78	12.12%
21	11	11	0	0	0.00%
22	11	11	0	0	0.00%
23	11	11	0	0	0.00%
24	15	12.33	2.67	7.11	17.78%
25	11	12.33	1.33	1.78	12.12%
26	13	13	0	0	0.00%
27	17	13.67	3.33	11.11	19.61%
28	19	16.33	2.67	7.11	14.04%
29	20	18.67	1.33	1.78	6.67%
30	15	18	3	9	20.00%
31	17	17.33	0.33	0.11	1.96%

The results of a 31-day forecast using a moving average are shown in Table 3. The table shows the actual and expected temperatures. It also includes three forms of error measurement for the 3-day prediction error. There are 14 days with predicted wind speed that exceeds the precise number of wind speed. Aside from that, there are 7-day wind prediction with the same value as the actual wind value.

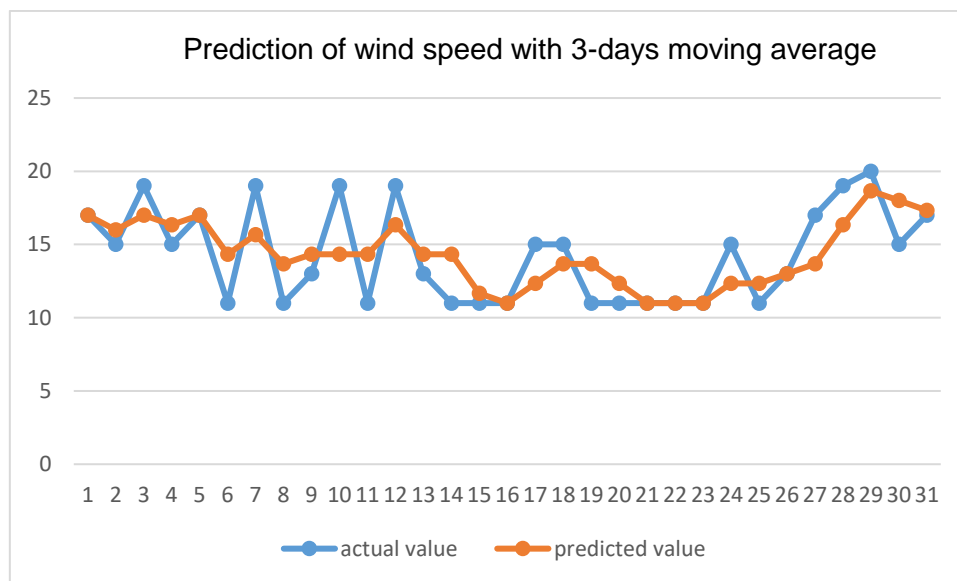


Figure 3: Prediction of wind speed with 3-days moving average

Based on the figure above, it can be seen the gap between the actual and predicted value of wind speed is small.

The 10 -day wind speed forecasting is calculated using the moving average method. The equations below show a 10-day delay in predicting the wind speed in April. Thus, the equation is

$$\hat{y}_{t+1} = \frac{y_t + y_{t-1} + \dots + y_{t-m+1}}{10}$$

Table 4: Prediction and Error of Wind Speed

Actual value	Predicted value	MAE	MSE	MAPE
17	17.1	0.1	0.01	0.58%
15	17.3	2.3	5.29	13.29%
19	17.7	1.3	1.69	7.34%
15	17.5	2.5	6.25	14.29%
17	16.8	0.2	0.04	1.19%
11	16.6	5.6	31.36	33.73%
19	16.5	2.5	6.25	15.15%
11	15.9	4.9	24.01	30.82%
13	15.7	2.7	7.29	17.20%
19	15.6	3.4	11.56	21.79%
11	15	4	16	26.67%
19	15.4	3.6	12.96	23.38%
13	14.8	1.8	3.24	12.16%
11	14.4	3.4	11.56	23.61%
11	13.8	2.8	7.84	20.29%
11	13.8	2.8	7.84	20.29%
15	13.4	1.6	2.56	11.94%
15	13.8	1.2	1.44	8.70%
11	13.6	2.6	6.76	19.12%
11	12.8	1.8	3.24	14.06%
11	12.8	1.8	3.24	14.06%
11	12	1	1	8.33%
11	11.8	0.8	0.64	6.78%
15	12.2	2.8	7.84	22.95%
11	12.2	1.2	1.44	9.84%
13	12.4	0.6	0.36	4.84%
17	12.6	4.4	19.36	34.92%
19	13	6	36	46.15%
20	13.9	6.1	37.21	43.88%
15	14.3	0.7	0.49	4.90%
17	14.9	2.1	4.41	14.09%

Table 4 displays the actual and forecasted wind speed values. The table includes error measures to estimate the precision of the predicted wind speed. The results reveal that no predicted value has the same value as the actual wind speed. The error also shows a significant difference between the real wind speed and the predicted wind speed.

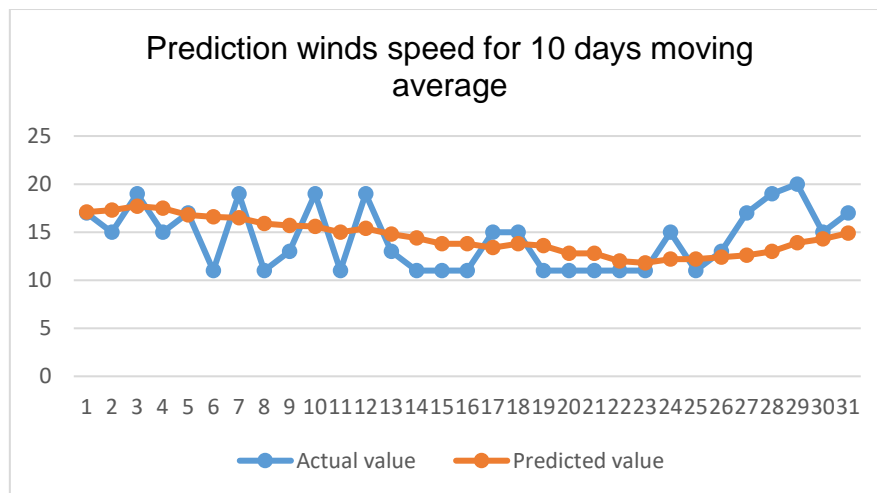


Figure 4: Prediction of wind speed with 10-days moving average

Figure 4 depicts a line of actual and expected wind speeds in April 2022. The real line on the graph is more dispersed than the projected value. As can be observed, there is a significant variation in value between the two lines.

3.3 Choosing the Best Model Based on Error Measurement of MAE, MSE and MAPE

Comparing error after obtaining prediction errors is required to select the optimal model. For temperature and wind speed, the models are derived using three error methods which are Mean Absolute Error, Mean Square Error, and Mean Absolute Percentage Error.

Table 5: Mean Absolute Error of Temperature and Wind Speed

Error of Temperature			Error of Wind Speed		
5 days moving average			3 days moving average		
MAE	MSE	MAPE	MAE	MSE	MAPE
0.6645	0.7368	2.02%	1.73	4.74	12.23%
10 days moving average					
0.8290	0.9571	2.50%	2.5355	9.0058	17.62%

The table above shown the result of error for two model for temperature and wind speed for two model. The summation of the error can be compared to see which model has the best result and small error.

4. DISCUSSION

This research implemented three types of period moving averages which are three, five, and ten days moving averages. In this study, 5 days moving averages were utilised since they are among the periods that provide the precise fit and are suited for short-term trends. The 10 day moving average is a well-known period in the past since it is simple to compute. In this study 10 days moving average is also used to assess whether a short or longer time has provided better results. However, the longer the moving average the greater the lag. Furthermore, using only 31 days on this study improves accuracy when the moving average is at a small interval.

In comparison for situations in wind speed, 3 days moving average used in this study has greater precision and more data has the precise value of actual temperature and predicted temperature compared to 5 days and 10 days moving average.

The projected temperature and wind speed using moving average are displayed in Table 5. There are two models in use which are temperature using a 5 day moving average and temperature using a 10 day moving average. Meanwhile, wind speed is calculated using a three-day and ten-day moving average.

Based on the errors, the temperature model with 5 days moving average is the best model for predicting. When compared to the model 10 days, the errors of this model have a smaller interval. This assumption is further supported by the fact that the greater the number of Mean Square Errors, the greater the mistake in the model.

For the wind speed, Model 3 days moving average is the best model for forecasting wind speed since it has the lowest total error. There is a significant difference in inaccuracy between the two models. Using this model, it was discovered that only a few forecast data had the same exact value as the real value, as opposed to the model 10 days moving average, which did not have any same predicted value as the actual value. The wind speed has been high for several days, although it is still within the predicted range.

5. EQUATIONS

$$\hat{y}_{t+1} = \frac{y_t + y_{t-1} + \dots + y_{t-m+1}}{n} \quad (1)$$

$$MAE = \frac{1}{N} \sum_{i=1}^N (Y - y) \quad (2)$$

$$MSE = \frac{1}{N} \sum_{i=1}^N (Y - y)^2 \quad (3)$$

$$MAPE = \frac{1}{N} \sum_{t=1}^N \left| \frac{Y - y}{Y} \right| \times 100\% \quad (4)$$

6. CONCLUSION

Weather forecasting is important since it may benefit in human life and activities yet weather forecasting is difficult to formulate statistically although various studies have been proposed with variety approaches. Forecasting can be more difficult especially in locations with seasonal weather because it involves different meteorological components that are all interconnected. Many factors can impact the temperature and wind speed forecasted in this study. Despite these challenges, this study was able to analyse and forecast temperature and wind speeds using moving averages of 3, 5, and 10 days. The results are validated by the RMSE (root mean square error), MAE (mean absolute error) and MAPE (mean absolute percentage error) from two different datasets. The findings revealed a fit result where the 5 days' model is the best model to forecast temperature since it has modest changes in value between the actual and predicted values and has smaller errors. The 3 days' model is the best for wind speed since it has less

errors and more days of data with the precise value between actual and forecasted wind speed. This approach might generate a variety of models based on different day averages. After all, when the number of days' increases, it will become more hard to conduct and apply specifically in wind forecasting.

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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I-CReST 2022:101-172 - Enhancement of Phishing Sites Detection Using Hybrid Machine Learning Technique in Weka

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ABSTRACT

Cybercrime is becoming more prevalent by the day. Phishing is one of the methods used to commit fraud and obtain personal information from victims. Various phishing detection technologies and simulations have been developed, with machine learning has been contributed in some of them. However, the effectiveness of using hybrid machine learning techniques for phishing detection is still limited. Therefore in our proposed method, we tried to combine J48, Bagging and Support Vector Machine (SVM) as the technique to increase the percentage of phishing detection. Weka is the platform used to generate this method as it is stable and contain a lot of data mining-related machine learning methods. The J48 algorithm is used to choose the best features, along with various types of evaluators, while Bagging and SVM algorithms are utilised as the combined classifiers. The chosen features from J48 were then employed in Bagging together with Lib Linear, a type of SVM classifiers to see which combination would give the best phishing detection accuracy. J48 is the algorithm that contributed the most in the development of the proposed method since it has a higher prediction accuracy and more accurately classified occurrences. As a consequence, using J48 as a feature extraction evaluator was beneficial to this experiment. Using the same number of datasets as previous work (10,000), the results showed that the suggested strategy outperformed existing work by 96.27 percent. However, development of this proposed methodology can be continuously improved as attackers would generate additional phishing URLs to fake the original website.

Keywords: Phishing; J48; Support Vector Machine (SVM); machine learning; feature extraction; classifier

1. INTRODUCTION

Phishing is the most common crime reported in 2020, relative to other crimes registered in that year [7]. To ensure that this problem can be minimised, various of anti-phishing solutions have been developed. These tools were created using a variety of elements such as URLs, wordlists, HTML, social networking, graphics, and many more [5]. Many methods had been explored to support these features. However, using multiple features without analysing them may result in user drawbacks [3] [10]. Users may become susceptible as the result of the action because harmful software can be downloaded from phishing sites.

Author of [17] presented the multi-model ensemble technique to detect phishing sites in mobile devices. This method integrated deep and supervised learning, resulting a high level of accuracy in detecting phishing sites. However, there are several drawbacks in adopting the deep learning which may have an impact on performance. According to research conducted by [8], deep learning requires a large amount of data and processing time to work well. Furthermore,

the result achieved using this method may be overfitting. This suggests that the data's accuracy could also be threatened. According to [15], the employment of a hybrid machine learning model in any application will improve performance. Regardless, the algorithm chosen should be acceptable for the dataset used. As a result, we believe that several enhancements from the hybrid strategy can help in improving the accuracy of phishing detection. The goal of our suggested method is to improve the accuracy of phishing detection by employing a hybrid machine learning algorithm.

This research focuses on the study of phishing detection and how to improve phishing detection, which will help in detecting phishing sites accurately. Furthermore, it will only concentrate on using machine learning to distinguish between phishing and legitimate websites. Hence, no application will be developed. Two different types of machine learning algorithms will be used to extract and classify the information. The algorithms will be chosen based on their efficiency and benefits in extracting and classifying data in to achieve the best results. The goal of this study is to improve the accuracy phishing detection and the dataset used is from the same source as in [17], ensuring that this method is compatible and significant.

The following sections are organized as follows: Section 2 will summarize the related work of phishing and machine learning. Then the proposed method is presented in Section 3. Section 4 will discuss about how the experiment is conducted and the result obtained from the proposed method. Section 5 will discuss the overall analysis of the experiment. Lastly, the overall project and future work are concluded in Section 6.

2. RELATED WORKS

Machine learning is a technique that allows a model to make decisions based on previous data and learnings. It is divided into various categories, which depends on the research conducted. In order to understand deeper about machine learning, several solutions that has been proposed by previous researchers have a broad idea about phishing detection.

2.1 Machine Learning in Phishing Detection

It has been proven that supervised learning can detect phishing with high accuracy. However, this could be due to the small dataset they used [11]. In other circumstances, depending on the attributes we chose, it may result in low accuracy linkages [9]. The results of both strategies are fairly substantial especially the semi-supervised learning technique, which prioritises spam and rejects the correctness of the entire output [13].

Deep learning is a popular method used by researchers to detect phishing in their methodologies. The most extensively used deep learning algorithm is the convolutional neural network (CNN). CNN has been shown to obtain all of the information required for phishing site classification from the provided URL [14]. It is also used to deliver warnings using the plugin's voice, text, and colour, which can show the level of safety on any website [1]. However, because deep learning is an experiential learning algorithm, identifying the features extracted by the algorithm that is used to make deductions might be difficult.

Author of [16] discovered that the algorithm used in their method can be combined with Meta learners to determine the accuracy of the phishing detection. However, this method had a problem where the Meta learners cannot cooperate with the algorithms as it works

independently. The solution of this problem might be solved if they conduct decision making as in [12], which used ten different algorithms in parallel training and testing models. This method will then go through a decision maker to determine whether the URL is phishing or not. Apart from this solution of using ensembled learning, author of [18] found that the performance on an ensemble stacking model will not increase beyond 2 layers, while author of [17] discovered that the combination of deep learning and supervised learning might not be able to detect shortened URL.

Author of [6] suggested a phishing detection system based on URL extraction from the browser, static URL analysis, HTML extraction, lexical, and third-party based features. Support Vector Machine (SVM) was employed to extract the features for the classification because this approach is claimed to be more exact and works better in the presence of outliers. However, the author of [3], who presented a phishing detection technique using the Mozilla Firefox extension, reported that SVM only works on a few thousand data samples and that their dataset is not supported. As the result, they employed Logistic Regression to categorise the legitimate and phishing websites because it is a scalable classification technique that makes no assumptions about the distribution of feature values. Both techniques only used machine learning for classifying the extracted data.

Meanwhile, author of [17] proposed a phishing detection system using combination of deep learning and supervised learning. They employed the Long Short Term Memory (LSTM) technique to extract all of the URL features and classify them using the Support Vector Machine (SVM), which is a supervised machine learning algorithm. SVM is used as the classifier since it outperformed well than others.

The author of [3] and [10] proposed a method to extract source-code based properties from web pages to detect phishing web pages. Despite the fact that these techniques have a high detection rate, there are possibility of downloading harmful software into mobile devices while extracting the source code of suspicious websites. The author of [17] defend this occurrence, claiming that their approach can simply extracts features from URLs. Besides, using third-party services for feature extraction, such as [6], could hinder the process. It is the same as employing external technologies like Optical Character Recognition (OCR), which can have an impact on detecting capability.

In summary, most researchers used single machine learning technique to detect phishing such as Support Vector Machine, Convolutional Neural Network and Linear Regression. However, the capabilities of other machine learning techniques also cannot be disputed, as they also contributed in phishing detection as well.

3. PROPOSED WORK

The main objective of this proposed work is to enhance the previous work of phishing detection, by using J48, Bagging and Support Vector Machine (SVM) algorithms. J48 is used to generate the model and extract the features. This features then will be classified using the combination of Bagging and SVM to predict either the data used are legitimate or phishing.

3.1 J48 Algorithm

J48 has been used to produce accurate classification results. Hence, it is one of the greatest machine learning algorithms for categorizing and continuously examining data [4]. Besides, J48 has been proved that it will give higher precision and better accuracy in phishing detection compared with other decision tree algorithm [10].

3.2 Bagging and Support Vector Machine (SVM) Algorithm

In the proposed technique, Bagging and SVM are used as classifier to classify the legitimate and phishing URLs based on the features extracted from J48 algorithm. SVM is chosen because it gives high value in terms of accuracy, compared to other Supervised Learning Algorithms [17]. On the other hand, Bagging or Bootstrap Aggregating is an ensemble machine learning method that helps in reducing the overfitting data. The combination of both techniques is predicted in increasing the rate of phishing detection.

3.3 J48-SVM-Bagging

In this method, the hybrid machine learning technique involves two steps. The first step is to test and train the J48 model for feature selection, then generate the two top models which will be used in the second step to be classified. The research framework is illustrated as in figure 1.

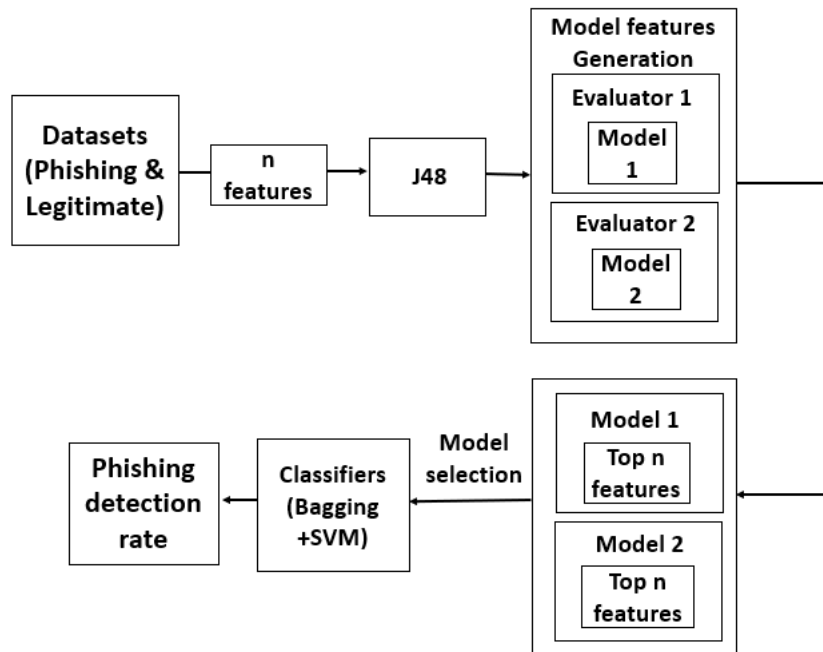


Figure 1: Research framework of proposed method

The extraction of the features will be conducted by using different methods and evaluators, together with J48 algorithm. After the features have been extracted, they will be used as input in the hybrid technique of Bagging and Support Vector Machine (SVM) to be classified. For extraction and classification, WEKA will be used as platform since it is one of the free open-source software and easy to be handled.

4. EXPERIMENT AND RESULT

4.1 Feature Selection and Extraction

To get better accuracy in phishing detection, the features of the dataset has been extracted. The dataset given is evaluated to extract the features using J48 model together with different evaluators. Two evaluators are selected to evaluate and extract the data which are Wrapper subset and Classifier Subset. The reason of generating the data by using two different evaluators is to identify which one will give the best constructed data when it is used with selected classifiers in the next step.

4.2 Classifier

After several features have been extracted, then the classifier will be used to classify the data. Bagging and SVM classifiers have been tested together, while cross-validation is preferred as an option method for classifying as it allows the model data to be trained on multiple train-test splits. Lib Linear is used as the representative of SVM algorithm in Weka.

4.3 Result

Two experiments had been conducted by using different model of features and each of them is named E1 and E2. The results of the experiments showed better results of accuracy when combining with different features that has been extracted. Feature extracted by using Classifier Subset performed better than the other experiment as shown in Table 1.

Table 1: Result using different feature extraction and classification

Experiment	Feature Extraction	Classifier		Result Accuracy
E1	Wrapper Subset (J48)	Bagging	SVM LibLinear	95.80
E2	Classifier Subset (J48)			96.27

Based on Figure 2, Bagging and Lib Linear SVM classifiers worked the best when using the feature extracted from Classifier Subset Evaluator.

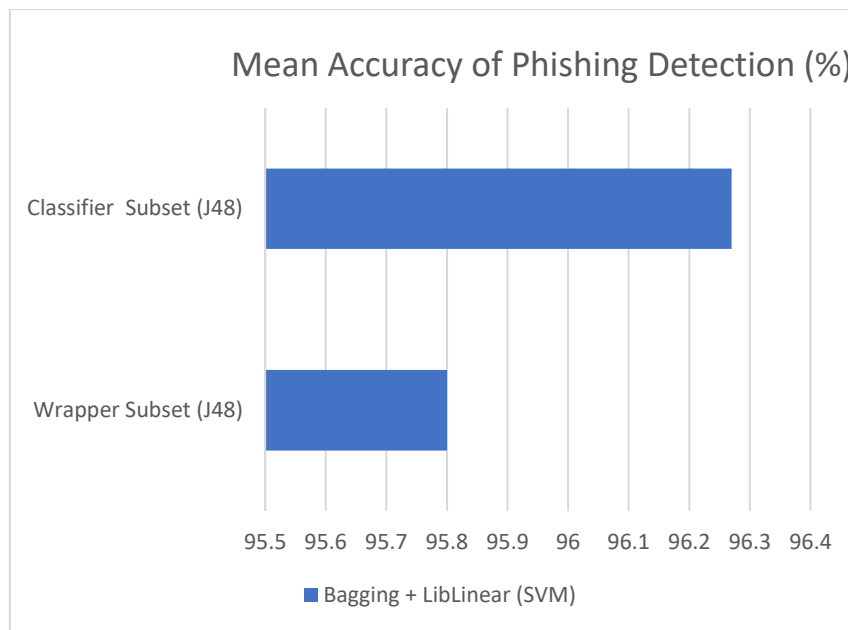


Figure 2: Mean Accuracy of Phishing Detection

5. FINAL ANALYSIS AND DISCUSSION

As has been mentioned in previous section, the portion of the dataset used is 5000 for phishing and 5000 for legitimate sites. The comparison results for each performance matrices for both proposed method and previous work as [17] are shown in Table 2.

Table 2: Comparison Result of performance matrices (based on 10K of datasets)

Metrics	Proposed Work	Rao et al., (2019)
Accuracy	96.27%	95.40%
TPR	0.963	0.952
FPR	0.037	0.044
TNR	0.963	0.955
FNR	0.037	0.048
Precision	0.963	0.954
F-Measure	0.963	0.953

Besides, WEKA also provide the Receiver Operating Characteristics (ROC) curve for the experiment as in Figure 3. The area under ROC curve (AUC) measures how much space is beneath the entire ROC curve. A better performance can be achieved if the AUC of the classifier used is closer to 1.

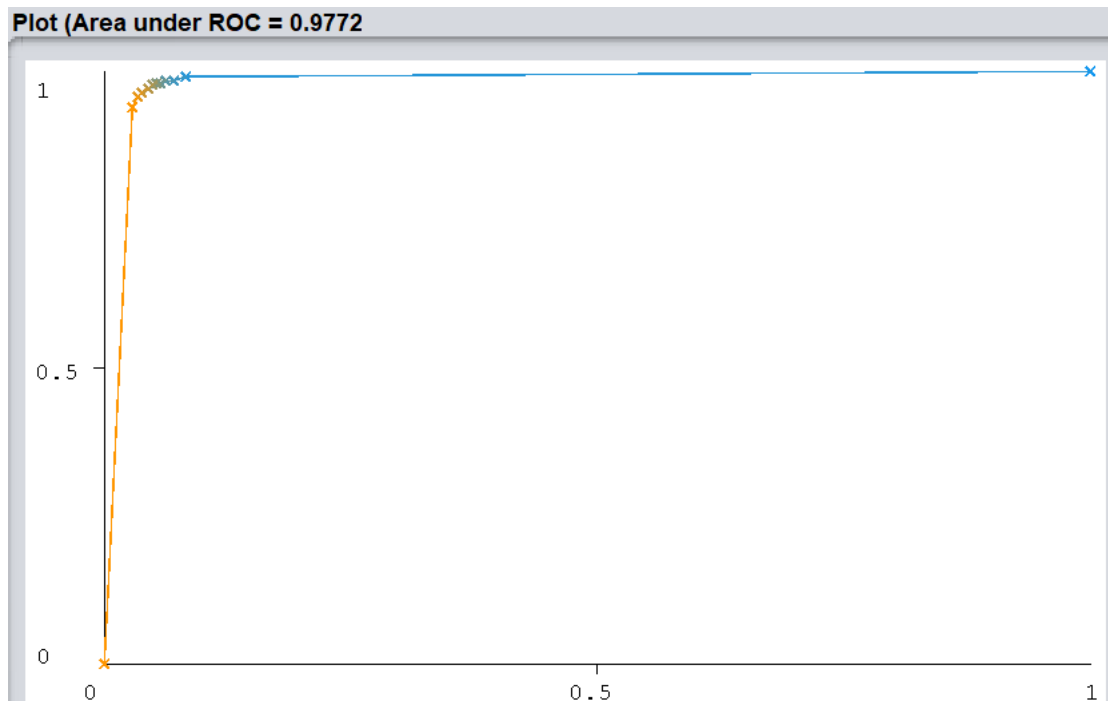


Figure 3: ROC of the model used in the Experiment 2 (E2)

In Figure 3, E2 achieved an AUC of 0.9772, which is considerably closer to 1. This indicates that the performance of this combined algorithm is good. Besides, this experiment beat the experiment conducted by [17], on the same amount of dataset with significant accuracy, F-measure, and AUC, according to comparison result in Table 8. This demonstrates that the proposed hybrid techniques with good feature evaluator and classifiers contributed a greater impact in the classification of phishing and legitimate URLs.

6. CONCLUSION AND FUTURE WORK

6.1 Conclusion

Author of [17] has proposed the multi-model ensemble technique which combined the deep and supervised learning for phishing detection. However, the use of deep learning might affect the performance as it requires a large amount of data and consume much time to process. As the consequences, the result obtained from this technique may be overfitting, and the result might be compromised. Hence, the enhancement of this method is proposed to improve the problem related with the accuracy of phishing detection.

In this proposed technique, the objective has been achieved as the accuracy of phishing detection increases up to 96.27% based on 10,000 of datasets has been used. J48, Bagging and SVM are the algorithm that have contributed for the proposed method. It is proven that Lib Linear SVM Classifier give the highest result of accuracy when combining with Bagging classifier. Besides, Cross Validation method with ten folds also help in giving better result as it gives chances to the data to be trained on multiple train-test splits. Therefore, it is considered as powerful method in machine learning.

Finally, due to advances of technology day by day, the development of this proposed methodology can constantly be enhanced. this is because the manipulation of information in

phishing will be more complex as more phishing URLs will be created by attackers to falsify the original website.

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I-CReST 2022:121-097 - IOT-Based Smart Door Lock System

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ABSTRACT

This paper describes the development of a prototype for an Internet of Things (IoT) and fingerprint-enabled door lock system. The goal of this study is to create a smart door lock system that requires biometric input from users for security while also allowing the admin or owner to grant easy access via smartphone using a registered Adafruit Input Output (IO) account via If This Then That (IFTTT). The system is built around an ESP8266 NodeMCU microcontroller, a 5V relay that controls a 12VDC solenoid, and an R307 fingerprint scanner that scans and stores fingerprint features. The system is tested by scanning fingerprints, both registered and unregistered, to see if it can operate as intended and notify the users via Telegram. Furthermore, by implementing the Adafruit IO, the smartphone can also be used to activate the solenoid lock. It allows users to use a smartphone to open or close the door by pressing and releasing the digital push button in the Adafruit IO feed. The results show that both fingerprint scanner as well as the smartphone can match stored fingerprint features and triggers the solenoid lock respectively. This system can be improved further by incorporating an attendance system to track registered users or by including a display panel in addition to the attendance system.

Keywords: Fingerprint-enabled door lock system; Adafruit IO; If This Then That (IFTTT); ESP8266 NodeMCU

1. INTRODUCTION

Security has emerged as a major concern in the twenty-first century; everyone wants to feel safe in his or her own home, workplace, and overall environment. When residents are away or on the premises, houses and offices, they are vulnerable to security threats. Intruders can gain access to the premises by picking locks or replicating physical keys. Furthermore, in the case of a manual door lock with keys, the probability of key loss may arise, which may cause problems if a person locks himself out of his house. To address this problem, substantial research on smart door lock systems was conducted. Personal identifications such as passwords, Radio Frequency Identification Data (RFID) cards. San Hlaing & San Lwin, (2019), Hasan et al (2020) and Edozie & Vilaka (2020) as well as fingerprint sensor Komol et al (2018) have been implemented using various microprocessors and microcontrollers, such as Arduino, Raspberry Pi and NodeMCU ESP8266 technology for the security of door locks. The system can be implemented in Blynk and Web Application as well as Telegram Application using a variety of wireless communication techniques, including ZigBee, Wi-Fi, Bluetooth (New et al, 2019) GSM and etc.

In Hemalatha & Gandhimathi (2019), an electronic code lock system with an 8051 microprocessor and also an RFID tag and reader for authentication was proposed. The password from the keyboard is sent to the output using One Time Password (OTP) via the Global System for Mobile Communications (GSM) wherein the output is then actuated accordingly. Hasan et al. (2020) created an automatic door lock for the classroom that uses an RFID card to trigger the Arduino Mega 2560 microcontroller. The data was then sent to a server to unlock the magnetic door lock. In the event that intruders are detected, an alert message will be sent to the authorized administrator via the Short Message Service (SMS). However, the implementation of password and RFID card may be unreliable in the sense that the password may be hacked or the access card may be lost. Furthermore, if the password is forgotten and the system does not provide another way to unlock the door, it is unlikely to be opened.

Consequently, Internet of Things (IoT)-based security can play a significant role in improving the safety of residents of a home or office workers. IoT can assist users in remotely managing and monitoring a system through a smart phone via the Internet. Integrating this technology into door security, specifically a door lock, allows for notifications of attempted entries as well as control of the door lock via smartphone if necessary. These implementations can significantly improve quality of life while also informing users if anyone attempts to enter the door. Adiono et al. (2019) created a door lock system comprised of an STM32L100 microcontroller and an Xbee module that communicates with the host of the smart home to use the user's Global Positioning System (GPS) system captured from a mobile application. The system requires the user to be close to the door's GPS coordinates. Nonetheless, the application captures the user's location every 5 minutes, which is quite a long time due to the GPS-based system. Norarzemi et al. (Norarzemi et al, 2019) proposed a smart door system prototype with IoT Application. The system is able to act as a digital door system that controls and monitor the lock using Blynk application. NodeMCU ESP8266, which has an integrated Wi-Fi module is connected to the Blynk server that works as the IoT platform for the prototype.

In view of that, incorporating a biometric scanner is highly desirable. The face is one of the most often utilised biometrics. Facial recognition has gotten a lot of interest because it can collect a face image from a web camera that is installed (Pawar et al, 2018). Radzi et al, (2020) used a deep learning technique to construct a real-time face recognition smart home security system that controlled the door opening automatically. The Raspberry Pi 3 was used in this system, which resulted that the coding required a lengthy time to process the image and unlock the door. Owing to the lengthy time to process the image, Rao in (Rao, 2021) utilized PIR sensor to capture image. Haar Cascade algorithm was developed to provide better computational timer and greater accuracy in detecting and recognizing the human face wherein the image processing rate is around 28 images per second. Face biometrics, on the other hand, presents a research challenge due to position variation, occlusion, various facial expressions, ageing, transformation, and illumination (Bhise et al, 2018). Thus, the implementation of finger print-based biometric is desired as each person has a unique fingerprint feature that cannot be replicated, making it a very secure medium in security systems.

The issue of security motivates the researchers to develop a smart door security system with alert using ESP8266 NodeMCU, biometric fingerprint scanner, cloud service If This Then That (IFTTT) and Adafruit IO feed and smart phone that aims to improve and advance the safety and security of people's lives and property. This manuscript describes the development of an automatic smart door security system particularly for home users and workplace. When indoors or away from your home or workplace, smart door lock is proposed to protect the

individuals as well as premises primarily to grant access to only authorised persons using their registered fingerprint features. Furthermore, the system integrated IoT features, allowing the door lock to be controlled via a smart phone. The following is how this manuscript is organised: Section I provides system background for the proposed system. Section II provides an overview of the system. Section III explains the proposed system, and Section IV presents the results and discussion. Section V summarises the findings and recommendations.

2. SYSTEM DEVELOPMENT

Figure 1 shows the block diagram of the smart door lock system. The system consist of three main components, fingerprint-based biometric scanner to detect the user's finger print, message alert sending system using Adafruit IO via Wifi network, 12V solenoid lock and buzzer.

Referring to Figure 1, the automated controlling system comprises of Fingerprint scanner, ESP8266 NodeMCU, relay channel, Adafruit IO, IFTTT platform, 12V solenoid lock and buzzer. R307 optical fingerprint sensor is proposed to scan fingerprints and send the processed data to ESP8266 NodeMCU via serial communication. This sensor is sensitive and can scan a fingerprint in under a second with 500dpi resolution. The fingerprint reader module stores all of the fingerprints that have been registered. It can store up to 1000 unique fingerprints. The software used are Arduino IDE, Adafruit IO and IFTTT to facilitate the communication between the smart phone and the Adafruit IO in order to manage the door control.

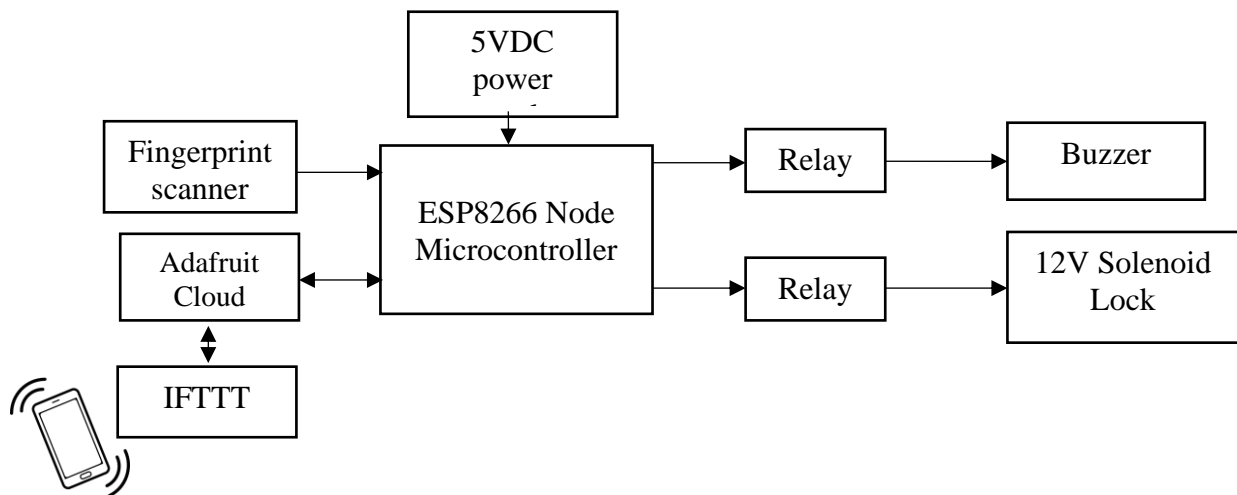


Figure 1: Block Diagram of Smart Door Lock System

The NodeMCU is an open source programming and rigging advancement condition that is based on the ESP-8266, an extremely unobtrusive System-on-a-Chip. The NodeMCU is powered by a 3.3V supply. It is a prototyping board, that works with the Arduino IDE. The NodeMCU switches the device operations linked by a 5V DC Single Pole Double Throw (SPDT) single-relay board based on the inputs. The coil, pallet, and contact are the three components that make up a relay, which operates using electromagnetic induction. The relay's input is the coil component, which is not electrically connected to the pallet or contact part. The relay provides extensive current and voltage control to turn off or on the device without being impacted by the load frequency by applying modest current and voltages.

Solenoids and buzzer act as the system output. Solenoids are essentially electromagnets, consisting of a large coil of copper wire with an armature (a metal slug) in the centre. The slug

is drawn into the centre of the coil when it is electrified. As a result, the solenoid can pull from one end. This particular solenoid is robust and powerful, with a slanted cut slug and a good mounting bracket. In addition, buzzer is used to audibly alert users when a fingerprint scan is activated.

Adafruit IO is useful for storing, viewing, and controlling appliances over internet (Khrisna et al, 2019). It is basically an open source cloud service that can be also be connected over the Internet. The commands are decoded and then sent to the microcontroller. The microcontroller then responds to the command by controlling the relays connected to it. Adafruit works better with IFTTT.

IFTTT is a free cloud computing service that is broadly used for many applications such as smart home automation and monitoring on IoT platform (Shahbaaz, 2019). Its main role is to provide a platform that connects several web services, such as Google, Facebook, and Instagram, allowing them to work together. This type of linked service to connect between two applications or between device and application is also known as Applets. The "this" element of an IFTTT applet is the item that can be used to trigger the Applet, after which the Applet will carry out a command, or action. The "that" element of the IFTTT Applets specifies the action. All of the Applets are the links between the trigger ("this") and the actions ("that"). This Applet will do "that" component when "this" part is activated.

Referring to Figure 2, NodeMCU ESP8266 is powered by a 5VDC power adapter. The NodeMCU ESP8266 is used in this project because it has a Wi-Fi module and is less expensive than an Arduino while performing equally well. The Wi-Fi module is important because without it, a connection to the Internet cannot be established, and thus the device cannot be classified as IoT. Essentially, there will be two inputs: the fingerprint scanner and the Adafruit IO digital input via the smart phone. The output, buzzer and the Normally Opened (NO) 5V relay module, are connected to a 12V solenoid lock. The solenoid lock requires its own power supply, which is a 12VDC battery as the microcontroller is unable to supply such high voltage.

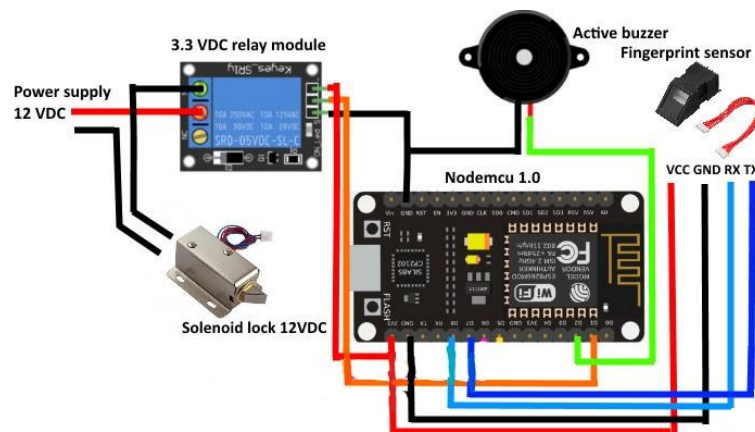


Figure 2: Wiring Diagram of the Smart Door Lock System

Figure 3 shows the flow chart of the smart door lock system. The fingerprints are enrolled in the initialization process using the R307 Fingerprint Reader Module. To begin, create an SSID and password for your Wi-Fi network. Then, after setting up and specifying the Adafruit IO account, modify the IFTTT API key to the predetermined account. After that, the primary

code can be saved and numbered with an ID, and then uploaded and used. The main code can then be safely uploaded to the ESP8266 NodeMCU after being validated.

When the system is powered up, it is in ready state. It will establish an Adafruit IO connection by connecting to the defined Wi-Fi network. The system works by first enrolling the fingerprint in the NodeMCU ESP8266 by uploading the Enroll sketch from the Adafruit Fingerprint Sensor Library in the Arduino IDE. Once uploaded, launch the serial monitor at 9600 baud. Enter a fingerprint ID, place the finger on the scanner, and the fingerprint features will be saved in the on-board memory of the R307 Fingerprint Reader Module. This process can be repeated several times to enrol additional fingerprints using different IDs.

When the fingerprint scanner is ready to accept a fingerprint reading, it will blink. The nodes 'A' and 'B' in Figure 2 represent the two methods for opening the door. The fingerprint scanner is used in 'A,' while the Adafruit IO feed is used in 'B.'

The fingerprint scanner scans the finger placed on the R307 Fingerprint Reader Module in method 'A' and determines if it is registered in the memory. If the door is identified, the buzzer will beep, the owner or user will be notified by Telegram, and the solenoid will open the door. The solenoid will be released after a few seconds, and the door will close. A second Telegram notice will be issued to indicate that the door has been closed. In the case of an unidentified or unknown fingerprint, the buzzer will beep substantially louder, and the owner or user will be notified by Telegram, but the door will not be unlocked.

In method 'B,' pressing the digital push button in the Adafruit IO feed on the smart phone will open the door by triggering the solenoid lock. Users can remotely control the solenoid lock using their mobile phone by using a digital push button on the Adafruit IO feed. This is because an instruction to turn the relay to "HIGH" is transmitted to the NodeMCU ESP8266. The solenoid lock will be released when the digital push button is pressed, closing the door. At this stage, the relay is set to "LOW." The prototype of the smart door lock system is presented in Figure 4.

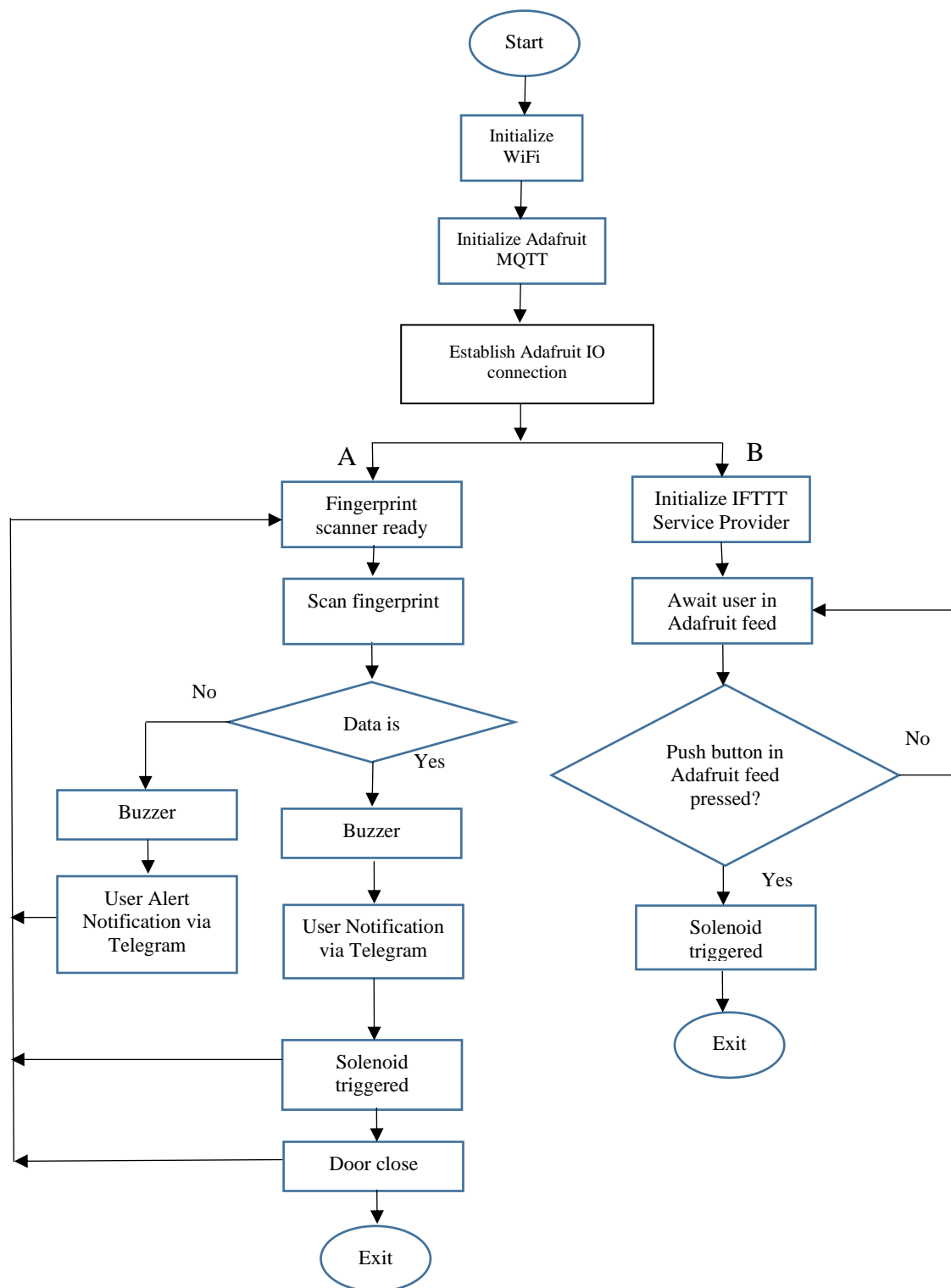
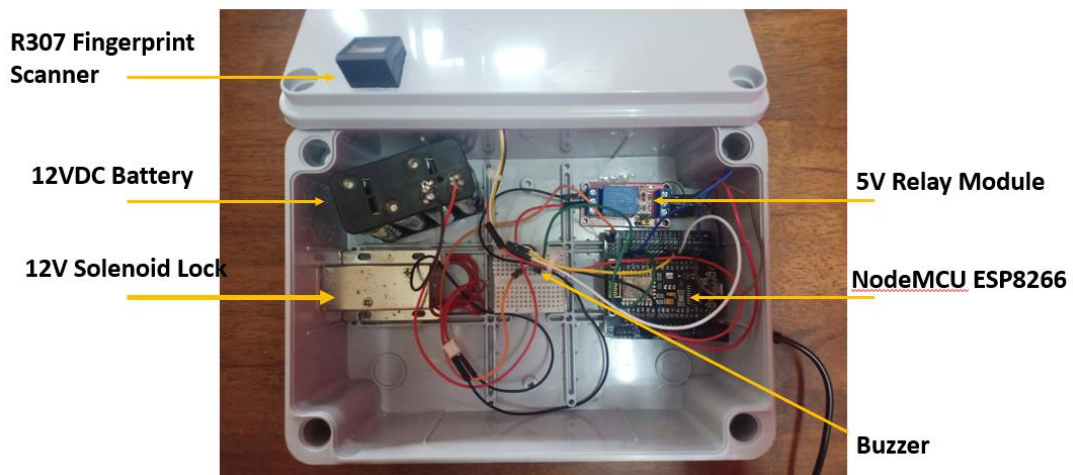


Figure 3: Flow Chart of the Smart Automation Controlling System



(a)



(b)

Figure 4: Prototype of Smart Automation Controlling System (a) Internal view; (b) External view

3. RESULT AND DISCUSSION

The system created was put to the test and yielded significant results. Figure 5 shows Wi-Fi connectivity is successful and the fingerprint scanner is ready for operation. In this system, the user(s) only need to connect to the WiFi network and the ESP8266 NodeMCU, which they can do by setting up a hotspot on their mobile phones.



Figure 5: Connected Wi-Fi Display in Arduino COM Serial Monitor

As illustrated in Figure 6, when the registered fingerprint is placed on the R307 Fingerprint Reader Module, it searches for the ID linked with the fingerprints and opens the door. A Telegram message will be sent to notify of the door opening and closing, as seen in Figure 7. When an unregistered fingerprint is placed on the fingerprint scanner, the latter messages occurs as presented in Figure 7.

```
Provide your finger to activate door lock....
Found ID #1
Door opened
Welcome Azzroul
Door closed
```

Figure 6: Fingerprint indentification message

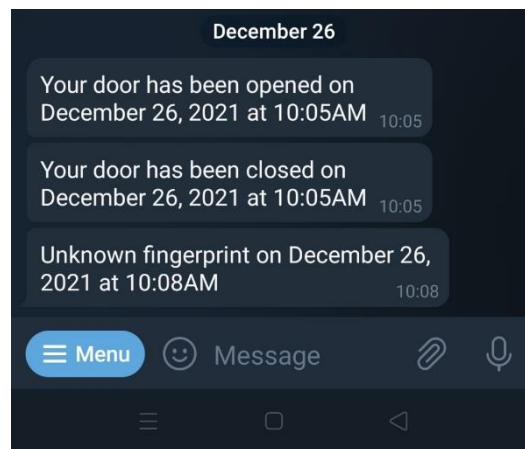


Figure 7: Telegram notification messages

The next step is to test the Adafruit IO feed. The interface for the Adafruit IO feed is as shown in Figure 8. When the digital push button 'OPEN' is pressed, the relay turns "HIGH" and the solenoid lock is triggered. Releasing the digital push button has the opposite effect. In the programming, this event is referred to as 'Moment 1.' Because the input data is sent over the Internet, the distance between the user and the door is irrelevant. This means that the user could open and close the door from anywhere.

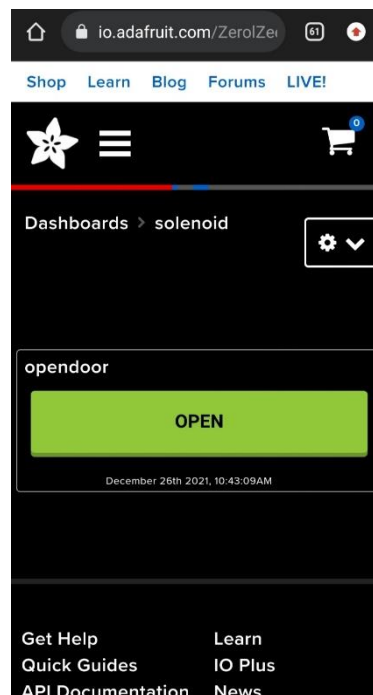


Figure 8: Adafruit IO feed interface digital push button

4. CONCLUSION

This system allows registered fingerprints to unlock the door using the R307 Fingerprint Scanner. The users may easily unlock the door at a moment notice by incorporating the Adafruit IO's digital push button into the system, which dramatically improves quality of life. This system not only sends messages to the users, but it also triggers the buzzer to notify users of an attempted entry. The technology allows users to secure and access the room/safe by using their unique biometric feature; as a result, the token that serves as the 'key' is never lost, and security is considerably increased. Adding a display to show the user's details and developing an attendance system can improve the system while also adding a broader range of functionality to commercial buildings or offices. In addition, voice activation and recognition may be implemented to control the door lock. This could also work well with Google Assistant-powered smart home automation systems.

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I-CReST 2022:135-103 - IOT-Based Smart Automated Controlling System for Residential

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ABSTRACT

Internet of Thing (IoT) is becoming the most promising and life changing technology in this modern world. To make the application more user friendly, web based and android based technologies have gained their importance in this cutting-edge technology. IoT-based smart automated controlling systems integrated with solar powered generation systems are designed to monitor and control the ordinary home appliances remotely. This project presents a concept and prototype for an automation system that will link to other appliances using the ESP8266 NodeMCU Wi-Fi module as a network provider. Through Wi-Fi module, a web server can be added to the module which will help in controlling of devices over Internet. One server can manage many appliances as long as Wi-Fi is connected. It supports a wide range of home automation devices like power management components, and security components. A range of Wi-Fi devices collects and shares data via Internet protocols. Using a smart mobile phone, user(s) may access and manage the wireless appliances from anywhere or set up their workload entirely automatically. In addition, a Google Assistant application integrate with If This Then That (IFTTT) application is built to allow users to control their devices using voice command. The user(s) are able to access and manage their appliances easily by smartphone, voice over, and physical switches.

Keywords: Internet of Things (IOT); Smart Automated Controlling; ESP8266 NodeMCU; Google Assistant; If This Then That (IFTTT) application

1. INTRODUCTION

The Internet of Things (IoT) is a system that allows multiple devices to be monitored and controlled over the Internet. In recent years, the IoT concept has undergone significant evolution, and it is now used in a variety of domains such as smart homes, telemedicine, industrial environments, agriculture and so on. The IoT paradigm now encompasses a variety of several technologies beyond Radio Frequency Identification (RFID) and Wireless Sensor Networks (WSNs). Thus, integrating the IoT concept and WSNs is an appealing option for many application fields, as it can improve efficiency and automation.

Wireless home automation networks are a recent advancement in IoT systems. This system has opened up a plethora of possibilities for the implementation of smart home automation, which is, made up of numerous interconnected sensors and home appliances such as lighting, security and surveillance, air and humidity condition that share the same network. IoT includes creating a network capable of collecting, storing, and analysing data from various sensors. The collected data is then, wirelessly transmitted to smart devices such as personal computers,

desktops, tablets or mobile phones. This system provides a significant impact on electricity consumption, reducing energy waste from homes and buildings. Furthermore, it provides a user-friendly interface that allows the user to easily configure, control, and monitor home devices particularly the elderly and disabled. These include remotely controlling (i.e. turning on or off) home appliances, thermostats, lights, cameras, and other devices via an internet connection using a smartphone or tablet. Users can also set timers for certain adjustments to take effect, such as the security system and smart irrigation system. Another benefit is that it saves energy. Many people, for example, may leave the lights on or forget to turn them off while going to bed or leaving the house. In the event that either of these scenarios occurs, the smart lighting management system can assist with home security. Furthermore, the smart system may be remotely turned on and off on a regular basis, as if someone were at home. As a result, the smart home automation system must have high speed in order to provide reliable communication at an acceptable data rate and connection range [1].

Thus, numerous smart home automation system has been proposed in several works of literature. Most of these schemes present the smart energy-efficient home automation with IoT [2], Arduino-based home automation system [3-5], Google Assistant-enabled voice-controlled smart home system [6,7] and so on from Bluetooth to Wi-Fi technology. The microcontroller is the heart and the most important component of an IoT-based home automation system. Open source hardware microcontrollers that interact with numerous networked sensors, such as Arduino, Raspberry Pi, and ESP8266 NodeMCU, have shown to be particularly effective in home automation systems. Satapathy et al. in [3] proposes Arduino-based home automation. Through this system, various home appliances, such as fan, light, room heater and television can be fully controlled and functional through android smart phone. These devices are linked to local Wi-Fi via an ESP8266-01 communicating module. Susany and Rotar in [8] created a framework to link multiple sensors and devices to the Arduino Mega 2560 development board. The goal of this system is to make real-time monitoring, security, and control as simple as possible for users via the Blynk application. The power bank is used to supply power to the sensors and development boards. As a result, the power bank must be charged using a timer during off-peak hours. Despite the fact that Arduino is open source, cheap, versatile, and easy to program, the microcontroller is not suitable to manage the high level of complexity that comes with advanced projects. For more complicated and real-time projects, Raspberry Pi is a better choice. The Raspberry Pi is an open source computer [9] that runs a web server and provides a web-based control interface. It necessitates the use of a SQL database to keep track of the status of appliances in real time [1]. Raspberry Pi is well-known for having built-in Wi-Fi and Bluetooth features. Rajput et al. in [10] devised a Raspberry Pi-based home automation system that uses speech for persons who are unable to do simple tasks efficiently, particularly the elderly and disabled. Raspberry Pi, on the other hand, is incapable of complex multitasking and is incompatible with other operating systems like windows. The ESP8266 NodeMCU is a low-cost Wi-Fi module that is suited for IoT projects. Home automations using ESP8266 NodeMCU are proposed in [9,11-13]. Balakrishnan in [13] used temperature sensors and an ESP8266 model as the network gateway to construct a MQTT-based secured home automation system. The MQTT protocol is used to send and receive sensor data, as well as to get access to that data. This system also included an Access Control List (ACL) to provide data encryption and, eventually, data encryption on webpages or network devices.

Bluetooth and Zigbee are two extensively used wireless technologies. Home automation utilising Bluetooth-based automation is low-cost, low-power consumption, has an easy-to-use interface, is a network that is easily accessible, and is simple to deploy [14-16]. Zigbee [17] is

a standard-based wireless mesh network that is targeted at battery-powered devices in wireless control and monitoring applications and is supposed to be low-cost with low power consumption. These existing technologies, on the other hand, have limitations such as small range transmission, low data speed, low transmission, and low network stability. Consequently, some researchers proposed a smart home automation system based on Global System for Mobile Communication (GSM) to mitigate the short-range communication of Bluetooth and Zigbee technologies as GSM provides long-range communication [18-19]. Maragatham et al. in [20] proposes Wi-Fi technology, which is presently a requirement in most homes and buildings. Furthermore, Wi-Fi is simple to set up, has greater expandability, and is less expensive.

The main contribution of this manuscript is the design and implementation of a smart home management system that can be controlled manually, via mobile phone, or via voice over using Google Assistant using the solar-powered energy system. The primary objective is to develop a low-cost and effective controlling and monitoring system with readily available components, such as an ESP8266 NodeMCU and relay module. The software such as the Google Assistant intergrated with MQTT and IFTTT are implemented to grant access to authorized users only using valid voice command as valid means of authentication. The main goal of this research is to provide a reliable controlling and monitoring system to tackle the energy usage and security, which has been a significant concern for individuals. This paper describes the system, which consists of two major components: a solar power generation system and an IoT-based smart automated controlling system.

The remainder of this manuscript is structured as follows: Section I introduces the background of the proposed system. Section II describes the system overview. The proposed system is explained in Section III and in Section IV, the results and discussion are presented. Finally, Section V concludes the findings and recommendations.

2. SYSTEM DEVELOPMENT

The use of a smart and efficient system aids in increasing the home automation system's overall service dependability and functionality. The construction of a smart automated control system will improve in the achievement of energy conservation targets while also lowering operational costs. This can also be used as a platform for Internet of Things (IoT) applications in the home, allowing bi-directional communication between interconnected devices like sensors, microcontrollers, and cloud services.

The fundamental idea behind this system is to automate the control of AC devices like LED lamps and fans using a mobile phone, voice commands and manual switching. This system makes use of an inverter-based power generation technology to power the photovoltaic system. The block diagram of the automated controlling system based on the solar power generation system is shown in Figure 1. This system comprises of two main parts, the designed solar power generating system, which includes an 18V 10W solar panel, a solar charger 12V-24V 20A, a solar battery 12VDC, as well as a 12VDC-220VAC converter and importantly the automated controlling system development.

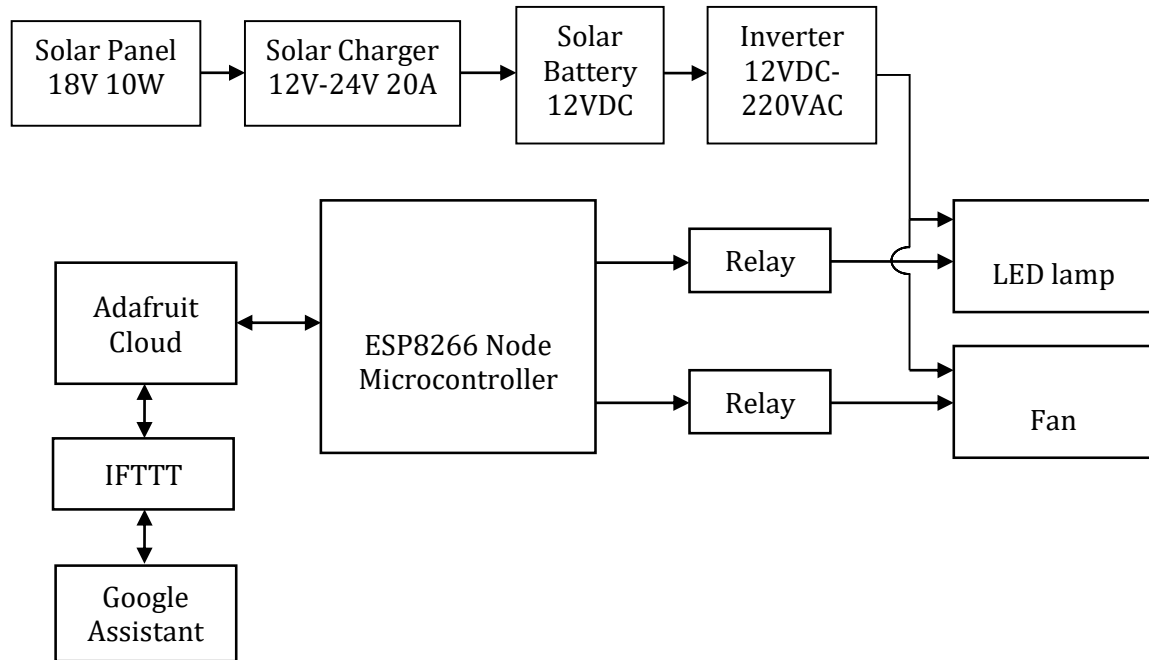


Figure 1: Block Diagram of Smart Automation System

The monocrystalline solar panel is the primary power source in a solar power producing system. Solar panels serve as a medium for converting solar energy into electrical energy through a process known as the photoelectric effect. The solar charge controller receives the output from the solar panel and charges the solar battery. During the day, it keeps the battery from getting overcharged. It also prevents the battery from being exhausted and protects the solar panel from reverse current. The DC power in the solar battery is subsequently converted to AC power by an inverter, which is then routed to predetermined loads such as LED lighting and fans (s). This plan is both cost-effective and easy to implement. The solar battery stores the energy generated by the solar panel. Any required capacity can be obtained by connecting the batteries in serial or parallel.

Referring to Figure 1, the automated controlling system comprises of ESP8266 Node Microcontroller Unit (MCU), relay channel, Adafruit IO and If This Then That (IFTTT). The NodeMCU is an open source programming and rigging advancement condition that is based on the ESP-8266, an extremely unobtrusive System-on-a-Chip. The NodeMCU is powered by a 3.3V supply. It is a prototyping board, that works with the Arduino IDE. The NodeMCU switches the device operations linked by a 5V DC Single Pole Double Throw (SPDT) four-relay board based on the inputs. The relay operates via electromagnetic induction, with the coil, pallet, and contact being the three components that make up a relay. The coil component serves as the relay's input and the coil is not electrically connected to the pallet or contact part. By applying small current and voltages, the relay provide vast current and voltage control to turn off or on the device without being affected by the load frequency.

In addition, one of the main controller is a rocker switch that allows users to control the AC loads via Google Assistant, with their smartphone, or manually. This is to ensure that, in the event that the internet is down, the switch may still work. The switch utilised in this project is a two-way switch that may be controlled by a mobile phone. Aside from that, the system has

the ability to regulate the speed of a fan using a smartphone which is essential particularly for the elderly and disabled citizens.

Adafruit is a cloud service that is open source and may be connected to the Internet. It can communicate with devices using the open OASIS and ISO standard Message Queue Telemetry Transit (MQTT) protocol. A user can use a MQTT library or client to publish and subscribe to a feed as well as to send and receive feed data. MQTT is preferred as it is capable of transmitting data over low network bandwidth and consumes little power [21]. In this project, Adafruit is used to control the light and table fan. Figure 2 shows the switch arrangement in Adafruit IO feeds: ON/OFF for the light (relay1), relay 2, relay 3, relay 4, and Fan Off for the fan. Decoded commands are then transmitted to the microcontroller. After that, the microcontroller replies to the command by operating the relays that are attached to it.

Default			
Feed Name	Last value	Recorded	
<input type="checkbox"/> Fan Off	1	1 day	
<input checked="" type="checkbox"/> relay1	OFF	1 day	
<input type="checkbox"/> relay2	1	1 day	
<input type="checkbox"/> relay3	1	1 day	
<input type="checkbox"/> relay4	1	1 day	
<input type="text" value="Enter new feed name"/> <input type="button" value="Create"/>			

Figure 2: Feeds of Adafruit

IFTTT is a free cloud computing service that is broadly used for many applications such as smart home automation and monitoring as well as smart lights on IoT platform. Its main role is to provide a platform that connects several web services, such as Google, Facebook, and Instagram, allowing them to work together. This type of linked service to connect between two applications or between device and application is also known as Applets. The "this" element of an IFTTT applet is the item that can be used to trigger the Applet, after which the Applet will carry out a command, or action. The "that" element of the IFTTT Applets specifies the action. All of the Applets are the links between the trigger ("this") and the actions ("that"). This Applet will do "that" component when "this" part is activated.

In this paper, Google Assistant, an impressive voice-controlled platform is selected to control and react to the request composed by users [2]. After mastering the trigger, the "that" is designed. To begin, the "that" option for integrating Google Assistant with Adafruit is selected. Then look for Adafruit and choose it. The information that has to be sent to the Adafruit dashboard feed as quickly as feasible is then entered. This creates the action for the trigger, such as the Google Assistant request. When Google Assistant is used on flexible and a voice command is provided, the IFTTT Applets picks up on "this" and sends the data '1' to the Adafruit feed. This will cause an event to appear on the Adafruit dashboard, which the microcontroller will continue to monitor. Figure 3 shows the IFTTT configuration.

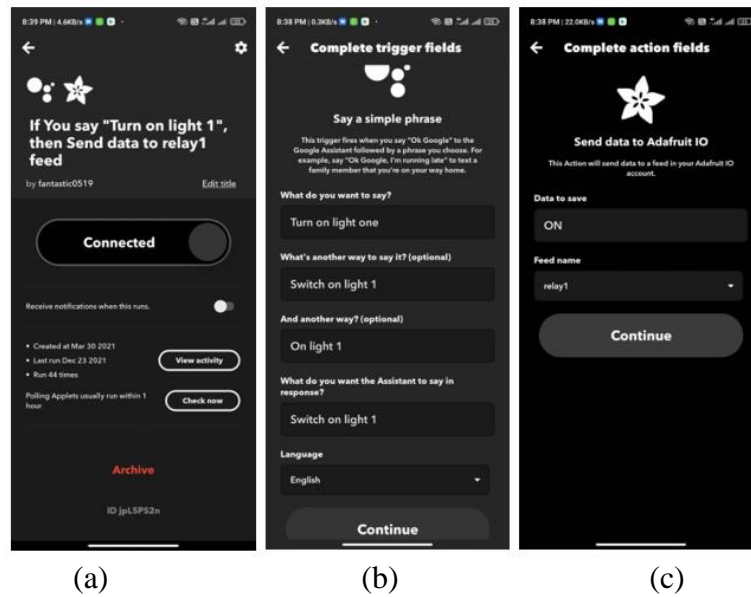


Figure 3: IFTTT Configuration (a) Dashboard Connectivity to Adafruit; (b) Google Assistant configuration to receive command from user using IFTTT; (c) Adafruit configuration in IFTTT

A two-way switch combines two one-way switches into a single unit. One of the terminals can be linked to any of the two at the same time, but not both. A two-way switch has the advantage of allowing user(s) to control a single device from two different locations. The two-way switch used in this project to control the AC appliances manually when the main controller is not connected to the internet or when it is not supplied by a dc power supply.

Figure 4 shows the flow chart of the smart automation controlling system. This circuitry is made user friendly by implementing Internet of Things which allows to operate this circuit through laptops and mobile phones. The first section of the code is to initialize Wi-Fi and connect it to the NodeMCU. Then initialize Adafruit MQTT server, which receives data from Google Assistant. When the user speak on Google Assistant the commands are sent to IFTTT service provider which connects Google Assistant and Adafruit server. The data is subsequently transferred to the NodeMCU, which checks the state of the device. At the same time, the microcontroller checks the data to see if it is a valid instruction to turn the device ON or OFF. When the user says Ok Google, it begins to receive voice commands. When the user says "turn ON Light 1", the lamp turns ON and the user receives a notification that the lamp is switched ON. If the command or input does not match the registered, the filtering and validation procedure will continue, and the lamp will remain idle.

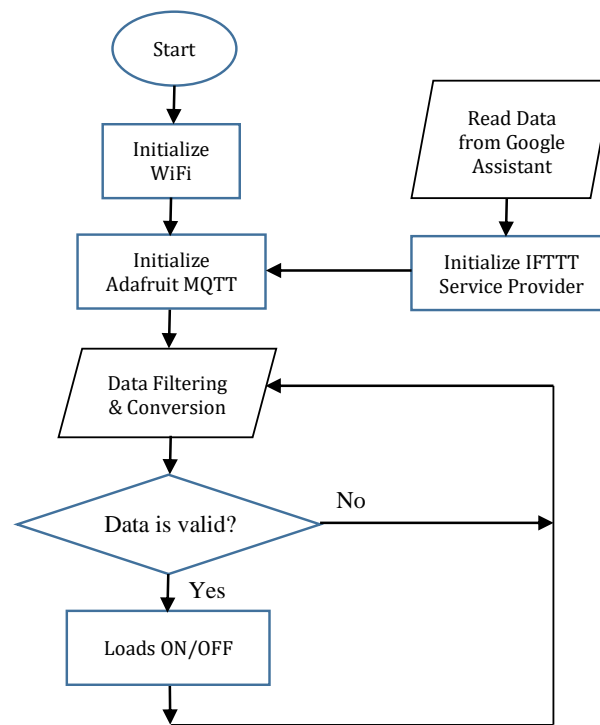


Figure 4: Flow Chart of the Smart Automation Controlling System

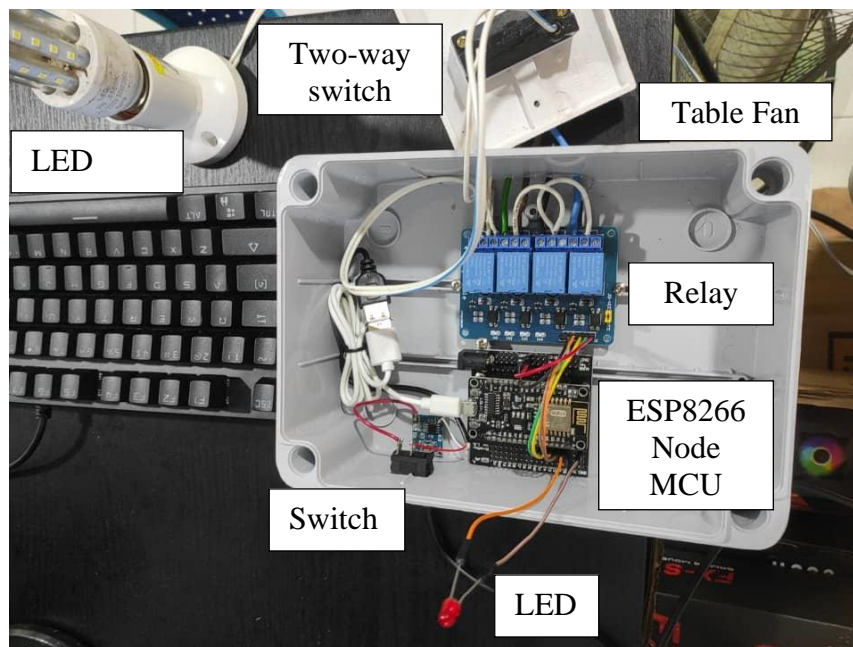


Figure 5: Internal Connection of the Smart Automated Control System

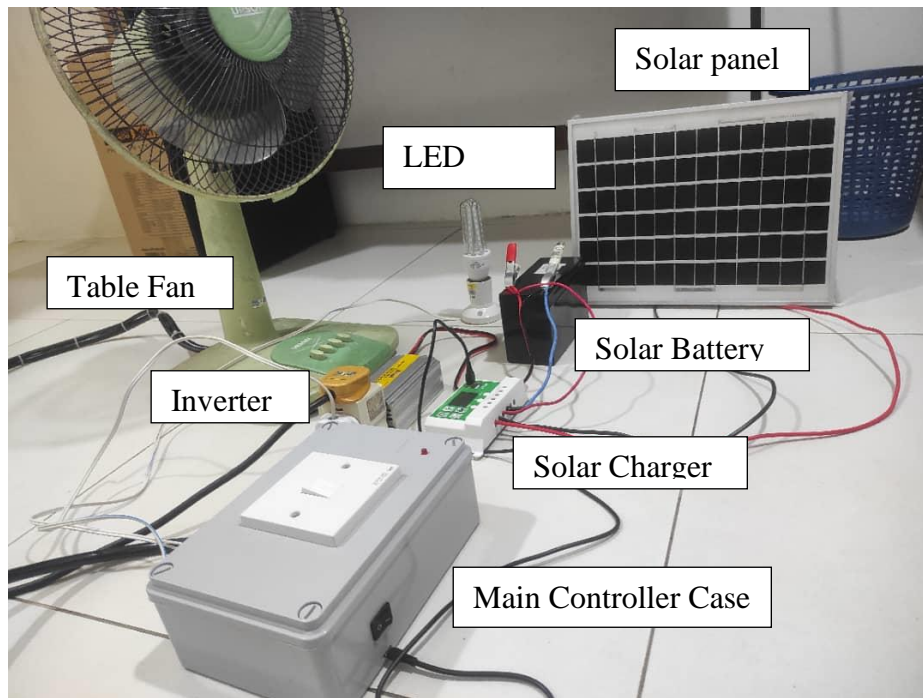


Figure 6: Prototype of Smart Automation Controlling System

3. RESULTS AND DISCUSSION

The system created was put to the test and yielded significant results. In this system, the user(s) only need to connect to the WiFi network and the ESP8266 NodeMCU, which they can do by setting up a hotspot on their mobile phones. The user(s) can control the AC equipment (LED lamp and fan) via mobile phone and voice once the application is connected to the system. The information will be displayed on their mobile phone, laptop, or personal computer for easy access.

3.1 Solar Power Generation System

The solar panel was tested different times throughout the day in the month of October 2021. Figure 7 shows the open-circuit voltage test versus time of the day to verify the functionality of the panel. The output voltage from the solar system was able to produce average voltage of 11V to 13V and the output voltage was significantly enough to charge a 12V battery.

Then, the battery was connected to the system and left to charge for the whole day. The battery output voltage was measured the following day while they were connected to the solar panel and charge controller. The measured battery output voltage was estimated to be 12V. After the individual system parts were successfully checked and tested, the device was connected to the smart automation controlling system as well as AC loads, LED lamp and a fan.

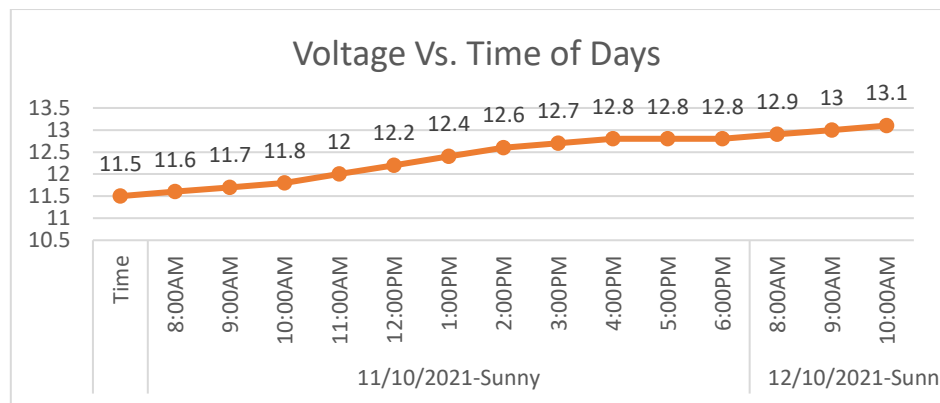
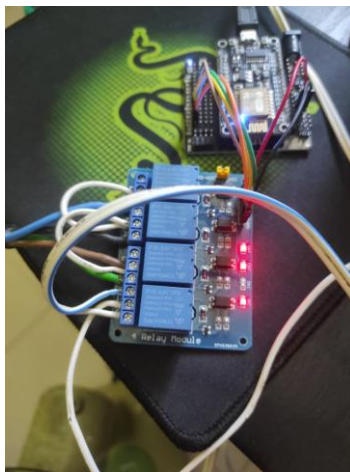


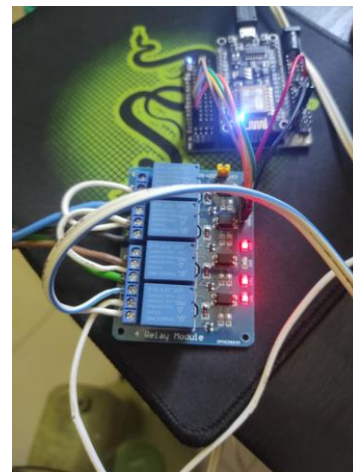
Figure 7: Open-circuit Voltage Test versus Day Time

3.2 Smart Automated Controlling System

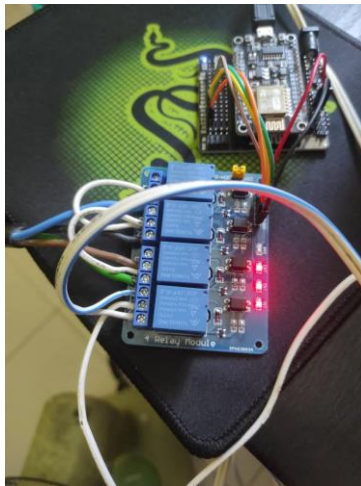
The condition of devices on the hardware can be observed by looking at the LED lights on the relay board, as shown in Figure 8. LED IN1 is connected to an LED light, whereas LED IN2, IN3, and IN4 are connected to a fan. Three relays are required to control the fan speed. When IN1 is turned ON, it will turn OFF the relay (make the relay pin HIGH) and the light is OFF as the relay is active LOW. When LED IN2 is turned OFF, it will turn ON the relay (make the relay pin LOW), the fan is ON and running at speed 1. The same mechanism works When LED IN3 is turned off, the relay is opened and speed 2 is engaged. When LED IN4 is turned off, the relay is opened and speed 3 is engaged. The microcontroller shares this data to Adafruit IO platform as the application shows the status of the device (LED light and fan) whether the device is ON or OFF as shown in Figure 6.



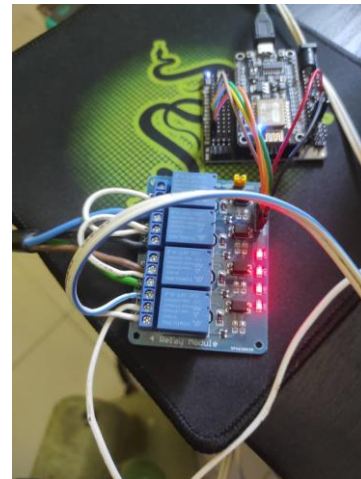
(a)



(b)



(c)



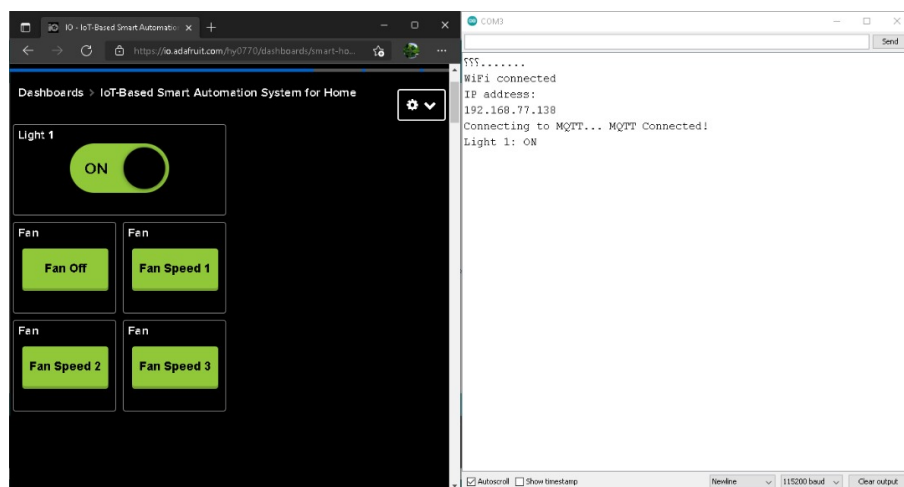
(d)

Figure 8: Four Module Relay Board LED Representation (a) Fan ON, speed 1 (b) Fan ON, speed 2 (c) Fan ON, speed 3 (d) Fan OFF

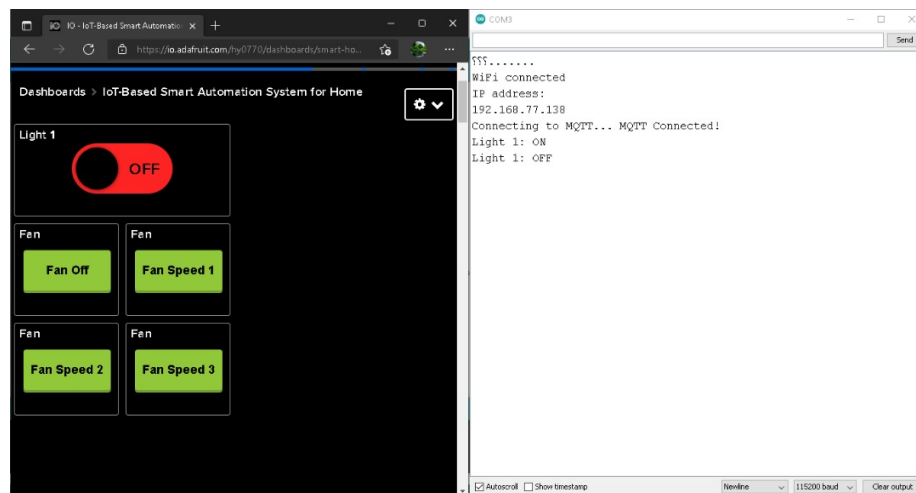
Table 1: Testing of Smart Automation Controlling System

LED from relay				Status	
IN1	IN2	IN3	IN4	LED lamp	Fan
ON	OFF	ON	ON	OFF	ON; Speed 1
ON	ON	OFF	ON	OFF	ON; Speed 2
ON	ON	ON	OFF	OFF	ON; Speed 3
ON	ON	ON	ON	OFF	OFF

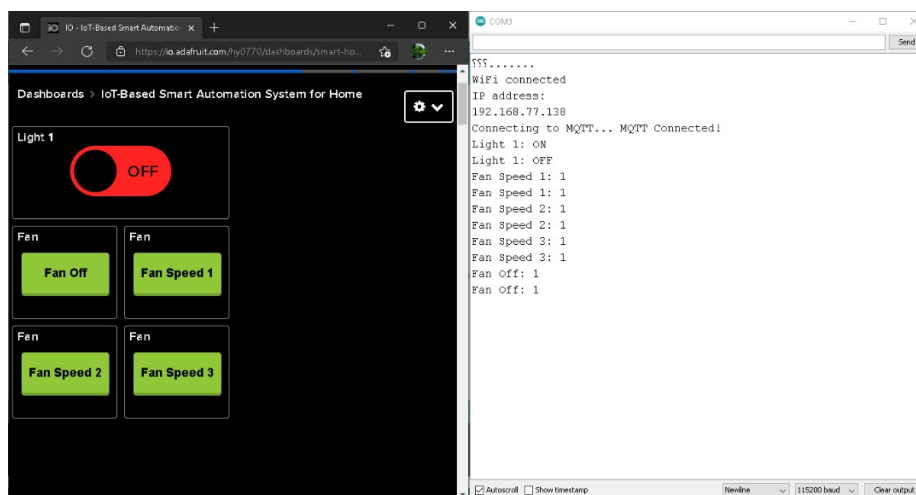
Figure 9 shows the Adafruit IO interface where the users can control and manage the operation of LED lamp and fan speed. Additionally, the serial monitor of the Arduino IDE environment displays the state of WiFi and MQTT connectivity, as well as the LED lamp and fan speed.



(a)



(b)



(c)

Figure 9: Smart Automation Controlling System Adafruit IO Interface and Serial Monitor Display when (a) LED lamp is ON (b) LED lamp is OFF (c) LED lamp is OFF and controlling of fan

4. CONCLUSION

This user-friendly IOT-based smart automated controlling system integrated with solar powered generation went through advanced voice-controlled technology. Instead of using batteries to power the system, solar panels are used, making it more environmentally and energy-friendly. The developed system is easily deployed in residential settings, allowing real-time monitoring and control of home appliances, such as LED lamps and fan remotely using smart mobile phone(s) anywhere and anytime. The implementation is simple, with Google Assistant and IFTTT interfacing Adafruit IO over the Internet. The effectiveness of this system are encouraging as it can improve user safety, intelligence, ease of use and comfort to the users. The system can be further enhanced by expanding it with additional sensors and actuators.

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I-CReST 2022:163-147 - The Awareness, Knowledge, and Financial Literacy Towards Takaful Participation among Muslim Workers

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ABSTRACT

Takaful Participation among Muslims workers has been on the rise lately. However, one must have a good awareness, proper knowledge, and adequate financial literacy before taking part on any Takaful product. This study aimed to identify people's knowledge on Takaful and the effect of financial literacy on Takaful participation. The data were gathered using a quantitative research approach by a sample set of questionnaire survey to our targeted respondents. The questions were divided into 4 sections which are demographic profile, Takaful participation, likert-scale of Takaful knowledge and financial literacy from 266 respondents with a selected area in Malaysia. Descriptive statistics, reliability test, multicollinearity and probit model were used to obtain the sample. From the analysis, it is found that takaful knowledge and financial literacy are found to be insignificant to the Takaful participation.

Keywords: Takaful participation; awareness; knowledge; financial literacy; Malaysia

1. INTRODUCTION

The Takaful industry in Malaysia is regulated by Bank Negara Malaysia. The primary function of the supervisor is to improve the effective governance standards in the organisation and administration of Takaful operators, straightforward communication with consumers on decision making, integration in supervision across sectors and boundaries, inculcates public confidence in the Takaful industry and maintain the constancy of Takaful [2]. According to [1], Takaful also known as Islamic insurance is a type of insurance based on Shari'ah compliance. Takaful differs from traditional insurance in that it has components of uncertainty (*gharar*), interest (*riba*), and gambling (*maysir*), all of which are prohibited by Shari'ah. If no loss happens and the policyholder receives nothing, there is doubt about what the insurance policyholder is "buying" or paying for. In the event of a loss, policy holders are compensated in varied quantities. Gambling (*maysir*) is the second part in traditional insurance and *riba* is the third element in which insurance funds are frequently placed in interest-bearing securities. The source of the word Takaful is originally comes from the Arabic term 'kafala', which means "guaranteeing each other," "joint benefit" or "shared duty"[3]. Takaful is a fast-growing industry that provides insurance policies that are compliant with Islamic law. It is also a Muslim-friendly alternative to conventional insurance. The majority of Muslims around the world have been using Takaful as a platform for sharing financial losses and assisting one another [4].

In Malaysia, the penetration rate of conventional insurance and Takaful products is still low and much below the target. In comparison to developed countries, they have a high level

of awareness and a penetration rate of 80 to 100 percent. In terms of awareness, Malaysia still has a long way to go [5]. Therefore, this study is conducted to find out people's knowledge on Takaful and the effect of financial literacy towards Takaful participation.

2. TAKAFUL IN MALAYSIA

Even though that most Malaysians are familiar with the phrase Takaful that has been introduced many years ago, there are still those who are unaware of its significance and purpose. It is because Takaful education programs are only aimed at professionals and investors who are involved or connected, with only a few targeted awareness initiatives. As a result, people who are not exposed to Takaful programs have lack of knowledge and awareness about Takaful products and services. According to [6], the first stage of any product or service adoption is knowledge. There would be no motive for a consumer to purchase a product or service if they were unaware of it. According to BNM, the aggregate industry capital adequacy ratio (CAR) of 221.2% was significantly above the statutory minimum of 130 percent. All insurers and takaful operators also kept their capital ratios over their internal capital target levels, which ranged from 150 to 250 percent [7].

According to [5], Chief Executive Officer (CEO) of the Prudential BSN Takaful Bhd (PruBSN), Wan Saifulrizal Wan Ismail stated that the current insurance rate was below 40%, which was lower than most regional countries, but that the Takaful business was growing due to greater awareness and knowledge of financial protection and the urgent necessity at this time due to the COVID-19 pandemic. The value of net claims in Malaysia's insurance sector was estimated to be 6.92 billion Malaysian ringgit in 2020. The Net Claims Incurred Ratio (NCIR) fell by about 5% to 52.9 percent in that year, down from 58.2 percent in 2019 [8].

There are two types of Takaful in Malaysia which are general Takaful and family Takaful. General Takaful also recognized as general insurance by its conventional counterparts. It protects participants financially against losses caused by danger such as accident, fire, flood, liability, and burglary. Meanwhile, family Takaful offers financial security to participants and is also recognized as life insurance in the traditional insurance[9]. [10] stated that Takaful differs from conventional insurance in a few ways, including contracts, the parties' privileges and duties, risk ownership, operation, and nominee status. A Takaful contract is based on tabarru' (donation) and ta'awun (mutual co-operation) contracts, whereas a conventional insurance contract is a sales contract in which the policyholder purchases the insurance company guarantee or pledge of reimbursement in the event of catastrophe [11]. According to [9], Takaful differs from conventional insurance in terms of the privileges and duties of the parties. The relationship between the insurance company and the policyholder in conventional insurance is just a business-client relationship, with the insurance company responsible to compensate the policyholder in the event of a misfortune and the policyholder required to pay the premium. Takaful operators and participants, on the other hand, have a one-of-a-kind connection in which the Takaful contract is created using Islamic contract principles to fulfil the basic concept of collaboration and investment. The contract, on the other hand, differs depending on the business model of the Takaful operators.

2.1 Awareness and Knowledge of Takaful

The consumer awareness of Islamic insurance products is still low, despite the lack of knowledge of Islamic banking, finance, and insurance [12]. According to [13], one of the most

significant challenges that Takaful operators face is a lack of public awareness. A study by [14] was done between 536 flood victims in Malaysia's east coast using a quantitative research method with survey questionnaire. Based on various demographic data, this study intends to explore the awareness level about Takaful among flood victims. According to the descriptive and cross tabulation analysis, the majority of the victims were unclear about Takaful. After examining the various backgrounds, it was found that older folks were less aware of Takaful than younger people and married victims were less aware than single victims. According to [13], Takaful continues to face significant challenges in terms of efficiency and future standards, and there is a lack of knowledge and study on Takaful among nations. While according to [15], they discovered that the customers' decision-making process is based on their knowledge and comprehension of how insurance might benefit or fulfil particular life needs.

2.2 Financial Literacy

Financial literacy is defined as the capacity to efficiently organise one's finances by utilising savings to acquire money, then carefully preserving that wealth against depreciation and losses, and ultimately distributing wealth at a later stage of one's life. According to [16], individuals who have a high level of financial literacy are more likely to involve in financial planning, such as investing in unit trusts and acquiring life insurance than those with lower levels of financial literacy. [17] discovered that income level is one of the economic criteria used to determine Takaful demand. According to [18], the income variable has a considerable impact on life insurance/ Takaful participation. As income is one of the elements in financial literacy, it is expected to have a positive relationship with Takaful participation.

Financial literacy is vital for effective financial decision making. Thus, people with inadequate financial literacy are less likely to create wealth and plan for retirement [19]. Financial literacy improves one's ability to deal with day-to-day financial issues and helps to mitigate the negative implications of poor financial decisions, which could otherwise take years to recover [20]. Increasing financial literacy leads to increased engagement in financial planning activities such as stock and property investments, as well as life insurance [21].

3. METHODOLOGY

In accordance with the research objectives, the current study was carried out using quantitative techniques and a survey method to collect data from respondents. The questionnaire is divided into four sections. Section 1 contained few questions about the respondents' socio-demographics, whereas Section 2 involve questions about their participation in a Takaful. Section 3 contained the questions about the awareness and knowledge of Takaful product meanwhile the last section which is section 4 contained some questions about financial literacy. A sample survey was conducted with a total of 266 respondents. This study focused on the Muslim people with a working class aged 20 years and above in the selected area of Malaysia.

The overall frequency of all variables was represented using a frequency distribution. To get a sense of the characteristics of the respondents, descriptive analysis was performed. Following that, multicollinearity was used to determine the extent to which the variables were related to one another. The rule of multicollinearity is that the Variance Inflation Factor (VIF) must be less than 5 to be considered as there is no correlation between the independent variables [22]. Next, probit model regression commonly known as a probit model is used as it is a technique for modelling dichotomous or binary outcomes. The inverse standard normal

probability distribution is modelled as a linear combination of predictors in the probit model [23].

Assume that response variable Y is binary, meaning that it can only have two possible outputs, 1 and 0. For example, Y could indicate the existence or absence of a condition, the success or failure of a device, a yes/no response on a survey, and so on. We also have a regressors X vector, which is thought to influence the outcome Y . So, we assume

$$\Pr(Y = 1|X) = \Phi(X^T\beta) \quad (1)$$

Where \Pr stands for probability, and Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The maximum likelihood is commonly used to estimate the parameters of β . The probit model can be justified as a latent variable model. Assume there is an auxiliary random variable,

$$Y^* = X'\beta + \varepsilon \quad (2)$$

Where $\varepsilon \sim N(0, 1)$. Then Y can be used to predict whether or not this latent variable is positive.

$$Y = \begin{cases} 1 & Y^* > 0 \\ 0 & \text{Otherwise} \end{cases} = \begin{cases} 1 & X^T\beta + \varepsilon > 0 \\ 0 & \text{Otherwise} \end{cases} \quad (3)$$

Because adding a fixed amount to the mean can be compensated by subtracting the same amount from the intercept, and multiplying the standard deviation by a fixed amount can be compensated by multiplying the weights by the same amount, using the standard normal distribution causes no loss of generality when compared to using an arbitrary mean and standard deviation. To demonstrate that the two models are identical, consider the following,

$$\begin{aligned} \Pr(Y = 1|X) &= \Pr(Y^* > 0) \\ &= \Pr(X^T\beta + \varepsilon > 0) \\ &= \Pr(\varepsilon > -X^T\beta) \\ &= \Pr(\varepsilon < X^T\beta) \\ &= \Phi(X^T\beta) \end{aligned} \quad (4)$$

4. FINDING AND DISCUSSION

4.1 Validation of the Questionnaire

The validity of the questionnaire is computed using the Statistical Package for Social Science (SPSS) software programs for Windows in the first step of the analysis. Prior to its wider distribution, the questionnaire was piloted with 30 people to ensure that it met the Cronbach Alpha, which must be at least 0.7 for the items to be considered reliable. Any items in the survey that did not get a score of 0.7 were deleted, and the rest were used for further research. The Cronbach Alpha scores for all variables have a Cronbach Alpha value greater than 0.7, indicating that they are reliable. As a result, the questionnaire instrument is consistent in measuring all characteristics and is free of random error. The reliability statistic is illustrated in Table 1 below:

Table 1: Cronbach alpha for Pilot Study

Code	Name of Aspects	α
TP	Takaful Participation	0.711
TK	Awareness and Knowledge of Takaful	0.917
FL	Financial Literacy Management	0.762

4.2 Descriptive Analysis

4.2.1 Demographic Profile

A total of 266 Muslim working people participated in the online survey, where 20.3% of the respondents are male and 79.7% of the respondents are female. The majority of the respondents were between the ages of 20 to 30, representing about 74.8 percent of all respondents followed by the ages of 31 to 40 which depicted a total of 12.4% of respondents. In comparison to other age groups, the age groups of 41 to 50 years and 51 years and above had the lowest number of participants, with 6.8 percent and 6.0 percent respectively. This is illustrated in Table 2 below with other socio-demographic characteristics (education background, occupation, marital status, and monthly individual income).

Besides that, Table 2 shows that 59.8% of the respondents are bachelor's degree graduate while 14.3% are diploma holder. Most of the respondents are working in various sector which depicts 32.0%, 29.7% are private sector employee and 19.9% are from government sector employee. The minority group of the respondents are self-employed and housewife. In general, 70.3% of the respondents earned below RM 2,000, 17.3% of the respondents earned between RM 2,001 to 4,000 and 6.8% earned between RM 4,001 to 6,000 for their monthly individual income. Individual incomes above RM 8,001 are dominated by a small percentage of respondents.

4.2.2 Participation of Takaful

Table 3 shows the participation of Takaful among Muslim workers. Among 266 respondents, 97.7% of them stated that they have heard about Takaful while a small portion of 2.3% stated otherwise. Most of them heard about Takaful from internet or social media which represents 46.6%, 22.6% heard about Takaful from relatives, friends or neighbours, 16.2% heard about Takaful from agents and 9.0% of them heard it from television or radio. Therefore, it shows that internet or social media plays a very big important role in disseminating the latest information and imparting a knowledge. From this online survey, there are 54.9% of the respondents have participated in any of the Takaful scheme offered in the market while the rest of 45.1% have not participated in any of the Takaful scheme. This might because of the respondents in this survey are mostly from the age group of 20 to 30, so maybe they still not have the awareness about the importance of the Takaful as some of them still not have a property or motor vehicle that need to be insured.

Table 2: Demographic Profile of the Respondents (N =266)

Variable	Subject	Frequency	Percentage (%)
Gender	Male	54	20.3
	Female	212	79.7
Age	20 to 30	199	74.8
	31 to 40	33	12.4
	41 to 50	18	6.8
	51 above	16	6.0
Education background	Secondary school	31	11.7
	Certificate	21	7.9
	Diploma	38	14.3
	Bachelor's degree	159	59.8
	Master's degree	13	4.9
	PhD	0	0
	Others	4	1.5
Occupation	Self-employed	36	13.5
	Private sector employee	79	29.7
	Government sector employee	53	19.9
	Housewife	13	4.9
	Retired	0	0
	Others	85	32.0
Marital status	Single	168	63.2
	Married	94	35.3
	Divorced/ separated	1	0.4
	Widowed	3	1.1
Monthly individual income	Below RM 2,000	187	70.3
	RM 2,001 to 4,000	46	17.3
	RM 4,001 to 6,000	18	6.8
	RM 6,001 to 8,000	9	3.4
	RM 8,001 and above	6	2.3

Table 3: Participation of Takaful

Variable	Subject	Frequency	Percentage (%)
Have you heard about Takaful?	Yes	260	97.7
	No	6	2.3
How did you hear about Takaful?	Television or radio	24	9.0
	Newspaper or magazine	3	1.1
	Internet or social media	124	46.6
	Relatives, friends or neighbors	60	22.6
	Agents	43	16.2
	Others	12	4.5
Have you participated in any of the Takaful schemes offered in the market?	Yes	146	54.9
	No	120	45.1
If you engage with insurance policy, what	Compulsory	55	20.7
	Voluntary	211	79.3

makes you engage with it?

If you engage with insurance policy, it is because of:	To get compensation for losses from certain events	113	42.5
	Influenced by friends, peers and family members	18	6.8
	To secure from misfortune	92	34.6
	Others	43	16.2

This study demonstrated that 79.3% of the respondents will have it voluntarily if they engage with insurance policy and the rest of 20.7% own it by compulsory. 42.5% of the respondents engage in insurance policy in order to get compensation for losses from certain events and 34.6% of them engage in insurance policy to secure from misfortune. Meanwhile, some of them are influenced by friends, peers and family members in engaging the insurance policy has the smallest number of participants with 6.8%.

4.2.3 Knowledge of Takaful

Table 4 below displays the level of score for each item under the knowledge of Takaful variable. The scores are calculated using the participants' level of Takaful knowledge through the questionnaire.

The Likert scale values range from 1 (strongly disagree) to 5 (strongly agree). All of the elements from row 1 to row 8 have a score of greater than 4 (refer to the mean column), indicating that the 266 respondents agree or strongly agree on the question regarding Takaful awareness and knowledge. Overall, respondents were either agreed or strongly agreed that Takaful is suitable for anyone regardless of religion ($M = 4.44$) and also they were agreed or strongly agreed that Takaful products comply with Shari'ah with a mean score of 4.33.

Table 4: Knowledge of Takaful

Code	Items	Min	Max	Mean	SD	Skew.	Kurt.
TK1	Takaful products comply with Shari'ah	1	5	4.33	0.769	-0.896	0.334
TK2	Takaful is suitable for anyone regardless of religion	1	5	4.44	0.837	-1.716	3.273
TK3	Takaful is free from interest (Riba), uncertainty (Gharar) and gambling (Maysir).	1	5	4.23	0.906	-1.061	0.848
TK4	Takaful does not involve in any prohibited business activities.	1	5	4.25	0.869	-1.138	1.363
TK5	Takaful can provide the coverage and benefits similar to conventional insurance	1	5	4.19	0.908	-0.959	0.502
TK6	Takaful policy holders mutually share the risk	1	5	4.06	0.938	-0.757	0.162

TK7	Profits generated from Takaful are distributed to the participants	1	5	4.05	0.978	-1.042	1.106
TK8	Takaful has been offered in many countries all over the world	1	5	4.10	0.902	-0.723	0.096

Min: Minimum; Max: Maximum; SD: Standard deviation; Skew.: Skewness; Kurt.: Kurtosis

Other than that, this survey found that the respondents were agreed that Takaful can provide the coverage and benefits similar to conventional insurance ($M = 4.19$), does not involve in any prohibited business activities ($M = 4.25$) and free from interest (Riba), uncertainty (Gharar) and gambling (Maysir) ($M = 4.23$). They also agreed that Takaful has been offered in many countries all over the world ($M = 4.10$). Some of the respondents were either moderately agreed or agreed that profits generated from Takaful are distributed to the participants ($M = 4.05$) and they might be still do not have a strong knowledge that Takaful policy holders mutually share the risk ($M = 4.06$).

The standard deviation for all items ranges between 0.7 and 1.0 indicates that the values in a statistical data set are close to the mean of the data set. Meanwhile, the skewness of items TK2, TK3, TK4 and TK7 are determined to be less than -1.0 indicates that the sample data has a high skewed distribution. The rest of the items have a moderately skewed left curve as it represents the value between -0.5 and -1.0. In addition, the data points of TK2, TK4 and TK7 have the value that is greater than +1.0, depicts that the distribution is too peak or leptokurtic. For this sample data, both skewness and kurtosis are appropriate because skewness values range from -3 to +3, and kurtosis values range from -10 to +10 [24]. This result indicates that Muslim workers in Malaysia have a high level of knowledge about Takaful products.

4.2.4 Financial Literacy

The level of scores for each item clustered under the financial literacy variable are shown in Table 5. The participants' chosen level (from strongly disagree to strongly agree on a 5-likert scale) is used to construct the scores on their financial literacy.

As seen in Table 5, the Likert scale scores range from 1 (strongly disagree) to 5 (strongly agree). All of the items from row 1 to row 5 have a score of less than 4 (refer to the mean column), indicating that the 266 respondents were either moderately agree or disagree of their financial literacy management. However, item FL4 is found to score less than 3 ($M = 2.83$), implying that the purchase of Takaful affects most of Muslim employee's income saving and item FL3 achieved a score of ($M = 3.77$), showing that Muslim working people moderately agree that they have a clear idea of their financial needs also must be distributed into Takaful.

Table 5: Financial Literacy

Code	Items	Min	Max	Mean	SD	Skew.	Kurt.
FL1	My salary is enough to buy personal insurance or Takaful	1	5	3.48	1.133	-0.484	-0.367
FL2	I have better understanding of how to invest money on personal insurance or Takaful	1	5	3.43	1.059	-0.272	-0.347
FL3	I have a very clear idea of my	1	5	3.77	1.016	-0.563	-0.146

	financial needs also must be distributed into Takaful or insurance protection						
FL4	The purchase of insurance or Takaful affects my income saving	1	5	2.83	1.114	0.183	-0.441
FL5	I am capable of keeping a stable and balanced financial records even after investing on Takaful	1	5	3.57	0.966	-0.434	0.107

The standard deviation for all items ranges between 0.9 and 1.2 indicates that the values in a statistical data set are close to the mean of the data set. In the meantime, all the items approximately have a skewness between -0.5 and +0.5, representing that the sample data illustrates an approximately symmetric curve. Moreover, all the data points have a negative kurtosis except the item of FL5 which exhibits a positive kurtosis. It shows that the distribution is platykurtic, which means it is significantly flatter than normal. Both skewness and kurtosis are valid for this sample data, as skewness values range from -3 to + 3, and kurtosis values range from -10 to + 10 [24]. In conclusion, this survey shows that Takaful participation affects Muslim employee's income saving and stability of their financial records.

4.2.5 Multicollinearity

Multicollinearity occurs when the independent variables in a regression model are highly correlated with one another. The Variance Inflation Factor (VIF) for each independent variable is used to test for multicollinearity. Table 6 above shows there is no multicollinearity problem between the independence variables as its tolerance values (0.905) which exceed 0.2 and its Variance Inflation Factor (VIF) exhibits the values of 1.105 that is less than 5. Thus, there is no correlation between these two independent variables.

Table 6: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.921	.165		11.634	.000		
	TK	-.041	.037	-.070	-1.123	.262	.905	1.105
	FL	-.107	.030	-.223	-3.565	.000	.905	1.105

a. Dependent Variable: TP

4.2.6 Probit Model

The participation of Takaful was investigated using a binary probit model. In this model, the dependent variable is a binary variable, which is whether or not to participate in Takaful. The analysis was conducted using STATA. The details of parameter estimates are shown in Table 7.

Iteration 0: log likelihood = -173.94686

Iteration 1: log likelihood = -165.1735

Iteration 2: log likelihood = -165.15271

Iteration 3: log likelihood = -165.15271

Probit regression Number of obs = 266

LR chi2(2) = 17.59

Prob > chi2 = 0.0002

Log likelihood = -165.15271 Pseudo R2 = 0.0506

Table 7: Probit Model

TP	Coefficients	Std. Error	z	P> z	[95% Conf. Interval]	
TK	-0.1170547	0.0994882	-1.18	0.239	-0.312048	0.0779386
FL	-0.2941915	0.0846115	-3.48	0.001	-0.4600269	-0.1283561
_cons	1.180521	0.4578808	2.58	0.010	0.2830906	2.077951

The iteration log indicating how quickly the model converged. The log likelihood (-165.15271) can be used in comparison of nested models. The output showed that all 266 observations in this dataset were used in the analysis. The likelihood ratio chi-square of 17.5 with a p-value of 0.0002 indicated that this model as a whole is statistically significant, that is, it fit significantly better than a model with no predictors.

Surprisingly, the result showed that only variable FL (Financial Literacy) is statistically significant while the variable TK (Takaful Knowledge) depicts an insignificant result as its p-value (0.239) > 0.05. The change in the z-score or probit index for a one unit change in the predictor is represented by the probit regression coefficients. For a one unit increases in TK, the z-score decreases by 0.117 while the z-score drops by 0.294 for every one unit rise in FL. The negative coefficients of these two variables indicate that as the level of Takaful knowledge and financial literacy increases, the probability to participate in Takaful decreases. These findings showed that Takaful knowledge and financial literacy were important aspects in quantifying the participation of Takaful.

4.2.7 Sensitivity and Specificity

Table 8: Sensitivity and Specificity analysis using Stata

Classified	D	~D	Total
+	14	16	30
-	82	154	236
Total	96	170	266
Sensitivity	14.58%		
Specificity	90.59%		

Table 8 above is one of the approaches to calculate the proportions of Takaful participation. The terms positive and negative are used to refer to the participation of the Takaful among Muslim working people. Thus, there are 96 true positives and 170 true negatives. In this 96 true positive, 14 were correctly classified by the model to participate in Takaful while 154 from true negative were correctly classified by the model to not participate in Takaful.

The proportions of these two groups that were correctly classified were $14/96=0.1458$ and $154/170=0.9059$ which give a value of sensitivity and specificity respectively. The sensitivity

of the test is the percentage of cases that observed to participate and were correctly predicted to participate by the model. Meanwhile, specificity is the percentage of those individuals who did not participate and were correctly predicted by the model to not participate in Takaful. These two proportions are estimates of probabilities. Therefore, probit model gives a result that only 14.58% individual that participate in Takaful and 90.59% individual did not participate in Takaful. This may indicate that the test is useful, but it does not imply that a big percentage of the population is a promising indicator of Takaful involvement.

5. CONCLUSION

The conclusion should answer the research objectives. In specific, it should include the following: (1) the principles and generalisations inferred from the results; (2) any perceptions, problems, or limitations of the work; (3) theoretical and/or implications of the work; and (4) recommendations for future work.

This study aims at two objectives which were to find out people's knowledge on Takaful and the effect of financial literacy on Takaful participation. In general, we targeted on 266 respondents focusing on 54 male and 212 female Muslim workers. The descriptive statistics showed that 146 respondents from this survey participated in any of the Takaful schemes offered in the market. The results depicted that there is no multicollinearity problem between these two independent variables. However, probit model revealed that as the level of Takaful knowledge and financial literacy increases, the probability to participate in Takaful decreases. This problem might occur based on the data that the respondents from age 20 to 30 filling in the survey questionnaire. Despite they have an extensive knowledge in Takaful, several issues may hinder them from joining Takaful as some of them are still striving to maintain their financial situation at this age. As this problem happen, more actions needed to be taken for future analysis and we also need to look with different perspectives.

Even though the study met its objectives, it still has several limitations. This research is limited because it only looked at Malaysia's experience. The findings are representative of the target segment as well as the takaful industry although they are not definitive. Other focus group study could be undertaken in the future for general takaful research to examine new trends and acquire fresh ideas for a more thorough study using other variables as the variables of this study gave a negative impact on Takaful participation. The research also could be expanded to other countries that offer general takaful products.

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I-CReST 2022:192-169 - Design and Implementation of Indoor Positioning System Technology Using Support Vector Machine (SVM) Classification Method on Mobile Attendance Application

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ABSTRACT

In Syiah Kuala University (SKU), attendance is required for both students and lecturers. Lecturers are required to have their attendance taken as a proof that the class has taken place, and students are required to attend a minimum of 75% of the total attendance in order to take the final exam. An application was built in 2019 that records such attendance. This application used Indoor Positioning System (IPS) technology using KNN classification method. However, the results of this method are still lacking due to the low accuracy rate and longer execution time. For this reason, improving the application is important that will increase the accuracy of the positions for both lecturers and students as well as faster execution times. In order to do this, the number of datasets are increased and the classification method is changed from KNN to Support Vector Machine (SVM). By using SVM, it is expected to improve both the accuracy and execution time. Increased datasets are achieved by adding more Bluetooth Low Energy (BLE) beacons in the classrooms. An android application was built to record the lecturers and student's attendance. This application was black box tested. The application successfully performed the necessary tasks. The usability of this application was tested using System Usability Scale (SUS). The lecturer's side of the application received a score of 83,9 and the student's side of the application received a score of 78,5.

Keywords: Bluetooth low energy; indoor positioning system; support vector machine; usability testing; system usability scale

1. INTRODUCTION

As it is required in any other higher education institution, recording attendance is a must during the lecture process. Normally lecturers will take their students' attendance at the start of the lecture. Syiah Kuala University (SKU), has implemented many different solutions regarding attendance. From the early years of crude manual attendance recording using pen and paper, to the online attendance system available through a website.

Just before the pandemic hits, SKU has been trying to implement an online based attendance system. This is to avoid any missing or incorrect attendance data which is important to both lecturers and students. The latest evolution of the attendance application is a mobile application that can capture the signal of Bluetooth beacons places in a lecture hall or classroom [1]. This was carried out with the location of the students and lecturers in mind; to prevent either party to record their attendance before the lectures started. The current online website

for recording attendance can be accessed from anywhere and there is not location data present. Hence, students and lecturers can physically be anywhere without being in the exact location.

Puspitasari, developed her mobile attendance application with the same principle. Bluetooth Low Energy (BLE) beacons are placed around the lecture halls/classrooms and the users' application will capture this signal and record their attendance. While this is useful during the COVID19 pandemic when mostly everyone was staying at home. With more relaxed rules and regulations on attending classes offline are in place, there will be problems with attendance recording with the website.

Therefore, this research aims to improve the previous research's mobile attendance application, by developing a mapping application that will be used to gather initial training data, then a mobile attendance application for both lecturers and students to use, and finally to develop an administrator website to maintain the data. This research also switches the classification method from KNN classification method to Support Vector Machine (SVM) classification method.

2. METHODOLOGY

2.1 Materials and Location

The location of the research would be in the Faculty of Mathematics and Natural Sciences Building A, Syiah Kuala University, Banda Aceh, Indonesia. The lecture classrooms used will be on the second floor, classrooms E.02.06, E.02.07, and E.02.08.

For the materials, hardware that will be used, are 1 unit Acer Aspire E5-475g Laptop with a 4GB RAM, Intel R Core™ i5-3230M CPU @ 2.60GHz (4 CPUs), 2.6 GHz Processor, 1 TB Hard disk with a 64-bit Windows Operating System and 30 units of Bluetooth beacons.

The software used in this research are as follows: Windows 10 Operating System, Android Studio 3.6, IntelliJ IDEA 2019 3.3, PhpStorm 2019 3.3, and Postman 7.19.1.

2.2 Methodology

Figure 1 shows the flow of this research. The application will be developed using Scrum methodology, while the functional testing will be carried out using black box testing and finally usability testing will be conducted with System Usability Scale (SUS) questionnaire. Each stage will be explained in further sections.

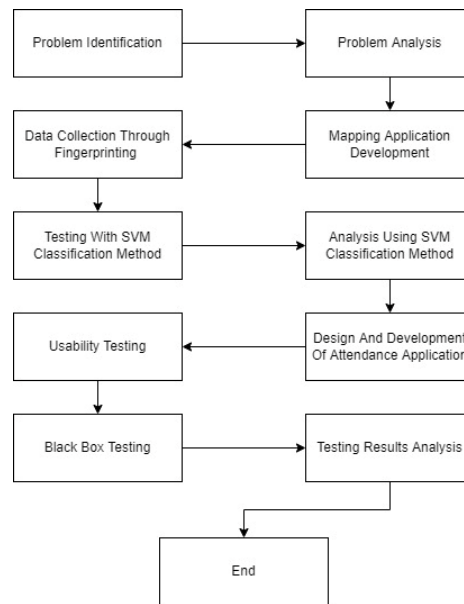


Figure 1: Research Workflow Diagram

2.3 Problem Identification

In this stage, the research started by looking into the past application and its problems. The previous mobile attendance application had longer execution time by 30 seconds with large amount of data [1]. The other problem was the accuracy was still low, which is 78% [1]. Based on the observation carried out in the Department of Informatics and on the previous application there were other several problems; they are: there were no RSSI mapping application, GPS technology cannot perform adequately within a building and there no other mobile attendance application within the Department of Informatics that has adequate accuracy.

2.4 Requirements Analysis

During this stage, functional and non-functional requirements for the entire system are identified. Functional requirements are requirements that define the features and what the system can do [2]. While non-functional requirements are the external limitations that must be defined that will be fulfilled by system [3].

The main non-functional requirements for this research are: attendance recoding must be started by the lecturer, both students and lecturers can no longer record attendance after 50 minutes of the classes started, attendance recording will be carried out as a background process, the application can only start recording attendance once Bluetooth is turned on the device and finally the system can only detect the location of users within the building that has been mapped earlier.

Meanwhile, there are two functional requirements, they are: showing the prediction of the user's location and carrying out the attendance process as a background process with an Android smartphone application with adequate accuracy.

2.5 Application Design and Development

The application was developed with Scrum methodology. Scrum is software development methodology that is based on an incremental model. In each iteration, known as sprint, several stages take place, as seen in Figure 2; to reach the Minimum Viable Product (MVP). The sprint is usually 4-6 weeks long and it is repeated until the final product has completed all of the requirements defined earlier in the software development [4].

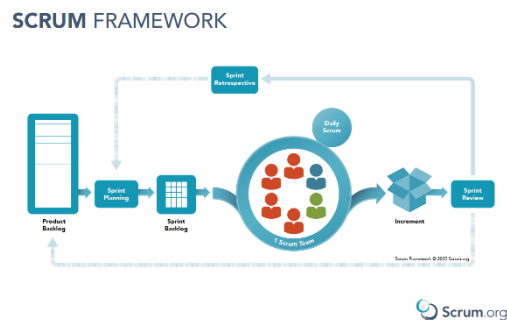


Figure 2: The Scrum Framework [5]

2.6 Mapping Application Development

The mapping application is a support Android based application that will be used in collecting the initial signal strength data or to map out the RSSI values. These data will then be used in the mobile attendance application.

2.7 Data Collection

The data collected will be based on the reference points and the placement of the beacons in the lecture classrooms of E.02.06, E.02.07 and E.02.08. Figures 2 and 3 show the classroom plans of how the classrooms look like with the beacons in place.

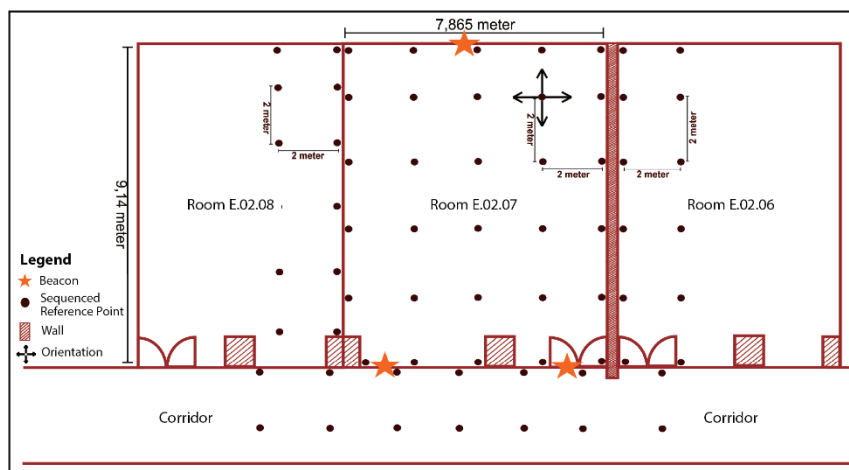


Figure 3: Classrooms plan with sequenced reference points

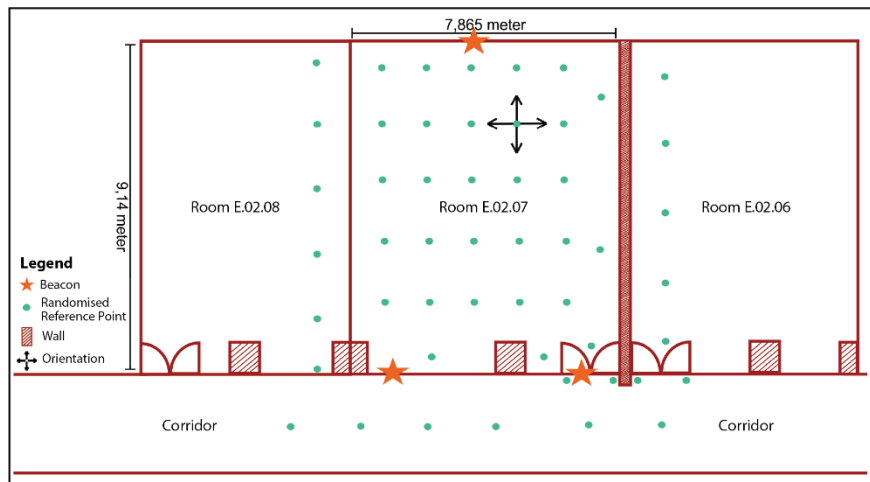


Figure 4: Classrooms plan with randomised reference points

Figure 3 and 4 also shows the reference points that will be used to collect the signal strength. In Figure 3 the reference points are sequenced for every 2 metres. This is performed in order to minimise the errors that may occur in marking a position. In Figure 4 is shown the same sketch but with randomised reference points without looking into the distance between the points. This is carried out in order to determine the data collection location where the beacons are transmitting the signals. Determining closer reference points will affect the positioning stage [6].

2.8 Android Application Development

There will be two main Android based application that will record the attendance of the students; first would be the student's side of the application and the second one would be the lecturer's side of the application. Both applications are required to turn on their Bluetooth during the course of the lecture and attendance can only start when the lecturers and students are already in the classroom or hall.

2.9 Web-based Application Development

The web-based application is used to ease the staff and administrators of the Faculty of Science and Mathematics to recapitulate attendance data of both students and lecturers. These data are then later used accordingly, for example to check the performance of every lecturer. This application will present the data based on the subject code and the dates of the lectures based on the subject chosen.

2.10 Accuracy Testing

This accuracy testing is carried out by looking at the best hyperplane; by maximising the distance between classrooms or halls. Hyperplane is a function that can be used as a separator between classrooms or halls based on the data collected [7].

2.11 Black box Testing

Black box testing focuses on verifying that the actual system works based on the specification set earlier during the requirements analysis stage. The testing process normally checks on how the system works; whether the system has followed the original business flow or not. This type of testing only looks into the input and output of the system and whether it is working as expected [8].

2.12 Usability Testing with System Usability Scale (SUS)

Usability testing is conducted to evaluate the system by giving them a questionnaire to targeted users after they have used the system. Table 1 shows the SUS questionnaire used in this research which consists of 10 questions and uses a Likert scale from 1-5. Equation 1 shows how to calculate SUS Score. Table xx shows the SUS score interpretation, which can range from unacceptable to acceptable.

Table 1: SUS Questions [9]

Question Code	Question
R1	I think I would like to use this system frequently
R2	I found the system unnecessarily complex
R3	I thought the system was easy to use
R4	I think that I would need the support of a technical person to be able to use the system
R5	I found that the various functions in this system were well integrated
R6	I found that there were too much inconsistencies in the system
R7	I would imagine that most people would learn to use this system very quickly
R8	I found the system very cumbersome to use
R9	I felt very confident using the system
R10	I needed to learn a lot of things before I could get going with this system

Table 2: SUS Score Interpretation [10]

SUS Score	Interpretation
< 50	Unacceptable
50-70	Marginal
>70	Acceptable

3. RESULTS AND DISCUSSION

3.1 Overall Development

Figure 5 shows the workflow for this entire system. As can be seen in Figure xx, there are several key components in this research. The first process will be BLE beacons sending signals to the attendance application. Next, the application will access the training data stored in the database, where the SVM classification takes place. After this process is carried out, the location prediction of the user will be returned to the application. Then, the application will check if the attendance process was successful, if not, then the user is required to redo the attendance. If the attendance was successful, the data will be stored in the database and later

can be viewed in the web-based application. The screens of how each application look like will be explained in further sections.

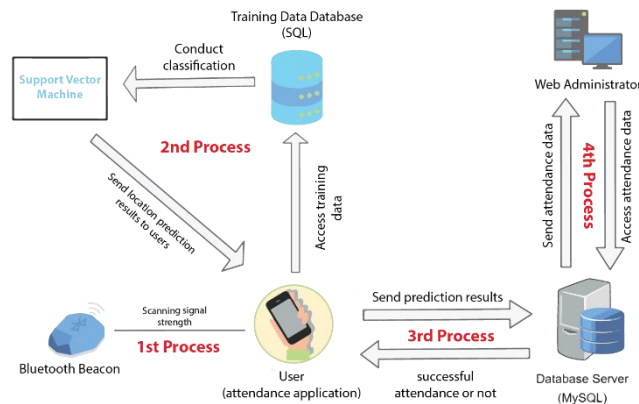


Figure 5: Entire System Workflow

3.2 Mapping Application

The mapping application as built first in order to collect the signal strength data. Figure 6 shows the look of the mapping application.

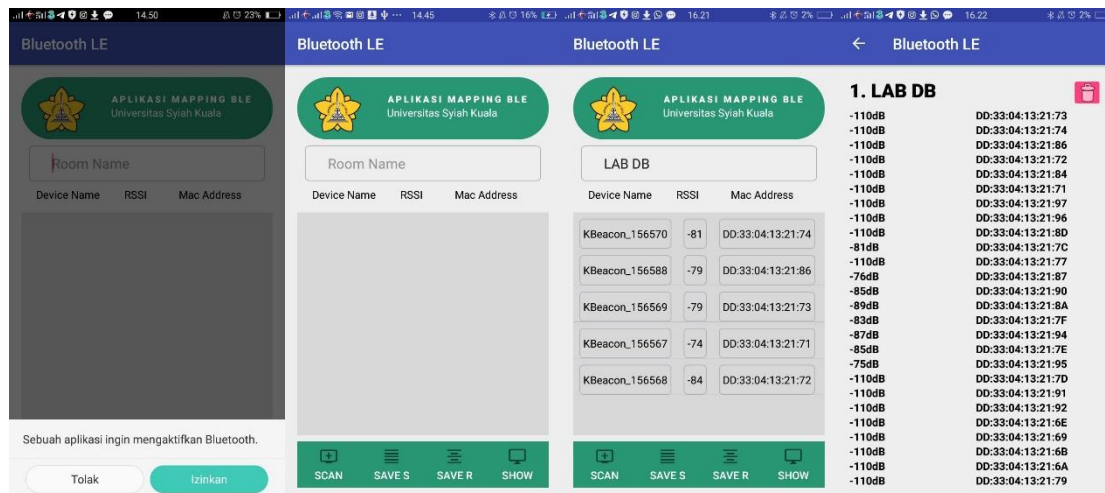


Figure 6: Mapping Application

3.3 Web Application

The web-based application is used to view and download recapitulated attendance data. This is normally used for administration and proof of performance for the lecturers. Figure 7 shows how the web-based application looks like.

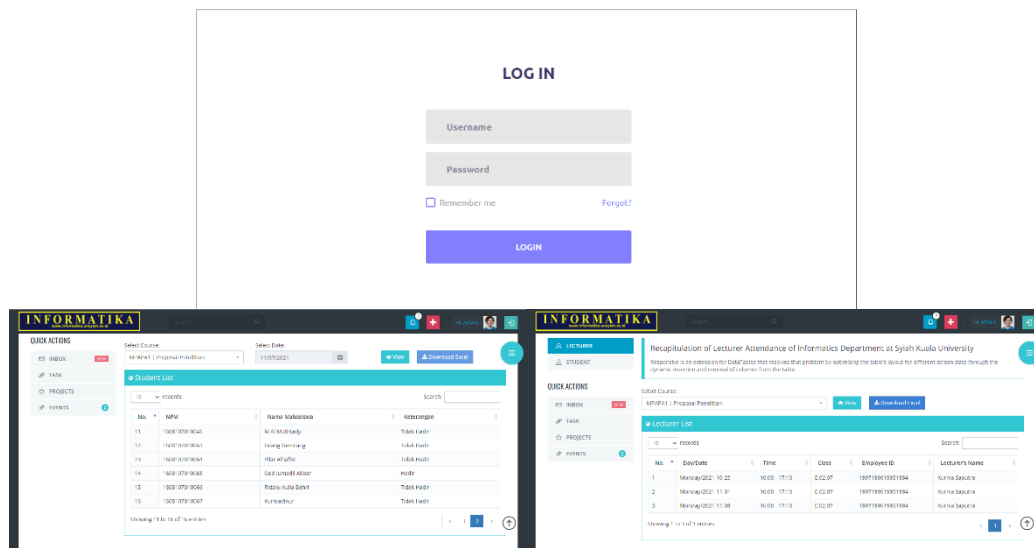


Figure 7: Web-based application

3.4 Students Mobile Attendance Application

Figure 8 shows the students' side of the application. Students can view and click attend on their side to record their attendance of certain classes.

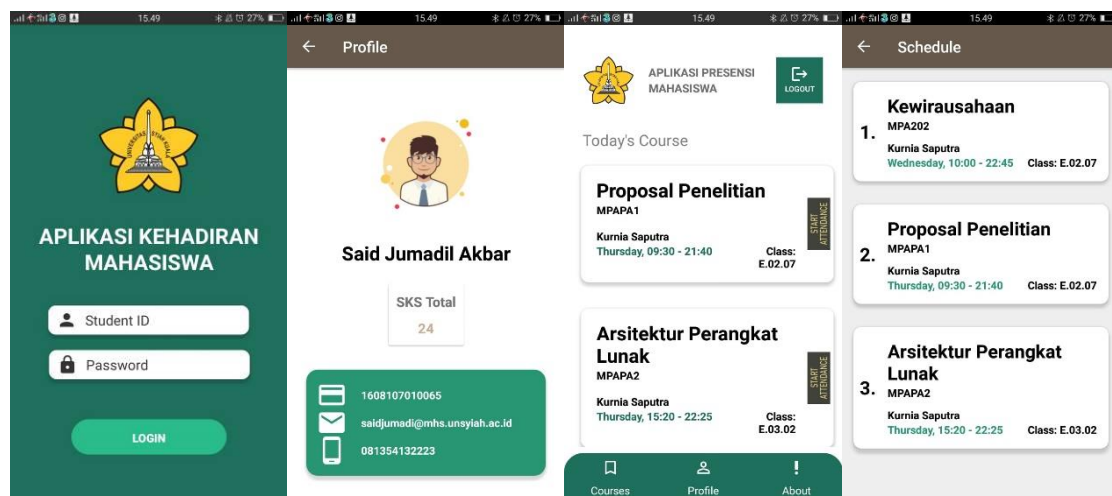


Figure 8: Students Mobile Attendance Application

3.5 Lecturers Mobile Application

Figure 9 shows the lecturers' side of the application. Lecturers can view subjects taught at the moment, check their schedule and can start the attendance process which will then be visible to the students.

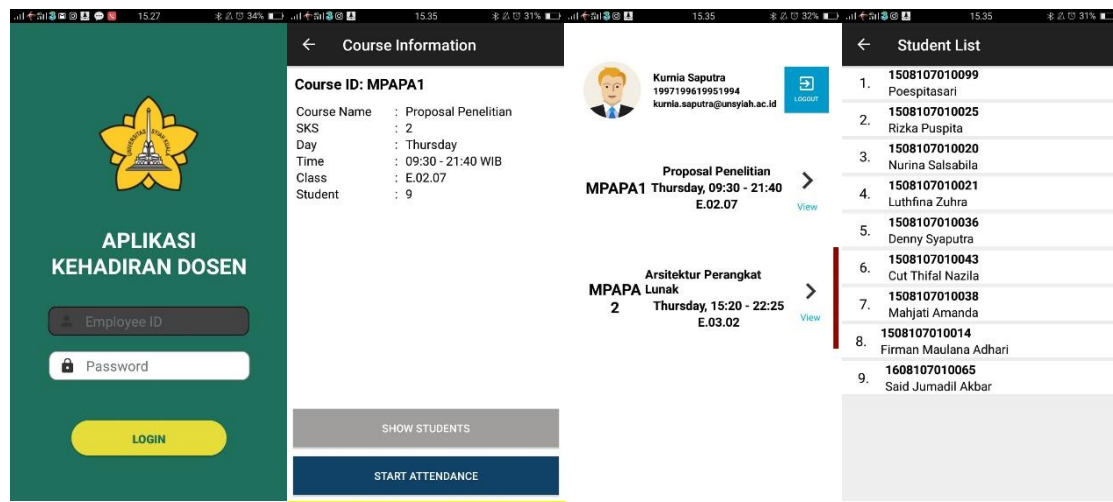


Figure 9: Lecturers Mobile Attendance Application

3.6 Accuracy Testing

The accuracy testing was analysed using SVM method with a Linear kernel type. This type of testing aims to analyse the mapping accuracy of BLE signal strength in the classrooms with beacons. The data used in this research is around 2960 BLE signal strength data from every reference point. From the 2960 data; it will be separated into two; 888 will be training data and the rest 2072 data will be testing data.

Table 3: Accuracy Data with SVM Classification

Classroom Label	Precision	Recall	F-Measure	Support
E.02.07	100.00 %	91.18 %	95.38 %	68
E.03.02	100.00 %	94.59 %	97.22 %	74
E.03.05	98.78 %	98.78 %	98.78 %	82
Database Lab	55.56 %	61.40 %	58.33 %	57
Computer Network Lab	78.95 %	83.33 %	81.08 %	72
Artificial Intelligence Lab	79.27 %	95.59 %	86.67 %	68
Multimedia Lab	87.76 %	88.89 %	88.28 %	72
GIS Lab	77.78 %	83.33 %	80.46 %	42
Computer and Operating Systems Lab	87.01 %	94.37 %	90.54 %	71
Outside perimeter of Building E	81.43 %	98.28 %	89.06 %	58
Outside perimeter of Building C	87.36 %	69.09 %	77.16 %	110
Outside perimeter of Building A	86.14 %	76.32 %	80.93 %	114
Accuracy	85.47 %			888
Macro Avg	84.99 %	86.26 %	85.32 %	888
Weighted Avg	86.09 %	85.47 %	85.45 %	888

Based on the results shown in table 3, it can be inferred that the average accuracy value that is produced from all BLE signals mapping data is 85.47%. The best F-measure is located in the classroom of E.03.05 with a value of 98.78%. This may be due to its proximity with the classrooms placed with beacons and the signals can reach into this classroom. The lowest F-measure in in the Database Lab, with a value of 58.33%. This is due to the fact that the Database Lab is the furthest from the rest of the classrooms.

3.7 Usability Testing with SUS

The 10 questions are then presented to the users after they have finished using the system. In this case, the application that were tested with its target user were the Students Mobile Attendance Application and the Lecturers Mobile Attendance Application. For each side, students and lecturers tested the applications respectively. The respondents for this usability testing were 9 lecturers from the Department of Informatics and 10 students from the Department of Informatics.

The results for the SUS questionnaire for the Students Mobile Attendance Application is shown in table 5. The students' side of the application achieved an average SUS score of 78.5%. Meanwhile table 4 shows the results of the questionnaire from the lecturers' side of the application, with an average score of 83.9%. Both scores fall under the "acceptable" category based on table 2 interpretation. The difference in scores is probably due to the number of respondents are different in each and there is a difference in functionalities in both sides of the application.

Table 4: SUS Results for Lecturers Mobile Attendance Application

Respondent	Question Code										SUS Score
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	
1	5	1	5	1	5	1	5	2	4	4	87,5
2	5	2	4	2	4	2	4	2	4	4	72,5
3	4	2	4	2	4	2	4	2	4	2	75
4	5	1	5	1	5	1	5	1	5	2	97,5
5	4	2	4	2	4	2	4	2	4	2	75
6	5	1	5	2	5	1	5	1	5	1	97,5
7	5	1	4	2	5	1	5	2	5	3	87,5
8	5	1	4	2	4	1	5	2	4	3	82,5
9	5	2	4	2	5	1	5	2	3	3	80
Average											83,9

Table 5: SUS Results for Student Mobile Attendance Application

Respondent	Question Code										SUS Score
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	
1	5	2	4	2	5	2	4	2	4	2	80
2	5	1	5	1	5	1	5	1	5	1	100
3	5	2	5	1	5	1	5	2	5	2	92,5
4	5	2	4	2	4	2	4	2	4	4	72,5
5	5	2	4	1	5	3	4	2	4	2	80
6	4	3	4	3	4	3	4	3	4	4	60
7	5	1	5	2	5	1	5	1	5	2	95
8	4	2	5	3	5	2	4	2	2	3	70
9	4	2	4	2	3	2	4	2	4	4	67,5
10	4	3	4	2	4	3	5	2	4	4	67,5
Average											78,5

4. CONCLUSION

To conclude, Indoor Positioning System has successfully implemented with SVM classification method to predict the location of users within a classroom in a building. The average accuracy value for all classrooms from the mapping data is 85.74%. The highest accuracy value from mapping data is obtained from classroom E.03.05 with an accuracy value of 98.78%. The lowest accuracy value is from the Database Lab, with a value of 58.33%.

SVM classification method has proven to have a higher accuracy value and better execution time compared to KNN classification method used in the previous Students' and Lecturers' Mobile Attendance Application developed by Sari [1].

The usability testing on both sides of the application yielded a score of 83.9% for the lecturers' side of the application and 73.9% for the students' side of the application. Both scores fall into the "acceptable category".

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I-CReST 2022:193-167 - Identification of Tree Species for Tropical Forest by Drone Aerial Image using Convolutional Neural Network(CNN) Model

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ABSTRACT

Identifying tree species before logging is one of the new initiatives to support the management of tropical forest activity. The marking of individual tree species in densely wooded environments is crucial for the inventory of forests because they are exceedingly cost-intensive based on time consumption and workforce. The use of drones in forestry applications and applying deep learning approaches for data processing are growing as they are more economical than satellite data. With drones, datasets can be captured flexibly and at high spatial and time resolutions when needed. In this project, the drone will capture the image of forests and create a custom dataset to train and predict the image of tree species from the air. The study activity is to collect images of forests and their species in Malaysia because the species in Malaysia are different from other countries. We used a Faster Region Proposal Convolutional Neural Networks (R-CNN) algorithm using Facebook Artificial Intelligence (AI) research Detectron2 for tree species object detection from high-resolution RGB drone data. Based on our proposed method, the result shows a good prediction model where we can see the prediction model for detecting tree species with almost 80% of ground truth data verification. This approach is practical because the technique focuses on commercial wood species that are easy to see in the forest landscape. This initiative will save the cost of unnecessary ground inventory and uneconomic timber operations. The success of this initiative could provide the first phase of the forest inventory, which will impact the feasibility of logging operations and sustainable forest management for the forest area.

Keywords: RCNN; Deep learning; drone images; tree species; tropical forest

1. INTRODUCTION

Modern Malaysian forest management, notably for timber production, focuses on maintaining and monitoring resources. The most important aspect of modern forest management in Malaysia, particularly for timber production, is the maintenance and monitoring of resources. Observing carbon stock and forest biodiversity, which are crucial climate change indicators, requires assessing tree biomass[1]. The detection and mapping of individual tree crowns contribute to the evaluation of forest growth, regeneration, and density. Marking trees with typical field survey techniques was a conventional practice[2][3]. It is determined that it could be utilized efficiently in forest management. By using drone technology, remote sensing could be used to look at what's going on in the forest using data from a previous inventory. The crown of a tropical forest is hard to define because this type of forest has a very complicated structure and has a lot of different species.

This is talked about in [4] where there is a dense canopy forest with a variety of plants in the understory.

2. MATERIALS AND METHODS

Most research on identifying tree species in tropical forests uses satellite data like Light Detection and Ranging (LiDAR) because remote sensing uses a large dataset that can help their research. Currently, remote sensing is frequently employed to investigate modern forest management activities. In the past, satellite data such as Light Detection and Ranging (LiDAR) were used extensively in tropical forest tree species identification research because remote sensing employs a huge dataset that can help their research. Based on past research[5], they compare the image quality, efficiency, and categorization precision of drone images and satellite images. The Setiu Wetland in Malaysia was the location of the investigation employing object- and pixel-based categorization techniques. Even on cloudy days, they discovered that drones gave images with the superior temporal resolution, a significant advantage for operating in humid tropical climates[6][7]. Meanwhile, Onishi et al.[8], They built a machine vision system that uses basic RGB images from a standard UAV to automatically classify trees. Based on an object-based method of sorting, they got training and test data from the Kamigamo Experimental Station of Kyoto University, which is in a natural forest near Kyoto, Japan. That worked to sort seven types of trees with an accuracy of 89.0 percent, but it couldn't tell each tree crown apart. This problem should be fixed by using a UAV drone and deep learning technology, which can be more accurate. According to [9], UAVs are advanced techniques and are capable of obtaining information from an aerial perspective. Using drone technology in conjunction with a computer vision approach is projected to provide a cost-effective alternative remote sensing tool for examining forest activity using pre-inventory data [10][4]. As we know, tropical forests have a lot of categories between species and individual tree structure. Many researchers tried to find the best techniques to automate tree crown segmentation even though they faced with many challenges related how to manipulate data from the trees.

2.1 Study site and Data Acquisition

A survey was done in the Cherul concession area located at Kuala Dungun Terengganu, handled by Kumpulan Pengurusan Kayu Kayan Trengganu Sdn. Bhd (KPKKT). KPKKT is in charge of a 129,140-hectare long-term forest concession in the state of Terengganu on the east coast of Peninsular Malaysia. This consists of 109,716 hectares of the Dungun Timber Complex (DTC) and 19,714 hectares of the Cherul Forest Concession (CFC). KPKKT is the only firm in the world to have managed the tropical rainforest under the Malaysian Selective Management System for the first 25 years (SMS).

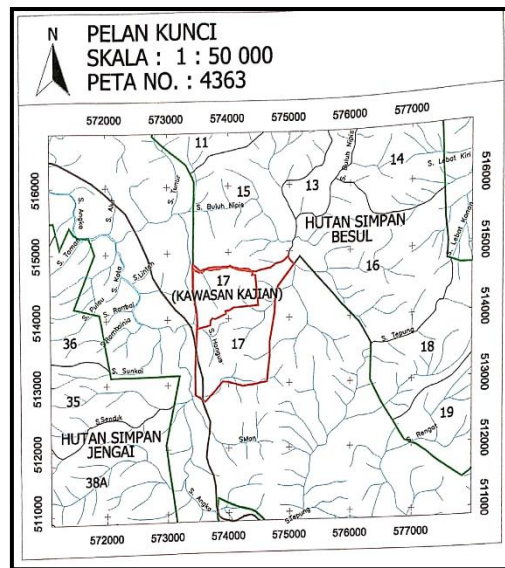


Figure 1: The geographic position of drones flight mission around Hutan Simpan Jengai, Dungun Terengganu

The DJI Phantom 4 Pro is equipped with a 1-inch, 20-megapixel sensor for image capture. For our experiment, the drone is flown to a height of between 50 and 180 metres, and the images are captured right below the drone.



Figure 2: The flight missions captured images from different sites

3. EXPERIMENTAL SETUP

In this research, we use FAIR's (Facebook AI Research) Detectron 2 for object detection on a custom dataset that involves object detection for tree species in a tropical forest in Malaysia.

3.1 Data Pre-processing

Convolutional neural networks (CNNs) have been one of the most significant new ideas in computer vision. They've outperformed traditional computer vision and produced cutting-edge outcomes. Detecting tree objects in high-resolution images has become a major focus of recent

research on CNNs. Previous research has shown us that CNN is a neural network that has a specific topology. It uses a grid-like arrangement to analyze the data and then extracts the most important qualities. It is a huge advantage to use CNNs because they don't require considerable image processing. When it comes to image analysis, CNN is a computationally efficient model with specialized convolution and pooling techniques. For object detection, faster RCNN because it able to retrieves low-level image features by running an input image through a backbone (sub-)network. The RPN and ROI head share the features. The ROI head (sub-)network obtains and classifies features from 2000 proposal boxes generated by the RPN[12][13].

3.2 Proposed Research Pipeline



Figure 3: The step by step workflow for proposed methods

3.3 Deep Learning for Object Detection

Deep learning is a part of machine learning algorithm consist of artificial neural networks. It beneficial to researcher who look into the task with collecting, analysing and interpreting large amount of data.[14][15] The application of deep learning approaches for tree detection from high-resolution photography is expanding rapidly, and the faster R-CNN method has been utilised in a handful of research on the subject. In object detection, a model predicts the locations of objects and their classes such as cat or dog. Figure 3 depicts the experimental workflow in detail. The activity began with data preprocessing, during which the dataset was divided into training, validation, and testing. Since all images are raw data and lack information on the types of tree species present, we must label the images prior to training the model. The labelling process was done with the open-source annotating application labelImg, which is a tool for putting notes on visible objects by defining a bounding box around the object. This information is saved in PASCAL VOC, which is an XML format. Then, these annotations can be turned into a JSON file in the COCO format, which Detectron2 can read. Then, the Roboflow application (<https://roboflow.ai>), which makes it easier to prepare data and train robots, was used. In this experiment, we labelled SpeciesB and SpeciesC as our custom dataset because it is impossible for specialists from KPPKT to identify the precise name of a species from images captured by drones. We will train a model for detecting tree species from a model that has already been trained on the COCO dataset and is available in detectron2's model zoo[16]. The images were resized to 416x416 pixels, which is the same size as the input image for the pre-trained network. Before feeding

the data into the network, the images and their labels were mixed up together. This is because it is important to mix up the input data in order to make the neural network more general. So, we could stop the network from learning from small groups of highly related training images as a whole. We used a learning rate of 0.0001 and a total of 3000 epochs to train the machine[12][17].

4. RESULT AND DISCUSSION

4.1 Result of Training Images

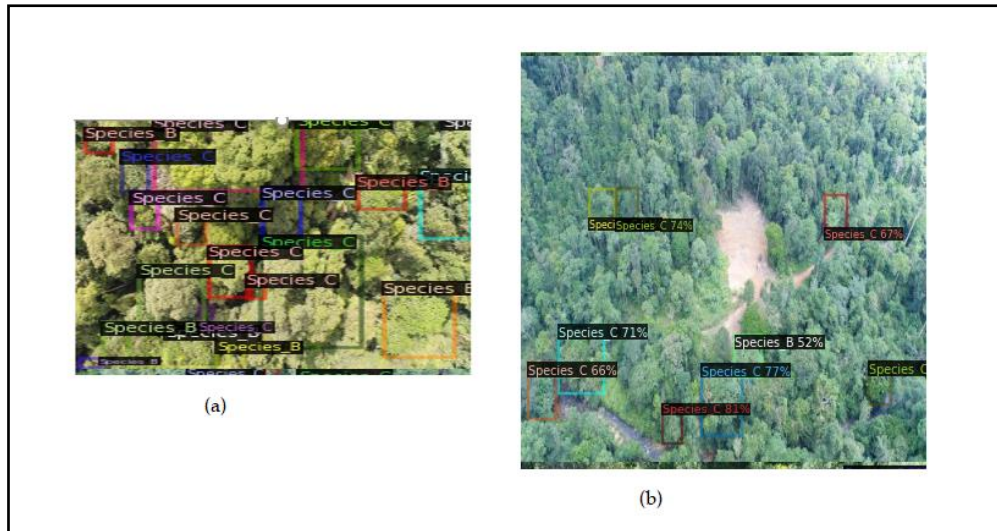
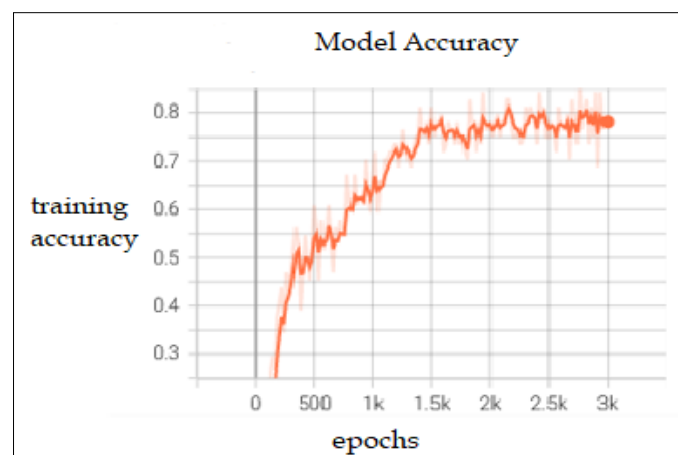
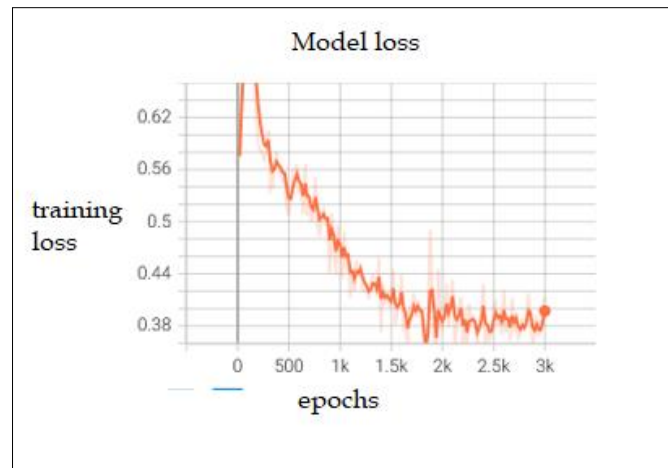


Figure 4: (a) Target from ground truth and (b) object detection result after validation process

In the training step, we tell the model how to be set up and get ready to get to know it. Technically, we use the dataset to fine-tune our model, which has already been trained on the COCO Dataset. In Detectron2's Model Zoo, there are many models that can be used to find objects. We used the faster RCNN R 50 FPN 3x model for this test. The figure 4 (a) shows the target from the ground truth, and figure 4 (b) shows the image prediction after the evaluation process. If we feed an image of a tree into an object detection system, we can see what it might do. We can see that the model has figured out where nine objects are by drawing a rectangle around them. It has also correctly put them into speciesB and speciesC classes.





```

Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.044
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.106
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.004
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.002
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.152
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.070
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.025
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.066
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.084
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.060
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.194
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.225
[01/20 07:51:14 d2.evaluation.coco_evaluation]: Evaluation results for bbox:
| AP | AP50 | AP75 | APs | APm | AP1 |
|:---:|:---:|:---:|:---:|:---:|:---:|
| 4.409 | 10.566 | 0.366 | 0.223 | 15.197 | 7.030 |
[01/20 07:51:14 d2.evaluation.coco_evaluation]: Per-category bbox AP:
| category | AP | category | AP | category | AP |
|:---:|:---:|:---:|:---:|:---:|:---:|
| SpeciesBC | nan | Species_B | 4.554 | Species_C | 4.264 |
OrderedDict([('bbox',
  {'AP': 4.409181989627533,
   'AP-SpeciesBC': nan,
   'AP-Species_B': 4.554455445544553,
   'AP-Species_C': 4.263908533710513,
   'AP50': 10.565770862800566,
   'AP75': 0.365983026874116,
   'AP1': 7.029702970297031,
   'APm': 15.197158846319411,
   'APs': 0.22277227272727272}]))

```

Figure 5: Plots showing training loss and accuracy based on average precision and average recall

For prediction, we saved a separate set of 6 images with 17 images for speciesB and 25 images for speciesC that were not used for training. Figure 5 shows a graph of the accuracy and training loss. The labels that were guessed were judged by how close they were to the real labels. The results show that the overall accuracy of the classification was close to 80%. In addition to accuracy, other measures are also calculated, such as Precision, Recall, and mAP[16][12]. Precision tells how likely it is that the correct number of positive images were picked out of the total number of positive images. Coco evaluation gives the average precision for classifying things into more than one group. The COCO Challenge takes it a step further by evaluating mAP at different thresholds that range from 5% to 95%. The confidence factor, on the other hand, is different for each model for example it might have 50% confidence in our model design, but someone else might have 80% confidence in theirs. This would change the shape of the precision recall curve. Object identification models that use computer vision are

judged by their mean average precision. Mean average precision measures how well our model can predict bounding boxes at a certain level of confidence (mAP@0.5 or mAP@0.95). The intersection over union (IoU) is 1.0 if a forecast box perfectly overlaps the ground truth label[12].

5. CONCLUSION

The result as discussed in result analysis showed the drone technology together with deep learning able to produce a greater production compared to traditional ground methods. Later, several algorithms such as instance image segmentation and deep learning model such as a pre-trained Mask RCNN (Mask Region-based Convolutional Neural Network) methodology with transfer learning will be explored for the segmentation and identification of crown image and its species prediction to get more accurate result. Overall, the performance accuracy of the Cherul Forest Reserve's classification of dominant tree species might be enhanced employing more deep learning approaches. Flat and oblique views of objects, difficulty categorising data, and high image sizes provide obstacles and limits for automating the use of aerial imagery in this research. We utilise preprocessing approaches to aerial imagery to prepare it for our model training phase in order to avoid this issue. It entails cropping photographs at various resolutions, angles, and positions in order to make our training adaptable to these alterations. The problem with dividing up photos is that the same thing may appear in two separate views, posing significant obstacles for tropical forests in terms of object overlap. It causes double detection and inaccuracies in object counts. In addition, certain items that are very close to one another may have overlapping bounding boxes during detection. One solution to this issue is to upsample or zoom in via a sliding window in order to locate small, densely packed items. This is because tropical forests have many different tree species that are close to each other. So it is hard to tell the different in the structure of the canopy in tropical forest. Also, the tree in the site study don't stand together by species and there are many different species in one area.

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I-CReST 2022:201-199 - The Relationship between Mathematics Anxiety, Attitude towards Mathematics and Mathematical Thinking among Mathematics Education Students at UiTM Puncak Alam

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ABSTRACT

Since the primary level of education in Malaysia and even worldwide, mathematics has been acknowledged as an important and fundamental subject among others. However, in the recent years, there were also discussions and debates on the performance and interest towards mathematics subjects among the students. A thorough study should be done to prevent future generation from becoming a non-mathematical thinking nation. Among the important role in education process is the pre-service teachers who will be the real educators. Hence, the objective of this study is to investigate the relationship between three mathematical aspects which are mathematics anxiety, attitude towards mathematics and mathematical thinking among mathematics education students who are also the pre-service teachers. The study also explored the relationship between gender and mathematics attitude. The study that was done in 2020 involved 62 mathematics education students from UiTM Puncak Alam who responded a set of questionnaires consists a total of 46 questions in three sections which are mathematics anxiety (13 questions), mathematics attitude (17 questions) and mathematics thinking (16 questions). The data was analysed using Statistical Package for Social Science (SPSS) version 20.0 software. The result from correlation analysis revealed that there is a significant relationship between mathematics anxiety, attitude towards mathematics and mathematical thinking among mathematics education students. However, T-test analysis indicated that there is no significant difference between gender and mathematics attitude among the respondents. In conclusion, actions should be taken to reduce the major effects of mathematics anxiety on attitude towards mathematics and mathematical thinking skills.

Keywords: Mathematics anxiety; attitude towards mathematics; mathematical thinking; pre-service teachers

1. INTRODUCTION

Mathematics has always been perceived as a difficult subject that can lead students feeling afraid of mathematics and avoiding to answer mathematics questions. In relation to this, there are three mathematical aspects which are mathematics anxiety, attitude towards mathematics and mathematical thinking that can influence students in learning mathematics. However, what are mathematics anxiety, attitude towards mathematics and mathematical thinking? Generally, mathematics anxiety synonyms with emotional or feelings of tension when facing

mathematical problems. Some students lack of interest, being anxious towards mathematics including the avoidance of mathematics and declining in mathematics achievement [1]. As a result, most students who are suffering from negative anxiety usually reject to enrol in mathematics courses. A study revealed that the feelings of mathematics anxiety are increasing to 80%, especially for community college students [2]. The impact is that they would avoid to solve mathematical problems and taking it negatively.

Mathematics attitude may positively or negatively affect student achievement and mathematical skills which defined as an emotional, behavioural and perceptions with abilities in mathematics. For example, students' value, self-confidence, motivation, enjoyment and anxiety level [3]. The implication of mathematics attitude is increasing especially in the development of behaviour and education. Students who are having negative attitude towards their learning process related to mathematics avoidance would simply give up without trying and delay the task of doing it. Sometimes, they resist to do amendment and studying that can affect their vision of learning in mathematics. This situation explained that there is a relationship between students' discipline and negative attitude towards mathematics [4].

Mathematical thinking is defined as cognitive development by analysing, exploration and collaboration of mathematics such as problem solving, reasoning and proof [5]. Mathematical thinking is also connected to circumstances based on mathematical experiences, discussion of problem solving and understanding of mathematical concept.

In view to a group of mathematics education students who are the pre-service mathematics teachers themselves, the questions arose, is there any significant relationship between mathematics anxiety, mathematics attitude and mathematics thinking among mathematics education students? Is there any significant difference between gender and mathematics attitude among mathematics education students? Therefore, the objectives of this study are to investigate the relationship between three mathematical aspects which are mathematics anxiety, attitude towards mathematics and mathematical thinking among mathematics education students who are also the pre-service teachers and to explore the relationship between gender and mathematics attitude.

2. LITERATURE REVIEW

Mathematics anxiety, attitude towards mathematics and mathematical thinking are the main concern in achieving a good academic performance among mathematics education students. For example, the higher negative anxiety can delay students' performance, attitude and thinking skills in mathematics especially formulas, problem solving and decision making. When students have good and positive experience in learning, then they would be able to develop their cognitive skills, maintain a good attitude and solve mathematical problems with a low level of anxiety. The students who are lack of confidence and unmotivated could contribute to mathematics anxiety especially in solving mathematical problems [6]. A significant relationship between anxiety, attitude and thinking towards mathematics leads to students' motivation, passion and achievement in the learning process [7]. The students need to increase their academic performance with a balance emotion, behaviour and anxiety that certainly leads to success. It is revealed that mathematics anxiety, attitude towards mathematics and mathematics thinking are dependent to each other and give impact towards academic performance [8].

Fear and uneasy have always been the feelings in learning mathematics especially when it comes to deal with specific situations [9]. It can influence students to build the border limit on their abilities to do mathematical problems. There are several symptoms of mathematics anxiety which are trauma response, insecure, inactive and poor self-esteem. Every student may have similar anxiety problems or symptoms but whether or not they take any action in order to deal with the problems in mathematics.

Attitude towards mathematics is another important variable in learning process. Most students often misunderstanding mathematics subject such as formulas, numbering and proof reasoning. It is about students' motive and goals towards mathematics, but some of them often reluctantly respond or volunteer towards mathematics subject. This happens because they have blocked their cognitive mind and put a limit towards mathematics. For example, students who are with higher self-esteem can influence their positive academic performance and interest towards mathematics subject. Students are able to develop their positive attitude, belief and increase their cognition when accepting mathematics as interesting subject [10]. Students who have a low level of confidence and feels scare, may not achieve and experience enjoyment and scoring a good academic achievement in mathematics subject. Attitude and anxiety are related, which students having trouble such as nervous, anxious and insecure which can lead towards their negative attitude, cognition and achievement in mathematics [7].

Mathematical thinking focuses on critical and creative thinking. It is a process of information by developing new ideas and solutions related to situations. Thinking also can contribute to students' performance and anxiety towards mathematics.

Gender differences with attitude towards mathematics could affect towards students' achievement in different learning process. However, there have been different findings on gender differences in attitude towards mathematics. A study found that female students use their cognitive more in order to think [11] and develop their own ideas and strategies, especially to gain their understanding towards mathematics. A contrary study found that male students perform better in mathematics score than female which happen because most female students have less interest and difficulty in understanding mathematical concepts [12]. On the other hand, another non-biased finding revealed that there is no relationship between gender and mathematics attitude which do not affect their mathematics achievement [13].

3. THEORETICAL FRAMEWORK

This study was guided by a theorist who is Jean Piaget which focused on students' cognition, behavioural and emotion towards learning mathematics. Jean Piaget theory described that students' cognitive development can affect creativity and critical skills through searching, analyse, construct and apply. Piaget's (1936) theory of cognitive development discussed that students are able to present their new ideas and construct understanding of concepts based on environmental experiences. Based on this statement, there are three stages that enable changes from one part to another during adaption processes which are assimilation, accommodation and equilibrium [14].

Assimilation defined as students need to adapt or deal with new situation or environment with existing scheme or pattern in order to solve mathematical problems [15]. If students unable to deal or existing pattern does not work in order to apply in certain situation, then they need

to figure out new ideas or creative solution. This situation is called as accommodation which means need to be changed depends on new or certain situation [16].

Next, equilibrium stated as a process of balancing between students' cognitive and environmental [17]. Equilibrium happens when students need to solve or deal on new situation with assimilation or accommodation by mastering new challenge knowledge and increasing their development of cognitive.

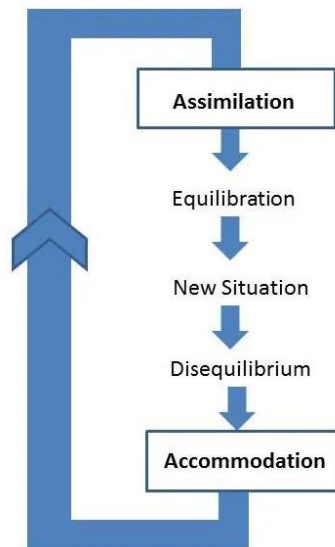


Figure 1: Process of amendment

4. METHODOLOGY

This study was done by using a quantitative approach. The type of questionnaire items used in the research instruments are single-choice item and Likert-type item. Before the real study was conducted, a pilot study was done with a small number of test respondents. In a pilot study, the number of test participants should be 10% of sample size [18]. Considering that, there were 15 respondents who was taking mathematics as an elective subject have been selected to complete the questionnaires in the pilot study.

Cronbach's alpha reliability were used in quantitative research to achieve the credibility and true value result of study by using the reliability command in Statistical Package for Social Science (SPSS) version 20.0. The Cronbach's alpha reliability method is frequently used in order to test and determine the result of internal consistency of an instrument which consists multiple Likert-type questions that determine if the scale is accurate and reliable. The internal consistency reliability coefficient that determined whether or not there is a higher reliability. If the average inter-item correlation increases then Cronbach's alpha increases as well. Cronbach's alpha and internal consistency is shown in Table 1.

Table 1: Cronbach's alpha and internal consistency [19]

Cronbach's Alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

After doing the pilot study, it was found that all of the test respondents understand clearly the interpretation of questions. The questionnaires have four sections which are demographic information, mathematics anxiety questions, mathematics attitude questions and mathematics thinking questions. For demographic section, the questionnaire asked about respondent details such as gender, age and semester. Mathematics anxiety section involved 13 questions that can find out the true motives and feelings of respondents. Mathematics attitude section involved 17 questions. Mathematics thinking section which is to identify the level of thinking of the respondents involved 16 questions. The respondents involved in this study were mathematics education students who were also the pre-service teachers at UiTM Puncak Alam, Selangor. The data was analysed by Statistical Package for Social Science (SPSS) version 20.0 to achieve validity and reliability.

5. RESULTS AND DISCUSSION

Figure 1 shows that 61 respondents which 15 (24.2%) male and 46 (74.2%) female with different age and semester participated in this study, which came from mathematics education students at UiTM Puncak Alam.

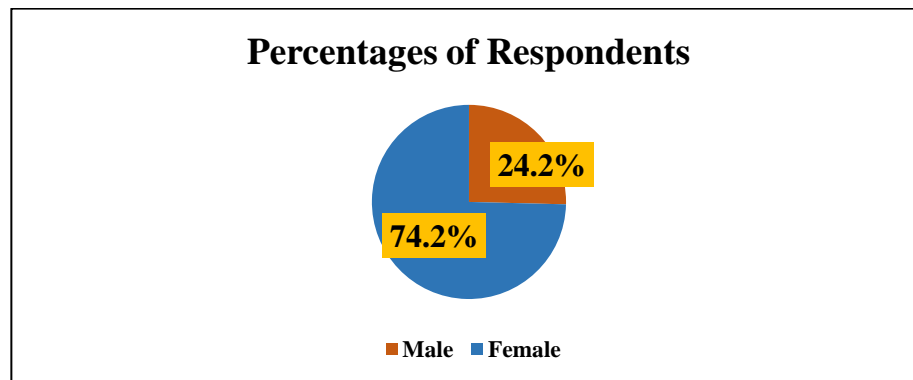


Figure 1: Gender Percentage of mathematics education student

Further analysis was done to answer the following research question:

Is there any significant relationship between mathematics anxiety, mathematics attitude and mathematics thinking among mathematics education students?

Table 2a: Descriptive statistics for Mathematics Anxiety, Mathematics Attitude and Mathematics Thinking

		ANXIETY_TOT	ATTITUDE_TOT	THINKING_TOT
N	Valid	62	62	62
	Missing	0	0	0
Mean		42.48	68.35	59.94
Median		42.00	69.50	59.00
Std. Deviation		11.381	9.721	6.847
Skewness		-.149	-.647	.424
Std. Error of Skewness		.304	.304	.304

From Table 2a, the descriptive statistics for mathematics anxiety, mathematics attitude and mathematics thinking are 42.48, 68.35 and 59.94 respectively. The median values obtained are 42.00, 69.50 and 59.00 respectively. The standard deviation for mathematics anxiety, mathematics attitude and mathematics thinking are 11.381, 9.721 and 6.847 respectively. The skewness coefficient shows that -0.149, -0.647 and 0.424 respectively which attitude is very far than zero value. However, there are two skewness had been found which are between -0.5 and 0.5, indicated that the distribution is approximately symmetric and for the skewness between -1 and -0.5 indicated that the distribution is moderately skewed. To determine if there is any significant relationship in these variables, correlation analysis was conducted.

Table 2b: Correlations for Mathematics Anxiety, Mathematics Attitude and Mathematics Thinking

		ANXIETY_TOT	ATTITUDE_TOT	THINKING_TOT
ANXIETY_TOT	Pearson Correlation	1	.606**	.326**
	Sig. (2-tailed)		.000	.010
	N	62	62	62
ATTITUDE_TOT	Pearson Correlation	.606**	1	.589**
	Sig. (2-tailed)	.000		.000
	N	62	62	62
THINKING_TOT	Pearson Correlation	.326**	.589**	1
	Sig. (2-tailed)	.010	.000	
	N	62	62	62

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

The results of Table 2b have revealed that there is a relationship between mathematics anxiety, mathematics attitude and mathematical thinking which the mean score for mathematics anxiety was 42.48 while mathematics attitude attained mean score was 68.35 and the mean score for mathematics thinking was 59.94. Then, the report stated that there is a significant relationship between mathematics anxiety, mathematics attitude and mathematical thinking among mathematics education students. The findings were supported by [20] which showed that there is a significant relationship and negative correlation between mathematics anxiety and attitude towards mathematics. Overall, the relationship between mathematics anxiety, mathematics attitude and mathematics thinking proved that increasing negative anxiety can delay students' performance, bad attitude and low level of thinking skills in learning mathematics especially when involving formulas, solving problem and making decision.

Another research question was:

Is there any significant difference between gender and mathematics attitude among mathematics education students?

Table 3a: Descriptive statistics based on Gender and Mathematics Attitude

		Gender	ATTITUDE_TOT
N	Valid	61	62
	Missing	1	0
Mean		1.75	68.35
Median		2.00	69.50
Std. Deviation		.434	9.721
Skewness		-1.210	-.647
Std. Error of Skewness		.306	.304

Table 3a indicated that the descriptive statistics between gender and mathematics attitude are 1.75 and 68.35 respectively. The median values obtained are 2.00 and 69.50 respectively. Next, the standard deviation between gender and mathematics attitude are 0.434 and 9.721 respectively. The skewness coefficient shows -1.210 and -0.647 respectively. However, the skewness which is between -1 and -0.5 indicated that the distribution is moderately skewed. T-test was conducted to determine if there is any significant difference in these variables.

Table 3b: Students' Information

	Gender	N	Mean	Std. Deviation	Std. Error Mean
ATTITUDE_TOT	Male	15	71.67	8.423	2.175
	Female	46	67.04	9.904	1.460

Table 3c: T-test based on Gender and Mathematics Attitude

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ATTITUDE_TOT	Equal variances assumed	.314	.577	1.624	59	.110	4.623	2.846	-1.073	10.319
	Equal variances not assumed			1.765	27.715	.089	4.623	2.620	-.745	9.992

The findings of independent sample T-test in Table 3c indicated that male respondents show higher attitude towards learning mathematics with mean score 71.67 compared to female respondents with mean score 67.04. There is no statistical difference between gender and mathematics attitude among mathematics education students in this study. This is in line with [21] which also revealed that there is no significance relationship between males and females in mathematics attitude that can influence students' ability and academic achievement. In other words, male and female students have similar mathematics attitude in learning. For this reason, independent sample T-test is an appropriate method to determine if there exist significant difference between two independent groups.

6. CONCLUSION AND RECOMMENDATION

As a conclusion, the results stated that there is a relationship between mathematics anxiety, attitude towards mathematics and mathematics thinking among mathematics education students. Anxiety will affect the attitude and the courage to think mathematically. However, a better result was on the gender differences which indicated that gender should not be a reason for anyone's achievement in their study in mathematics or even in any other subjects. Lastly, hopefully this research could give some awareness related to teacher-to-be on their mathematics anxiety level, attitude towards mathematics and mathematical thinking before entering the job as teachers, in order to achieve good academic performance, whether among themselves as students or as teachers to guide their future students.

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I-CReST 2022:201-201 - The Factors of Mathematics Anxiety and Attitude towards Mathematics among Mathematics Education Students at UiTM Puncak Alam

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ABSTRACT

The importance of mathematics as a fundamental subject is well known by almost everyone. In the development of mathematics thinking, the educators play an important role. The educator-to-be who are known as pre-service teachers should be well prepared before entering the real career to guide their students in achieving the learning outcomes. However, the anxieties, attitudes, belief and thinking could also affect in mathematics achievement [1]. Hence, this study is to explore the factors of mathematics anxiety and the effects of mathematics attitude in learning mathematics among mathematics education students themselves before becoming a teacher. The study was done through telephone interviews in 2020. There were six mathematics education students from UiTM Puncak Alam who were the respondents in the individual interview sessions. Thematic analysis was applied to study the findings which revealed that negative experience, misconception and poor self-esteem were the factors of mathematics anxiety. The conditions influence them to feel insecure in solving mathematical problems as learners and also as trainee teachers when facing their good students. In conclusion, all of the six students experienced negative anxiety and attitude which has affected them in learning especially as mathematics education students.

Keywords: Mathematics anxiety; attitude towards mathematics; mathematical thinking; pre-service teachers

1. INTRODUCTION

Mathematics is defined as a numerical subject such as shape, quantity, change and structure in any education curriculum [2]. Mathematics also is defined as central part of knowledge that content of effective ways in increasing cognition, mental discipline and encourage understanding the concepts in learning process [3]. Mathematics need much energy which cognitive is accordance to solve mathematical problems. Researchers stated that most students enter universities with low mathematical skills [4]. However, what are the factors of mathematics anxiety that influence students in mathematics achievement? What are the effects of mathematics attitude that influence students in learning mathematics? In relation to that, the objective of this study is to explore the factors of mathematics anxiety and the effects of mathematics attitude in learning mathematics among mathematics education students who are also the pre-service teachers.

Generally, mathematics anxiety means the presence of a syndrome of emotional actions towards arithmetic and mathematics, including a situation which negative experience in working with mathematics and mathematics concepts [5]. The students lack of interest, being anxious towards mathematics including the avoidance of mathematics and decline in mathematics achievement [6]. As a result, most students who are suffering from negative anxiety usually reject to enrol in mathematics courses. Anxiety also can lead to decrease in mathematics performance and achievement [6]. Another study also shown that the feelings of mathematics anxiety are increasing to 80%, especially for community college students [7]. The impact is that they would avoid to solve mathematical problems and taking it negatively.

Mathematics attitude is defined as an emotional, behavioural and perceptions with abilities in mathematics. Attitude can affect students' motivation and enjoyment in learning mathematics which motivation is an interest or spirit that pursue students to desire and focus on the track especially in mathematics [8]. For example, students' value, self-confidence, motivation, enjoyment and anxiety level [9]. The implication of mathematics attitude is increasing especially in the development of behaviour and education [10]. These issues will affect the students in mathematics achievement and learning mathematics.

2. LITERATURE REVIEW

Mathematics anxiety synonyms with emotional or feelings of tension when facing mathematical problems. It can influence students to build the border limit on their abilities to do mathematical problems. There are several symptoms of mathematics anxiety which are trauma response, insecure, inactive and poor self-esteem [11].

Students who are having trauma response would feel powerless and helplessness especially when it comes to mathematics. The students will think that they never do better, not good enough and inability to solve mathematical problems.

Insecure means that the students having misconception and thought everyone around them know the answers and do better than them in mathematics. For example, students felt down and isolated towards their low academic achievement.

Additionally, students who are inactive person or passive often sit back and do not take any action but they would do nothing and be silent in the classroom.

Another condition is poor self-esteem which is also known as lack of confidence. Poor self-esteem can influence students in learning process and academic achievement which they have feeling of tension and worries especially when they need to present and explain their working solution. In fact, every student has similar anxiety problems or symptoms but whether or not that they are being proactive to overcome and deal with the problems in mathematics.

Reading and being aware of mathematics anxiety lead us to questions, what are the factors of mathematics anxiety that influence students in mathematics achievement? There are factors of mathematics anxiety that found in previous studies which are negative experience and learning method. There are many negative anxieties due to bad experiences especially learning mathematics. Some of students having bad experiences when they were in elementary schools such as lack of support and encouragement from parents and teachers. Other researchers also

found that female students have worse experiences in learning mathematics than male students [12]. The type of teaching or learning method also can give impact towards students' achievement. This happens because the higher level of anxiety can influence students' understanding and motivation [13] due to less effectiveness of learning method. Additionally, students do not take any action towards their test preparation and almost no desires or motivation in learning mathematics.

Attitude is related to cognitive skills with students' perception, belief and emotions in learning mathematics. It is about students' motive and goals towards mathematics, but some of them often reluctantly respond or volunteer towards mathematics subject. This happens because they have blocked their cognitive mind and put a limit towards mathematics. Then, behavioural also part of attitude component that inclination to respond in learning mathematics. For example, students who are having higher self-esteem could have positive academic performance and interest towards mathematics subjects. What are the effects of mathematics attitude that influence students in learning mathematics? Some students are having difficulty in understanding concepts and increase their cognitive skills due to ineffective instructional and teaching method in delivering contents and explanations. Therefore, the supportive teaching method may lead to rise academic achievement [14] and develop positive attitude especially in mathematics. Besides that, students who are having low level of confidence and feels scared may not achieve and experience enjoyment and scoring a good academic achievement in mathematics subject. A study revealed that self-esteem and importance of mathematics are linked to each other [15]. Attitude and anxiety are related, which students having trouble such as nervous, anxious and insecure can lead towards their negative attitude, cognition and achievement performance in mathematics. Lastly, students who are having negative attitude towards their learning process related to mathematics avoidance simply given up without trying and delay the task of doing it. Sometimes, they resist to do amendment in their study that can affect their vision of learning in mathematics.

3. THEORETICAL FRAMEWORK

This study was guided by a theorist who is Albert Ellis' Rational-Emotive Theory which focused on students' cognition, behavioural and emotion towards learning mathematics. Albert Ellis' Rational-Emotive Theory known as ABC model of attitudes which A for affective, B for behavioural and C for cognitive. This theory explained that students' behavioural and emotion affect each other in learning mathematics due to ABC model had been supported by [16].

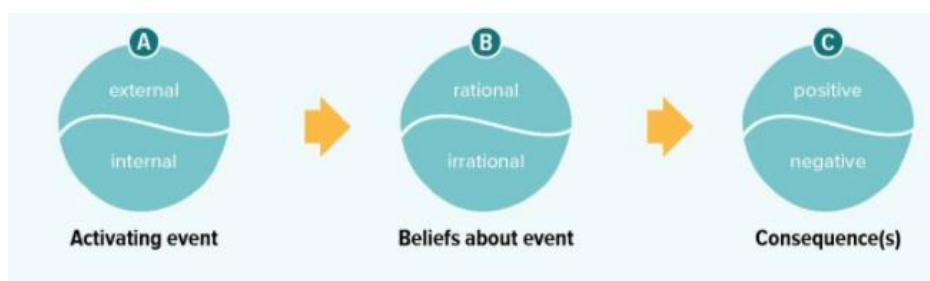


Figure 1: ABC model [17]

ABC model theory described that the connection between these objects is mutually dependent. If students unable to focus or respond towards emotional then it can develop students' negative behavioural and low level of thinking.

4. METHODOLOGY

The qualitative instrument was done through telephone interview sessions in 2020 (during Movement Control Order period due to Covid-19 pandemic). Using telephone call as a qualitative instrument is common and been considered as a lower alternative to face-to-face interview [18]. Using telephone interview tends to cost reasonable, short period of time and easier to conduct than face-to-face. Telephone interview also can create a strong relationship and foster communication in face-to-face sessions. The disadvantage is that the data may lack of validity because the behaviour and facial expression of the respondents cannot be viewed. The telephone interview sessions were done by using semi-structured interview approach. Semi-structured interview involves structured and non-structured interviews. In this semi-structured interview, interviewer did not only ask the questions consecutively but also have the freedom to question and explore the answers given by the respondents in more details. There were six mathematics education students at UiTM Puncak Alam who were randomly chosen for the telephone interview. The process of telephone interview was done based on the book titled Mastering Research Method [19]. All the questions were asked in the same chronological order to maintain consistency within the interviewing process. The telephone interview was conducted in English. The type of data analysis in this qualitative method was thematic analysis. Thematic analysis is using thematic schema by going through sentences to uncover themes. There were two themes which have been developed, the factors of mathematics anxiety that influence students in mathematics achievement and the effect of mathematics attitude that influence students in learning mathematics. For every telephone interview session, the respondents were been asked for permission to record the voice as reference data. The interview questions were:

1. *Do you know what is mathematics anxiety?*
2. *Did you experience fear of mathematics and avoiding to solve mathematics problems? If yes, what are the factors of mathematics anxiety that influence students in mathematics achievement?*
3. *Have you heard that anxiety and attitude towards mathematics are important and related to achievement?*
4. *Do you know what is mathematics attitude?*
5. *Did you experience lack of confidence when it comes to mathematics? If yes, what is the effect of mathematics attitude that influence students in learning mathematics?*
6. *What are the challenges as a student in learning mathematics?*
7. *Based on your opinion, do you think communication can help students to improve their level of thinking in mathematics?*
8. *Do you think that having positive attitudes or anxiety can help you in improving level of thinking in mathematics?*

5. FINDINGS AND DISCUSSION

The interview was done through telephone interview session in 2020. There were six students selected as respondents. There were many responses from the respondents that the researcher collected. The interview discovered the factors of mathematics anxiety that influence students

in mathematics achievement. The finding revealed that most students have experienced fear of mathematics and avoiding to solve mathematical problems.

5.1 Negative Experience

From the study, there were six respondents have experienced fear of mathematics and avoiding to solve mathematical problems. It shows that mathematics education students faced difficulty to understand and cope to teaching skills. It clarified that negative experience is a factor of mathematics anxiety that can influence students' academic achievement [20]. One respondent stated that most lecturers often give simple examples. However, the questions during the test tend to be a little bit harder and more complicated to be understood and solved. Most students having fear of mathematics with numbers and calculations due to their negative experiences [21]. Similarly, it was found that the instructional methods also influence students' ability in learning such as teaching styles at fast pace, then they may not catch up and having difficulty to understand [22].

"I guess the one of factor which the teacher or lecturer often give examples that easier to do in the class but when they give homework or test, the questions tend a little bit hard. That why sometimes fear anxiety will ... [00:24 unclear] minds in solving mathematical problems"

(Respondent 1)

5.2 Misconception

There were two respondents having difficulties to understand the concept and misinformation with the same pattern of complex questions. Most mathematics education students are having negative anxiety towards learning mathematics such as feels scared, anxious and nervous. Misconception known as misunderstanding and misinterpretation based on understanding the concepts especially in learning mathematics [23]. Thus, lack of effectiveness in teaching skills can lead students to misinformation and misunderstanding the concepts of mathematics. The students would feel powerless and put their border or limit in learning mathematics. The respondent also described that fear of mathematics is more to feel scare and nervous that tends to misconception and confusion in order to apply formula in solving mathematics. Another respondent also had mathematics anxiety especially when fails to understand the concept from beginning and had bad experiences with the same pattern of complex questions. This statement proved that the students who are having complications to understanding the concepts, contents and formula can lead them to experience negative anxiety [24].

"I think that mathematics anxiety can influence students in mathematics achievement where students do not understand the concept of topic mathematics itself. But it is more to feel scares and lack of confidence that tends to not understand the concepts and what the suitable formulas that we need to apply mathematical problems"

(Respondent 4)

"Because they do not understand the concept from the starting point or maybe like I said before, they have bad experience with the same pattern question which is unable to solve the problem for many times"

(Respondent 5)

5.3 Poor Self-esteem

Based on the telephone interview session, six respondents showed that they are having low self-esteem towards learning mathematics when it comes to solve mathematical problems. Thus, mathematics education students keep avoiding to solve mathematics questions and careless in working mathematics solution. It is found that students are able to achieve and dominate in learning mathematics when they became less anxious and more confident in their abilities [25]. The students are able to perform and more confident in learning mathematics when they became less anxious and reduce their nervousness [26]. However, one respondent explained that lack of confidence and feel anxious when it comes to solving mathematical problems. Another respondent described that most mathematics education students having less self-esteem in learning process especially when involved with numbering, formulas and careless in working with mathematical solutions. The respondents also felt lack of confidence when they need to handle and teach students who are advanced in learning mathematics. Previous researchers agreed that the factors of mathematics anxiety can lead students became less motivated, lack of confidence and low self-esteem in learning mathematics [27].

“The only time I have lack of confidence when it comes to mathematics is when I could not solve the mathematical problems”

(Respondent 1)

“Yes. I think everyone have experience lack of confidence in mathematics such as numbering, formulas and careless in working solution mathematics. Based on my experience, that I felt lack of confidence when I did my practicum as training teacher. For example, when we need to teach some of students who is really good in mathematics”

(Respondent 4)

Next, this segment shows the effect of mathematics attitude that influence students in learning mathematics which were the finding from the interview session. The telephone interview results revealed that six respondents felt insecure when it comes to solve mathematical problems. The respondent explained that insecurity which comparing grades or answers makes negative attitude which is overwhelming level of confidence in learning mathematics. The impact is that the students would feel less interest and discouraged towards mathematics. Besides that, another respondent also described that mathematics education students easier to feel despair and give up when it involves hard mathematics questions. It shows that mathematics education students as learners were unable to face failure in mathematics test and highly motivated to avoid failure, not to learn and understand the mathematics concepts. Attitude is related to feelings or emotions when it comes to learn and solve mathematics [28]. For example, if students do not feel confident enough and unmotivated, they may not success and give up to improve their cognitive and abilities. Based on Albert Ellis’ Rational-Emotive Theory known as ABC model of attitudes which A for affective, B for behavioural and C for cognitive explained that the students’ behavioural and emotion could affect each other in learning mathematics [29].

“The effect that influence me in learning mathematics that I always compare myself with other students [00:17 silent] in terms level of thinking especially when we need to find a solution in mathematics. Compare to others, I am not good to find the right solution. Then, I am lack of confidence in solving mathematics especially when we need to solve mathematical problems with time given”

(Respondent 2)

“I think students easier to feel despair or give up when it comes to hard mathematics question. So that, they tend to avoid solve mathematics and feel dislike towards mathematics “I hate math”. It is shows bad attitude which is easily give up without trying to find the solutions”

(Respondent 2)

6. CONCLUSION AND RECOMMENDATION

As a conclusion, it is important to know in depth about the factors of mathematics anxiety and the effects of mathematics attitude in learning mathematics among mathematics education students themselves before becoming a teacher. The study revealed that mathematics education students faced negative experience, misconception and poor self-esteem. The effect of mathematics attitude that influence students in learning mathematics is feeling insecure in solving mathematical problems. In teaching and learning process, it is important for teachers or lecturers to identify the factors of mathematics anxiety that influence students to achieve good grades in mathematics. Teachers or lecturers can build and educate students in improving their abilities such as communication, social, creativity and critical thinking skill. Besides that, teachers can consider to use several learning methods or approaches.

Not only taking students as respondents, a further qualitative approach such as interview with teachers or lecturers, and parents may lead to a better understanding of the factors and effects of mathematics anxiety and attitude towards mathematics.

Lastly, hopefully this research could give some information and awareness on mathematics anxiety and attitude towards mathematics.

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I-CReST 2022:217-193 - Wear Particle Mode and Severity Level of Perodua 1300cc Automatic Transmission (AT) Mechanism at Different Operating Conditions via Surface Metrology Analysis

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ABSTRACT

This paper investigates the severity and mode of wear particles occurring in the Perodua MyVi 1300cc automatic transmission (AT) mechanism via ALICONA Infinite-Focus optical 3D surface metrology analysis. The analysis was conducted merely on automatic transmission fluid (ATF) Perodua original equipment manufacturer (OEM) (ATF-3) series. The ATF samples analysed were categorized into two main operating conditions, encompassing actual distance travelled and continuous chassis dynamometer testing. The operating mileage for actual distance travelled were divided into three main sample classes. The sample number (S1-S6) is categorized as travelling distance (TD1) between 800 km up to less than 20,000 km actual distance travelled. Sample numbers (S7-S17) and (S18-S26) were each representing the operating travelling distance (TD2) and (TD3) encompassed 20,000 km up to less than 40,000 km and 40,000 km up to less than 60,000 km, respectively. The operating mileage for the chassis dynamometer testing meanwhile, was observed at the beginning of 0 km, 1,500 km, 3,000 km, 4,500 km, 7,000 km, and 10,000 km travelling distance which was categorized into sample DY1 – DY6. The outcome of important surface roughness parameters regarded as Ra, Rq, Rsk, Rp, Rv, Rt and wear particle size (elongation) for both operating conditions were determined and justified accordingly. It was observed that the occurrence of wear particles throughout both operating conditions was non-severe and normal wear mode category. This further concludes that a sufficient lubrication layer existed between the surfaces of engaged mechanical components within the AT system despite the ATF having been used more than its recommended period without compromising its quality of performance in the aspect of effective viscosity and additives content.

Keywords: Wear particle; surface roughness; automatic transmission fluid (ATF)

1. BACKGROUND OF STUDY

In addition to being heavily dependent on crude oil, the automobile industry is currently experiencing difficulties due to environmental concerns, rapid technical advancement, and governmental standards and restrictions [1]. In terms of dependence on crude oil, Malaysia has been identified as one of Asia's top vehicle users. As a result, it is hard to stop the automotive industry's increasing reliance on crude oil throughout this period, and vehicles are required for this rise in demand and needs [2]. Due to these concerns, a study is essential to be conducted

to preserve the crude oil supplies and resolve the growing environmental challenge brought on by automobiles. Hence, the main goal of this paper has been to extend the use of automatic transmission fluid (ATF) within the automatic transmission (AT) mechanism. Prior to that, it is crucial to investigate important properties of the extended ATF in the aspect of its relationship between rheological qualities and progression of wear within the specific AT system studied which a Perodua MyVi 1300cc (chassis number: 227021) vehicle model.

The condition monitoring of the torque converter, transmitting gear unit, multiple-disc clutches, and hydraulic control unit are among the crucial parts to be diagnosed when dealing with AT mechanisms because all these parts are highly subjected to tribological stress that could result in catastrophic failure due to the development of an internal severe wear mode [3, 4]. Due to this concern, wear has been the focus of research since it may imperceptibly impair functioning components of the AT mechanism, and most crucially, because losses from wear would become costly if they continued without any preventative measures being implemented [5, 6]. Apparently, this paper addresses the concern on wear particle mode and severity level via analyzing the ATF at two main operating conditions namely, actual travelling distance and continuous chassis dynamometer testing. Perodua ATF-3 series is merely the specific transmission fluid analysed throughout. Principally, automatic transmission fluid (ATF) is applied to lubricate a vehicle's transmission, which can be composed of synthetic or mineral oil that contains valuable additives to sustain the desired friction properties, minimize wear occurrence and provide sufficient corrosion inhibition to the transmission components [1, 5]. It is essential to be understood that utilization of lubricating oil, which in this case the ATF-3 will lead towards significant changes of its additive properties due to ageing. This scenario eventually results in base oil deterioration and protective additive depletion, which lowers the oil's reserve for neutralisation and considerably increases the progression of severe wear within a given operating system [7, 8]. In correlation, this suggests that the occurrence of wear and degradation of lubricating oil are interrelated.

The inquiry based on wear particle size, shape, and surface texture examination is therefore proportionally related and unquestionably important to achieve the diagnosis of the wear mode and severity level from each ATF-3 sample categorised to different operating conditions. In specific, this paper investigates the wear particle roughness parameters encompassing the quantitative values in term of R_a , R_q , R_{sk} , R_p , R_v , R_t and elongation. Roughness parameters which are classified as; R_a , R_q and R_{sk} have been widely used to determine the roughness of wear particle surfaces. Nonetheless, statistical variables of R_a , R_q and R_{sk} and other form of roughness statistical parameters consisting of R_p , R_v and R_t too are normally applied to describe the surface morphology and roughness analysis. In general, R_a is described as a numerical parameter to define the surface roughness of the particles. R_a , R_q and R_{sk} meanwhile are used to measure and identify the evolutions of the surface alterations during running-in to steady state wear stage [9-11].

2. METHODOLOGY

2.1 Surface Roughness Analysis

ALICONA Infinite-Focus optical 3D surface metrology was the apparatus deployed to examine the surface roughness of wear particles for both operating conditions. The apparatus is built in with an optical 3D measurement device designed for quality assurance in both micro and nano range analysis. It provides all functionalities for dimensional measurements, surface analysis

and characterization ideal to be used for both homogenous and compound materials. Principally, the technique is based on focus-variation which the operating principle combines the small depth of focus of an optical system with vertical scanning manner.

The analysis performed complies with ISO 25178 standard of practice for classifying surface texture. This analysis is vital to determine the size of the wear particles and severity level based on the required roughness parameters observed. Decrement and increment in roughness values are paramount in identifying progression of wear stage within the AT mechanism studied.

Shown in Figure 1 is the ALICONA Infinite-Focus optical 3D surface metrology apparatus used to determine the size of the wear particles and severity level based on the required roughness parameters. The selection of resolutions was selected at desired different magnification value in between 2.5X, 5.0X, 10X, 20X, 50X and 100X magnifications, respectively.



Figure 1: ALICONA Infinite-Focus optical 3D surface metrology apparatus

3. RESULT & DISCUSSION

The results of the wear particle roughness parameters encompassing R_a , R_q , R_{sk} , R_p , R_v , R_t , and wear particles size (elongation) analysed during continuous dynamometer chassis testing are depicted in Figure 2. Figure 3 meanwhile show the results for the actual travelled distance operating condition. It was found that the values of R_a , R_q , R_{sk} , R_p , R_v , and R_t exhibited a linearly decreasing trend against the operating mileage throughout the dynamometer test. This suggests that the surface roughness of each wear particle analysed is considered smooth and did not experience any severe material losses throughout. This agrees with Ebersbach et al. [12] which concluded that, if the roughness of wear particles showed an increasing value, it could be expected that the progress of wear would be categorised as near the wear-out stage.

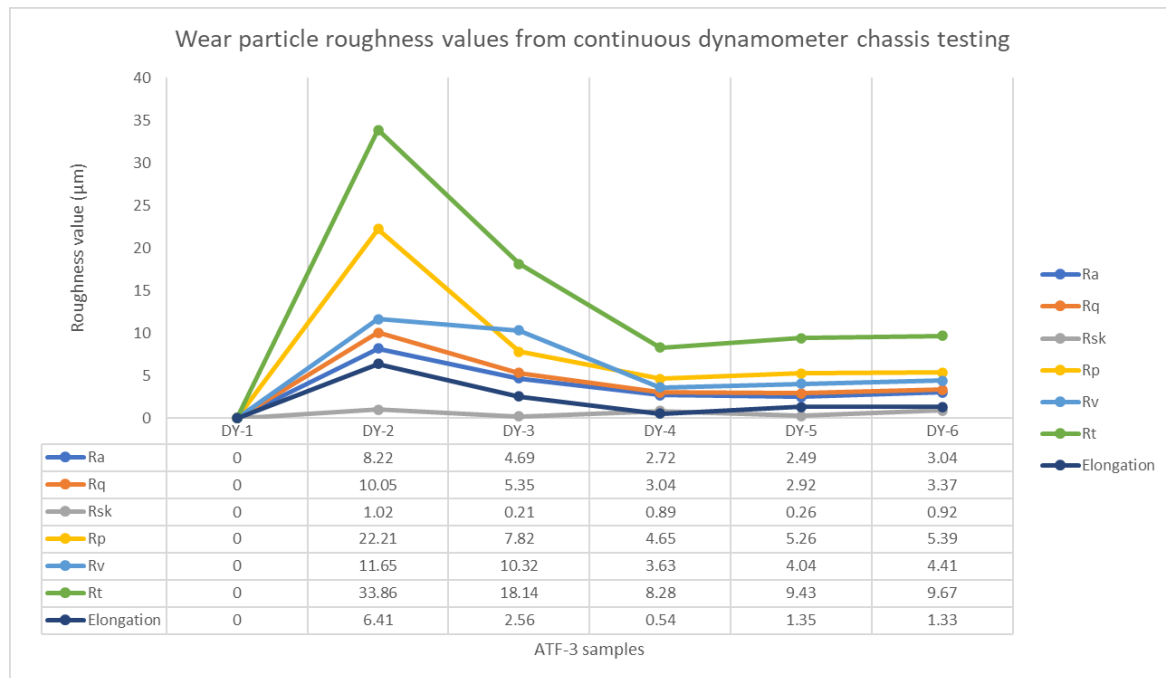


Figure 2: Wear particle roughness values from continuous dynamometer chassis testing

For the operational condition of actual travel distance, a similar result was seen. It was discovered that for all three ATF-3 sampling groups, the average values of Ra, Rq, Rsk, Rp, Rv, and Rt acquired a linearly decreasing tendency against the operational mileage. It can be deduced that this sort of wear particle is benign and modest in size range despite the elongation value in Figure 3 is slightly increasing. Additionally, since no irregular shape was found in any of the samples examined, the occurrence of severe wear mode seems unlikely. This is supported by studies by Iwai et al. [6] and Macia 'n et al. [13], which confirmed that the presence of large particles (above 20 μm in size) was highly important as a crucial early indicator to signify the progress of additives depletion and oxidative degradation, which ultimately leads to severe wear conditions within a mechanism.

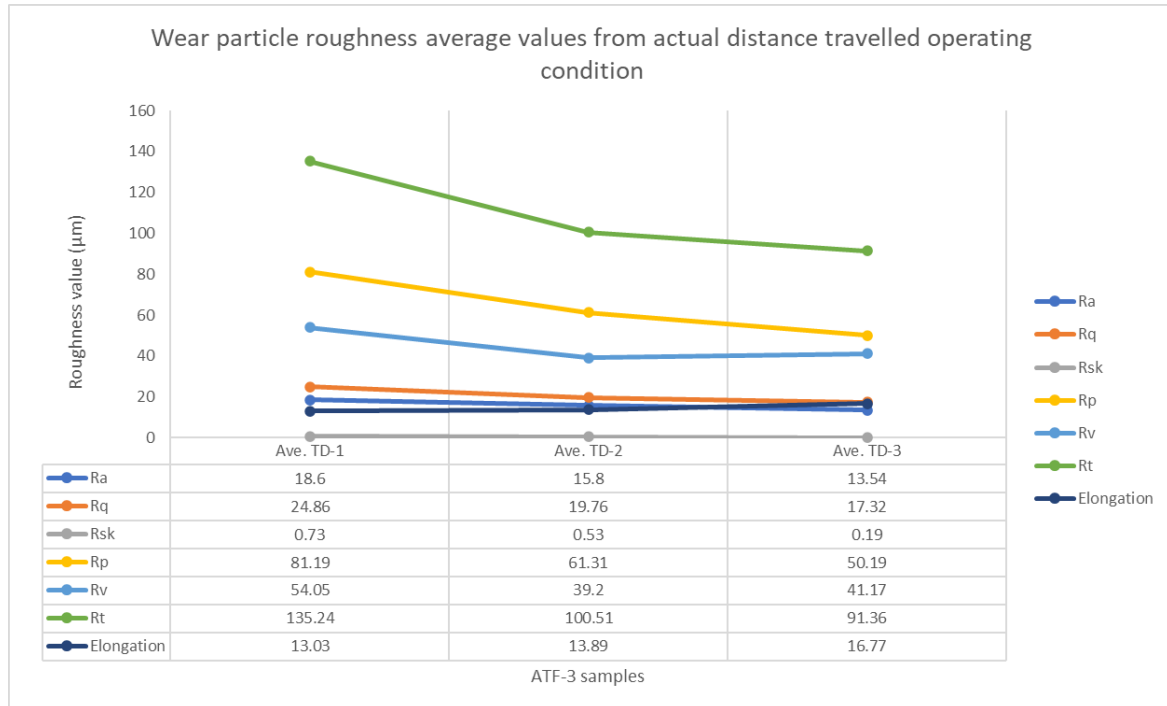


Figure 3: Wear particle roughness average values from actual distance travelled operating condition

Despite being used at continuous high speed (rpm) and past its recommended period of change, the ATF-3 viscosity and anti-wear additive quality were highly effective and undamaged within the AT system, as evidenced by the absence of severe and any abnormal wear mode observed for both operating conditions. This is consistent with the arguments put forth by Williams [14], Peng et al. [15], and Cho and Tichy [16], who claimed that the presence of an atypical wear mode can be detected by additive breakdown and a significant build-up of carboxylic acid concentration in a mechanically operated system through empirical work towards the wear debris samples and oil/lube property analysis.

4. CONCLUSION

It can be concluded that the occurrence of wear particles was minimal in both operating conditions and should be regarded as normal wear mode. Most importantly, this implies that an adequate lubrication layer existed between the surfaces of engaged components within the AT system despite the ATF being used for longer than its recommended period of usage without compromising its performance in terms of effective viscosity and additive content.

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SOCIAL SCIENCES AND HUMANITIES

I-CReST 2022:016-004 - Assessment of Student Engagement in Open and Distance Learning Environment in Construction Management Studies

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ABSTRACT

The proliferation of online learning in higher education has started to change the traditional classroom method of teaching and learning in recent years. The concept of Open Distance Learning (ODL) enables students to access teaching materials online and attend class through multiple technological platforms. Through ODL environment, emerging research attempts to investigate the student engagement in relation to online learning in higher education. However, limited studies have explored student engagement in the ODL mode environment. This study assesses student engagement in ODL mode of study in construction management programme. The Online Student Engagement (OSE) instrument has been adapted and distributed to construction management students via online survey. A total 121 undergraduate construction management students completed the online survey. The results indicate that skills and emotional components are the most important in engagement of students in the ODL environment.

Keywords: Online learning; ODL; student engagement; online student engagement

1. INTRODUCTION

The era of global pandemic crisis has greatly impacted the higher education sector (Aguilera-Hermida, 2020; Chan et al., 2021; Pasion et al., 2020; Hussin Awang and Mohd Fatzel, 2020; Qazi et al., 2021). Physical contact in classes and at universities has been limited in the number of students and staff due to social distancing. Due to safety and health reasons, all students are required to continue their study remotely from home through online learning platforms. The conventional method of teaching and learning has gradually shifted online and has been embedded in every course. Most universities are prompted to take a considerable action in preparing the strategies for students and teachers to conduct lessons online. Typically, the mode of online learning can be conducted synchronously and asynchronously depending on both the teachers' and students' preference. Open Distance Learning (ODL) is an online learning activity that merges open and distance learning for any one who needs education without any sort of prerequisite requirement or age. It also may come with a fee or entirely free (Simpson, 2018). In addition, ODL emphasises on open access and flexible learning that transcends all boundaries to allow all learners to have opportunities to education (UNESCO, 2002). Therefore, students/learners across all geographical locations can reap the benefits and personalise their learning activities at anytime and anywhere that fit their schedule.

Although ODL may seem interesting, it may not be suitable for all students as it requires a great amount of dedication and focus to the lesson taken. Bower (2019) argues if students have trouble with technology they are using or lose in social connection and mental engagement, then the students' learning outcomes can be negatively affected. Without proper instructions and guidelines, teachers and students can easily fall into a pretentious discussion and critical learning experience during online lesson (Choy and Queck, 2016). This is because most students are used to attend face-to-face classroom and able to engage with the teachers. Students are able to exchange ideas and communicate among themselves and the teachers regarding their lesson (Robinson, 2012). In contrast, online learning environment may have challenges for some students to participate or engage in their online lesson due to capacity of internet connectivity and the distance that gradually demotivate them (Cho and Cho, 2014; Hussin Awang and Mohd Fatzel, 2020). Even if students can learn online lesson at their own pace, whether it is synchronously and/or asynchronously, the level of student engagement in ODL environment remains uncertain. Therefore, student engagement in ODL environment plays a significant role in determining the academic performance and learning outcome.

2. LITERATURE REVIEW

2.1 Open and Distance Learning (ODL)

The concept of ODL has been introduced in past decades and started to gain attention in the literature in recent years (Saidi et al., 2021; Bordoloi, 2018; Ghosh et al., 2012; Dzakaria, et al., 2005; Davis, 1996; Hogson, 1993). The term ODL also known as "Self-learning", "Independent learning", "Flexible learning" connotes that learners are able to access self-learning and personalise their learning activities according to their own pace using advanced technology platforms and tools (Bordoloi, 2014; Yang et al., 2014). Common online tools including Zoom, Webex, Google Meet, Microsoft Team and Whatapps enable communication, collaboration and exchange of information between students and teachers (Saidi et al., 2021; Hussin Awang and Mohd Fatzel, 2020). Students are able to remotely access the lesson materials online via mobile devices to communicate with their teachers and peers either verbally and/or texting at anytime (Hussin Awang and Mohd Fatzel, 2020). On the other hand, teachers can provide pre-recorded videos or conduct a live session depending on their availability and situation. Based on a survey results, students prefer synchronous online lesson compared to asynchronous, while both students and educators prefer social media-Whatapps and live video conference technology-Google Meet (Saidi et al, 2021). Luaran, Jain and Abd Rahman's (2016) study shows positive inclination towards Whatapps as a platform of sharing academic materials file. It is reported that students tend to actively involve and show confidence through instant discussion via texting or voice message.

The flexibility of learning among students in ODL mode has made it easier to access, but on the flipside, the students' engagement and persistence to cope with academic activities has gradually deteriorated. Students are still tied to physical lesson as they need the presence of teachers and other students to learn. A study found that most undergraduate law students prefer blended learning (i.e classroom learning and online learning) over fully fledged online lessons (Selvaras, 2019). In addition, one-third of accounting students are reported to dislike ODL lessons due to mainly poor internet connectivity (Hussin Awang and Mohd Fatzel, 2020). Student are facing these challenges during the ODL lessons where some of them may have problem to access to internet connection at home and/or at their location. Consequently, it will affect their overall academic performance (Zuhairi, et al., 2019; Dzakaria et al., 2005)

2.2 Student Engagement

Online learning and student engagement in the literature has been getting more attention in the higher education sector especially in the plight of COVID-19 pandemic (Pasion et al., 2020; Aguilera-Hermida, 2020; Bolliger and Martin, 2020; Henrie et al., 2015; Shukor et al., 2014). The term student engagement is associated with student experience in activities that resulted from a meaningful discourse between student's motivation and active learning (Barkley, 2010). Kuh (2009) defined student engagement as the amount of energy and time students spend in activities to achieve the university's objectives and outcome, and student's motivation to take part in the activities. Students have the freedom to take control of their academic activities through online learning and responsibilities to complete their courses. Self-discipline, dedication, and good time management skills are important to adapt with the flow of the courses (Chan et al., 2021). Few studies indicate the positive effect of online learning and student engagement with satisfaction of online education and learning outcomes that include examination results, critical thinking and practical application (Gray and DiLoreto, 2016; Hampton and Pearce, 2016). Moreover, students can reap the opportunities in flexible learning while fulfilling other responsibilities in education attainment (Tanis et al., 2020; Stone et al., 2016).

The unprecedented switch to online learning due to unfortunate event have impacted their ability to engage and focused to online lessons (Aguilera-Hermida, 2020; Hodges et al., 2020; Murphy et al., 2020). Many students complaint they are distressed and have tendency to form a negative view towards ODL experience and worsen by the lack of supporting resources (Aguilera-Hermida, 2020). The sheer lack of experience and decrease in dedication among students leads to rising anxiety and passive learning (Pasion et al., 2020). Past research reported that students experience low level of engagement, feeling of isolation, and lack of participation and presence in ODL (Lane et al., 2015).

As a result, the implementation ODL has haphazardly affect on student engagement in keeping up with the online lesson. Therefore, this study aims to assess student engagement in ODL environment in construction management on undergraduates students from Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia.

2.3 Construction Management Programme

The construction management programme provides wide spectrum of curriculum that expose students with the construction processes, analysis, theoretical knowledge and application of methods in construction development (AP246, 2021). The outcome of programme equipped students with fundamental skills that are not limited to problem-solving skills, technical skills, IT skills, communication and leadership skills. These skills enable students to adapt to the ever changing complex nature of construction methods and procedure that require teamwork and interdisciplinary collaboration experience (Jin et al., 2018). The instructional approach to teaching and learning in construction management can no longer remains in the contemporary times. ODL introduces opportunity to explore new learning mode that accessible in various learning platforms include; Massive Open Online Courses (MOOC), Moodle, Google Classroom and others alike.

The acceleration of digital transformation in higher education, ODL is the beacon of delivering future education. The construction management programme is not an exception in

this transformation especially the field has evolve inevitably towards digital construction such as Building Information Modelling (BIM), Virtual Reality (VR), Internet of Things (IoT) and Artificial Intelligent (AI). For example, VR assisted environment could improve learning outcome and enhance student's achievement, motivation, and engagement (Elgewely et al., 2021). BIM-visualised models and related databases are able to enhanced digital platform for education especially in online learning (Clevenger et al., 2012). Similarly, IoT and AI has exponentially influence construction management programme further to adapt the workplace demand of multiple digital skills and communication skill (Pan and Zhang, 2021; Fang, 2020). This is important to equipped student when they graduate with the fundamental skills include competency in construction technologies in drafting, virtualisation, visualisation and autonomous processes in a digital construction environment (Olantunji, 2019)

Although the prospect of ODL in construction management is promising, several challenges in the curriculum requires not only technology-driven education but other aspect in hand-on activities such as laboratory tests, handling survey equipment and also outreaching to community. In doing so, to assess student engagement in ODL require balance of learning experience for both theoretical and practical application in construction management programme. This will prepare them with knowledge and skills to enter into the workforce and develop their professional career.

2.4 The Online Student Engagement (OSE)

In assessing student engagement online, Dixon (2015) developed the Online Student Engagement (OSE) instrument to measure student engagement in online environment. The OSE approach was underpinned by the combination of Community of Inquiry (CoI) model, social constructivism, and redefinition of student engagement in the physical classroom to online learning environment (Dixon, 2015). The redefinition posits that engagement in online learning involves student participating in learning skills and able to comprehend teaching materials, connect and emotionally engage with their classmates in a meaningful discourse throughout the learning process (Dixon, 2015). OSE approach is suitable to measure the extent to which student feel about their learning, involvement in online lesson, and fruitful interaction with the learning contents with both teachers and other students. As shown in Figure 1, the aspect of skills, performance, participation and emotional are the components that represent the online engagement.

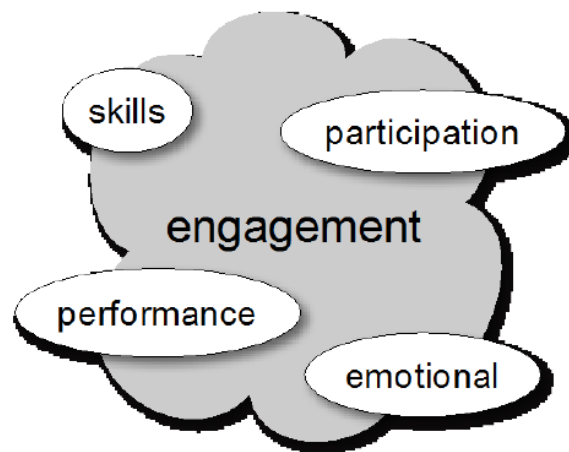


Figure 1: Affective and Behavioural Components of Engagement (Source: Dixon, 2015)

The main functions of OSE are: (1) To provide assessment for teachers about the level of student engagement towards the selection of course design being made, (2) To help design for online course research, (3) To validate the effectiveness of teaching, teaching award, argument of merits, tenure/promotion position. In contrast, other instruments such as the National Survey of Student Engagement (NSSE), Student Engagement Instrument (SEI), the Engagement versus Disaffection (EvsD), and Motivation Strategies for Learning Questionnaire (MSLQ) also measure the student engagement but somehow limited in the course of online learning environment especially in ODL (Lee et al, 2019). Therefore, the scales of OSE was adapted and relevant to measure the extend to which students engage in ODL environment.

3. METHODOLOGY

3.1 Participants

Students pursuing Construction Management Studies, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA from first to final year were selected as participants in this study. They were invited to complete the online questionnaire with a Google Form link distributed via the social media platform (i.e Whatapps) and Google Meet chatbox at the end of the online lessons. Overall, a total of 121 students voluntarily took part in this study with 100 percent usable data.

3.2 Instrumentation

The OSE instrument (Dixon, 2015) was adapted for this study. The OSE measures 19 items related to the components of affective and behaviour engagement that include statements about skills, participation, performance, and emotional. The online questionnaire items used a five-point Likert scale which ranges from 1= “Strongly Disagree” to 5= “Strongly Agree”

3.3 Limitation

The data collection for this study faced several limitations. The self-administered online questionnaire could result in distribution errors. The participants were informed during the online lesson to reduce the error. On the other hand, the sample of study is rather small and limited to only construction management students, hence the findings are discipline-specific and do not represent a wider population.

4. FINDINGS

4.1 Descriptive Statistic and Analysis

The data collected from this of study was analysed in descriptive statistics. The online questionnaire consisted of 23 questions was divided into two parts–demographic information and the OSE measures items. The demographic information is shown in Table 1 below.

Table 2: Demographic characteristic of respondents (N=121)

Demongrapic Characteristic	Items	Number of respondents	Percentage (%)
Age	18-24	119	97.5%
	25-30	2	1.6%
	31-40	-	-
	>41	-	-
Gender	Male	44	36.1
	Female	77	63.1
Semester	Sem 1	44	36.1
	Sem 2	18	14.8
	Sem 3	7	5.7
	Sem 4	-	-
	Sem 5	-	-
	Sem 6	49	40.2
	Sem 7	3	2.5
Mode	Full-Time	120	98.4
	Extended Full-Time	1	0.8

Most of respondents were age 18-24 (97.5%) and majority of them are females (63.1%). The students are mainly seen from Semester 6 (40.2%), which they are in the final year of university. Almost all students are in full-time mode (98.4%) of construction management programme. Meanwhile, Table 2 shows the mean for OSE measures for construction management students. The OSE questionnaire items were categorise into four main components that include skills, participation, performance and emotional. From the results, each of the component demonstrate a good Cronbach alpha values where all items are reliable. The study found out that the lowest mean was the performance category (M=3.67), while the highest means were both the skills and emotional category (M=3.71). It also shows that overall mean of OSE measures show a positive results (M=3.69) that students tend to agree that online learning environment able to help them developing their skills, participate in online lessons, perform in their academic activities and emotionally engage with other students and teachers in online lessons.

Table 3: Mean of OSE measures

Category	Items	Alpha Value	Mean	SD
Skills	4	0.82	3.71	0.69
Participation	5	0.86	3.68	0.67
Performance	5	0.85	3.67	0.65
Emotional	5	0.85	3.71	0.69
Overall Mean	-	-	3.69	-

5. DISCUSSION

The plight of post-pandemic, the ODL environment has exponentially becoming the norm for students and teachers in the higher education sector. Both students and teachers need to recalibrate their learning techniques in the online environment. Either synchronous and asynchronous mode of lessons, the continuum of teaching and learning needs to grasp the student engagement in the university. The undergraduate students in construction management programme offered in UiTM, Shah Alam provide a wide-ranging curriculum that emphasise on process, analysis and comprehensive understanding of theories and practical methods applied in construction and development.

To assess the student engagement in ODL environment, an online questionnaire survey adapted from the OSE measures has been designed and distributed. The findings highlight that the component of skills and emotional score the highest mean in the student engagement in ODL environment. On the other hand, the performance component of OSE measures score the lowest mean in terms of student engagement in ODL environment. This indicate that skills and emotional components are the utmost important in engaging student online to enable them to acquired the skills before they graduate in addition to support student emotional wellbeing while they are attending the online lesson. Open communication, group interrelation and emotional display are the foundation to feel connected and belong (Choy and Queck, 2016; Garrison et al., 2010). Also, the attainment of skills are crucial to develop student competency to secure a better future career opportunities after their graduation (Teoh et al., 2013).

Although, the performance component is just as important in student engagement online but it seems that continuous hours of online learning may reduce their overall performance in online class gradually. Several studies reported that the retention and dropout rates in full-scale online programmes have been a source of worry, ranging from 10% to 50% (Allen and Seaman, 2014; Choi and Park, 2018). The student academic performance may jeopardise if there is less support from the faculty, feedback from the teachers or practical course design that encourage involvement and commitment of students in throughout the years of their study (Teoh et al., 2013). Therefore, to instil students interest in online lessons, a well-rounded support from the faculty level, department and teachers need to convince students that they could experience a better online learning experience. In sum, the overall mean of OSE measures indicate a moderately strong results in students engagement in online lessons.

6. CONCLUSION

In higher education, traditional teaching and learning methods are not the only option. The introduction of technology, combined with the serious global health COVID-19 pandemics, has ushered in a new era of teaching and learning in higher education. In the face of rising obstacles in teaching and learning, students and instructors alike are being compelled to cope with the use of ODL. The level of student involvement with the educational materials in the ODL has yet to be determined. The university's online learning platform is used to conduct ODL sessions for the construction management programme at UiTM Shah Alam (i.e. Ufuture). A total of 121 undergraduate construction management students took part in the online questionnaire survey. The online questionnaire survey was designed by adapting the Online Survey Engagement (OSE) measures that primarily consist of skills, participation, performance, and emotional components. The results show that skills and emotional components score the highest mean, while performance component score the lowest mean in student engagement in ODL environment. Skills and emotional components equipped student with the valuable skills that is important for future employability as well as the need of emotional connection in open communication with teachers, classmates and faculty in the period of their studies. On the other hand, performance component in the OSE measures imply the deteriorate of students academic performance as continuous online lesson that causes passive learning without a meaningful discourse of their lesson. The overall mean of OSE measures score a moderately strong results in student engagement in ODL environment. Future study could explore further by using survey method to inter-department programme at faculty level and inter-university level to capture the effectiveness of student engagement in ODL environment in a larger scale.

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I-CReST 2022:050-017 - Prisoners' Rights to Vote: A Review of Literature

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ABSTRACT

Democracy is a well-known form of government practiced in many countries worldwide. One of the fundamental criteria of democracy is how it promotes basic human rights like equality, which can be proven by the people's ability to vote during the general election. However, some issues arise in the case of disenfranchisement, where prisoners are restricted from voting. These prisoners' rights to vote as fundamental liberty are automatically waived when committing the offense. Due to that, this paper aims to discuss the relevant reasons why prisoners should be allowed to vote. The review has indicated several significant reasons why convicted people or prisoners should be allowed to participate in that event. One of those reasons is that prisoners are given unfair treatment in selecting voters. The authorities do not consider their voice and opinion on this topic and are merely believed to be uninterested. Besides that, barring them from voting violates fundamental human rights. In reality, numerous international laws protect this right but are ignored in some parts by the countries. Lastly, prisoners should be allowed to vote as it enforces democratic values. Restricting prisoners to vote is not aligned with the imprisonment sentence's aim. Thus, this paper will present information to convince government entities to recognize that voting is an intrinsic human right and that everyone, including prisoners, should not be denied it.

Keywords: Disenfranchisement; human rights; law; prisoner; vote

1. INTRODUCTION

Modern human rights rose in popularity following the end of the second world war. Since then, numerous conventions, treaties, and international organizations have been established to accommodate this critical issue. One of those so-called human rights is the right and liberty to vote in an election. The election is a thorough and confidential operation that would allow citizens of their respective countries to choose who they think is a capable leader and representative that will dictate the nation's direction. Therefore, it is a vital political chip that certain parties, more often than not, regarded as the wrongdoers who have committed offenses against the state shouldn't be allowed to participate. In actuality, a prisoner or any convicted individual should be allowed to vote as prisoners are given unfair treatment in the selection of voters. It is also a violation of fundamental human rights and enforcement of democratic values. Democracy is a well-known form of government practiced in many countries worldwide. One of the fundamental criteria of democracy is how it promotes basic human rights like equality, which can be proven by the people's ability to vote during the general election. However, some

issues arise in the case of disenfranchisement, where prisoners are restricted from voting. These prisoners' rights to vote as fundamental liberty are automatically waived when committing the offense. Due to that, this paper aims to discuss the relevant reasons why prisoners should be allowed to vote.

2. PRISONERS' VOTING RIGHTS

2.1 Unfair Treatment and Opportunity

First and foremost, prisoners should be allowed to vote as they are given an unfair opportunity to select voters. This is partly because the voting eligibility relied on the mercy of the judge at hand. For example, David Feldman, a Cambridge University professor, expressed that voting rights could be manipulated with the term social contract where citizens could get the right to vote by following the given rules set by society and are restricted from having it by committing a specific crime [1]. Some differences could be seen in countries like the United States, where people who have committed wrongdoing are disenfranchised depending on the sentence they receive rather than the type of crime they commit [1]. This proves that a gap in the justice system could be seen as unequal for everyone.

Moreover, there is also a misconception of prisoners' interest in the election. Undeniably, a strong narrative and perception see prisoners as problematic people. Because of that, they were regarded as unable to make a rational decision or simply uninterested in the whole concept of citizens' duty. However, those groundless assumptions should not be taken seriously as there is profound evidence that proves the exact opposite recently. According to Vermont and Maine [2], two states in the United States permit people with felony convictions to vote, including those who are jailed. Furthermore, other states have begun efforts to push for full enfranchisement, similar to what an ex-prisoner like Washington has done [2]. Therefore, it's clear that voting is vital to these prisoners because there is bias in voting picks as it depends on the authority powers and society's stereotypes of convicted individuals.

2.2 Violation of Basic Human Rights

Besides, prisoners should be allowed to vote, as denying it will violate fundamental human rights. Part and parcel of that are because the basis of human rights is protected by international law and a country's constitution. Article 25(b) of the International Covenant on Civil and Political Rights (ICCPR) highlights the principle of voting rights, whereby citizens shall have the chance and right to vote without any irrational limitation (as mentioned in Article 2) with the condition that it is a secret ballot [3]. The words "irrational limitation" are highly argued in that article. While some political leaders agree that the person who has committed a crime falls into the category of that irrational limitation, there is the opposition that thinks it is not quite enough for it to be considered irrational. On that note, one needs to know that international law only serves as a guideline for most countries to follow.

Countries that are non-signatory to the convention have no obligation to act accordingly to the article. That is why this issue needs to be further discussed domestically. It is stipulated by [4] that the qualification of a person to cast a vote is invalid in the House of Representatives or Legislative Assembly if the person has an unsound mind or serving a sentenced of imprisonment on the qualifying date, or has been convicted of any offense prior the qualifying

date. This shows that our nation's law is inclined more toward the doctrine that a crime is a good enough reason for it not to be considered irrational.

However, it is still argued that the restrictions on the fundamental right imposed in the constitution are unnecessary. Ireland is a good model as their prisoners are all given the right to vote without public demand, media attention, or court ruling; therefore, making this country adhere to the human rights obligation (as stated in international best practices for the civil right) [5]. A similar example can be seen in the petition to allow prisoners to vote; the Supreme Court of India banned that in 1997 due to the limited resources in prison, such as police security [5]. All in all, the convicted person must have a voice in voting as their inherent human right are safeguarded by the international and domestic entities, which should not be restricted with needless sections and clauses.

2.3 Enforcement of Democratic Values

Last but not least, prisoners should be allowed to vote as it is a form of enforcement of democratic values. In this case, patriotism is one of those targeted core elements. Every government wants its people to devote their time and energy toward the betterment of their country. This includes the prisoners. The reason for that is because one of the purposes of prison, aside from deterrence and retribution, is rehabilitation. As stated in Article 4 of [6], the objective of the sentence of imprisonment can only be met if the time spent in prison is used as much as possible to ensure prisoners live a law-abiding and independent life when released later. To clarify that, Scottish Lib Dem justice spokesperson Liam McArthur states that rather than segregating prisoners, raising awareness to the public about their responsibilities as citizens to reduce recurring similar [7].

Therefore, isn't giving these prisoners the right to vote a clear and rational action? Although justice needs to be served to maintain the harmony of public order, the government needs to see this matter as a long-term investment. Educating these people instead of punishing them can open their minds about changing their decisions and lifestyle that will be contributed back to the country. There will be a positive impact, such as declining rates of offenses and the addition to the workforce that is great for the economy. Moreover, denying prisoners the right to vote is a form of additional punishment. If imprisonment is already a harsh punishment, then why do they also need to be stripped of their right? This can be proven when the United Nations declared in 2001 that denying prisoners the right to vote was an additional punishment [7]. Article 20(2) of [8] stated that implementation and sanctions against a person could not be imposed twice for the same offense. Therefore, enforcing democratic values can be increased by giving prisoners the right to vote because the prison's objective is not just punishment but also recovery.

3. CONCLUSION

In conclusion, it is clear that the right of prisoners to vote is compulsory as prisoners are given unfair treatment in the selection of voters, it's a violation of fundamental human rights, and it's an enforcement of democratic values. We must consider that these people are still rightful citizens, subject to their country. Therefore, it is an excessive punishment for them to be stripped of their right while being sentenced to harsh punishment like imprisonment. If imprisonment is truly a corrective justice system, the government should resort to other initiatives to help these wrongdoers adapt to society and not simply punish them. The best example they can start with is allowing these prisoners to maintain their right to vote even when

the authorities criminally charged them. Enabling them to vote will instill a sense of being a responsible citizens and prevent them from thinking that they are shunned by society. In other words, a ray of hope will help them from being excluded and still have the chance to be redeemed. It's our greatest hope that all countries' leaders reconsider their government policy toward a more lenient direction that will give prisoners a second chance to be better citizens—the most sincere and utmost principles of democracy.

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I-CReST 2022:059-134 - Impact of Online Advertising on Malaysian Millennials Buying Behaviour

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ABSTRACT

Advertising is one of the best ways to communicate with customers in order to introduce a certain brand or products in the market. Advertising helps to inform customers regarding the available products in store, what is new in store and what the products are about. Nowadays, the rise of new media has made marketers change their platform to advertise their products or services. If a few years ago, they targeted their consumers by using traditional media now they are choosing online advertisements. It is because people in this era are more attached towards online channels compared to traditional media. People, especially millennials, tend to purchase unnecessary products after being exposed to certain advertisements. Thus, this present study aims to identify the impacts of various advertising contents such as informativeness, entertainment, credibility, interactivity and privacy concerns on the attitude of Malaysian millennials towards online advertising. In achieving this, a quantitative method was used by distributing the online questionnaire through Google Form to at least 100 millennials. Non-probability sampling used in the present study to obtain respondent number. Findings show there are significant impacts towards buying decisions when millennials are exposed towards advertisements with correlations results $>.50$. Results show that when they watch advertisements, it influences their buying behaviours.

Keywords: Online advertising, Malaysian, millennials, buying behaviour

1. INTRODUCTION

The Internet has grown widely and became a part of people's life. Most people, especially millennials at least have one personal social media account. 69% of Malaysians routinely use the internet to read news, watch videos, and communicate with friends through social media and around 88% of Malaysians own a smartphone (Digital Business Lab, 2021). In January 2021, it stated that the number of internet users in Malaysia increased by 738 thousand (+2.8%) between 2020 and 2021 (Kemp, 2021). Advertising comes from a word of Latin language "advertise" which has the conception of "to turn to", but the dictionary explains the meaning of this term as "to give public notice or to announce publicly" (Rehman, Harun, Mdyusoff, Khan, & Ismail, 2019) Advertising is a part of marketing communication and it is used for communicating business information and spreading awareness about certain products or services. According to the American Association of Marketing (AAM) "advertising is any paid form of non-personal presentation and promotion of ideas, goods and services by an identified sponsor"

Nowadays, in this globalisation era, most marketers choose new media as the medium to promote their business rather than using traditional media due to the fact that online usage is increasing day by day. People are starting to go for digitalisation by using their smartphones to access the internet and they are exposed more towards online advertisements compared to advertisements in traditional media. It is because by choosing online platforms, marketers can reach millions of people in a short time. There are no boundaries and restrictions by using online platforms. Other than that the rise of smartphones gives an impact towards online advertising. Back then people needed a computer to get access to the internet but not now. People nowadays easily access the internet and they can use their smartphones to stay online. Marketers see this as an opportunity and in order to cater the target audience most of the marketers choose online platforms to advertise their products. Millennials are part of the online users. They are engaged with social media and most of the online platforms. Millennials nowadays depend a lot on digital media compared to traditional media. Issues arise when people, especially millennials tend to buy unnecessary items just because they are exposed to online advertisements. The more frequent they spend their time online the easier they get influence.

Moreover, recently, Covid-19 has struck the world. Most of the people need to stay at home as the government implemented Movement Control Order (MCO) which prohibits mobility and gatherings across the country. Malaysians are not allowed to go out unless necessary to procure or supply vital goods and services such as food, daily necessities, and healthcare. The lockdown has resulted in most people taking to the internet and internet-based services to communicate, interact, and continue with their job responsibilities from home. Internet services have seen rises in usage from 40 % to 100 %, compared to pre-lockdown levels. (Rahul De', Neena Pandey, Abhipsa Pal, 2020). Millennials is a fans for online shopping even before the Covid-19 outbreak, but during the pandemic, the number are increasing as government implemented MCO, people got any other choice instead of stay online and some of them might do online shopping just because they frequently watch the online advertisements. Millennials are shifting their shopping preference and moving further towards online platforms (Fischbach, 2020). This new trend is not limited to adults with purchasing power, but also to young adults (millenials who have the ability in buying). Hence, this study aims to examine the impacts of online advertisements on millennials buying behavior. This is also presented in the conceptual framework below (Figure 1).

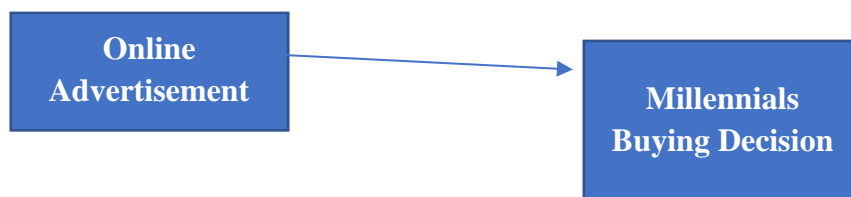
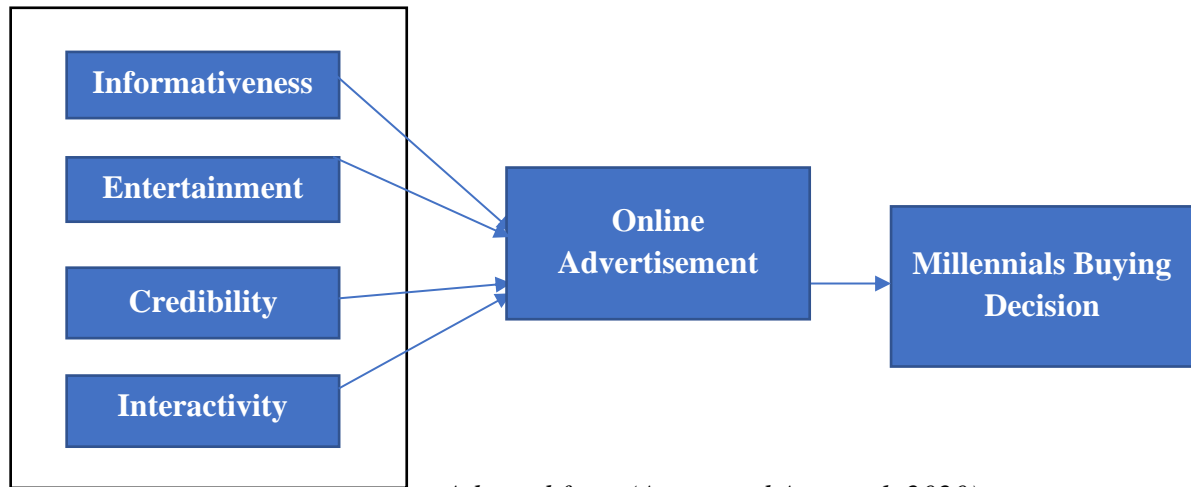


Figure 1: Conceptual Framework on The Online Advertisement and it impacts towards millennials buying decision

Through the research framework illustrated below in Figure 2 it can be learned that online advertisement has four characteristics, which are informativeness, entertainment, credibility and interactivity. The characteristics of online advertisement somehow relate with millennials buying decisions.

1.1 Characteristic of Online Advertisement



Adapted from (Arora and Agarwal, 2020)

Figure 2: Research Framework on Impact Online Advertisement on Millennials Buying Decision

There are five (5) hypotheses developed and need to be further tested. Hypothesis obtained from the research framework (figure 2). List of hypothesis are as follows:-

- H1: Informativeness in online advertising positively influences Malaysian millennials buying decisions.
- H2: Entertainment in online advertisements positively influences Malaysian millennials' buying decision.
- H3: Credibility in online advertisement positively influences Malaysian millennials buying decisions.
- H4: Interactivity in online advertisement positively influences Malaysian millennials buying decisions.
- H5: There is a significant relationship between characteristics of online advertisements and millennials buying decisions.

2. LITERATURE REVIEW

2.1 Online Advertising

Advertising comes in many forms and online advertising is a part of it. Online advertising is a marketing strategy that has been practiced for a few years. It involves the internet as a platform to advertise the product or services. The examples of online advertising are banner ads, search engine results pages, social networking ads, email spam, online classified ads, pop-ups, contextual ads and spyware. Advertising using the internet is a new platform for marketers to create awareness, increase brand loyalty and to identify the customers through their daily feedback.

Online advertising has grown rapidly. The Internet has become a part of everyone's life in today's era. Most people frequently watch online advertisements as the development of the internet increases the number of online shopping activities. The internet audience is greater than the audience in traditional media. It can be said that every house has their own internet

connection and some of the users have a basic internet connection on their smartphones (Allam et. al, 2020). It is understandable why marketers choose online platforms to advertise their products and services. Besides that, online advertising cost is lower than traditional media and this encourages advertisers to promote their product online (C.Rajalakshmi & Purusothaman, 2017). Research has been conducted by Institute for Market Research Malaysia, in the report it stated that online platforms continue to be the most widely used by millennials as an information source, with 69% of millennials respondents selecting the internet or online sources as their major information source.

2.2 Millennials

A generation can be formed by important life events like wars, new technology, or substantial economic transformations. Three generations, which are Millennials, Generation X, and Baby Boomers have dominated the workforce over the past 60 years. Each of the generations represents a different background and age group. They are being grouped by age.

The “millennial” label is applied to a generation that was born roughly between 1981 to 1996, which followed the “birth dearth” period of Generation X (born 1965-1980), which was preceded by the baby boom generation (born 1946-1964). Millennials are close to the new millennium and they grow in the digital age (Frey, 2018) Millennials have a significant impact on local economies, levels of wealth inequality, and the need to foster greater racial and social inclusion. They will have an impact on housing markets, educational systems, tax bases, and labor markets. Therefore, government leaders, business executives, university and community college networks, and nonprofit organisations need to be ready to learn about the changes that this new adult generation will bring. This generation is an asset for the country because they are the one who will lead the country in future.

According to the Department of Statistics Malaysia, Malaysia's population is expected to reach 32.7 million in 2021, up from 32.6 million in 2020, with a 0.2% annual growth rate. In 2020, the percentage population of Malaysians aged from 15 years old to 64 years old is 69.7%, which is 22.7 million. Millennials belong to this group as their age is between 26 years old to 40 years old, which accounted for 50% of the Malaysian working population. (Department of Statistics Malaysia Official Website, 2021) Millennials form a significant proportion of the labor force and economic power. Both millennials and Gen Z are now the largest generational cohorts, with the power to influence consumer and market trends over the next decade.

2.3 Buying Decision

Buying decisions is a part of the decision-making process. Consumers engage in a sequence of decisions before making a purchase once they have demonstrated a willingness to do so. Consumers start looking for information when they become aware of the products or brands they want to buy. At this stage, consumers will begin comparing prices, brands, sizes, locations for purchases, and other factors.

By providing details that may influence the consumer's evaluation process, the marketer tries to sway each of these choices. This buying decision process involves five basic steps. The five steps are problem recognition, information search, alternatives evaluation, purchase decision and post-purchase evaluation.

3. METHODOLOGY

A cross sectional study was adopted to examine the impact of online advertisement towards millennials buying decision. Male and female millennials were focused in this study and the study setting is in Malaysia. Millennials were the population of this study. Respondents who belong to that group were being specified as the study population. The present study used non-probability sampling and the data was collected using an online questionnaire which was distributed to 100 respondents through Google Forms. People around this age were the population of the current study. In this study, millennials around the 26 years old to 40 years old were being specified as the study population. Using the previous literature, measurement scale has been adapted as mentioned in Table 1. These constructs have been measured on a five-point Likert scale ranging from strongly agree (5) to strongly disagree (1). Extensive discussions were held with experts and scholars from the area of marketing and research for refining the questionnaire. Also, a pilot testing was done with 100 respondents with the view of improving the clarity of the survey instrument with the respondents' feedback and suggestions.

Table 1: Research Questionnaires

SECTION A	DEMOGRAPHIC	
A1	Gender	Adopt from Chow, Edmond & Hassan, Zubair. (2019)
A2	Age	
A3	Income	
A4	Education	
A5	Time Spent on the Internet per day	Adapt from Liu, Y. (2003)
SECTION B	INFORMATIVENESS	
B1	I found that online advertisement that I watched contains of many information	Adopt from Antoniadis, Assimakopoulos & Koukoulis, (2019)
B2	I found that after watching online advertisement, I got the information that I need	
B3	I found that advertising is a valuable source of information about sales	Adapt from Ling, K.C., Piew, T.H., & Chai, L.T. (2010)
B4	I found that advertising tells me which brands have the features that I am looking for	
B5	I found that advertising keeps me up to date about product/services available in marketplace	
SECTION C	ENTERTAINMENT	
C1	I found that online advertisements is entertaining	Adapt from Gangadharbatla, Harsha & Daugherty, Terry. (2013)
C2	I enjoyed watching online advertisements on online platforms	
C3	I found that online advertisement is a source of pleasure and entertainment	Adapt from Awan, A.G. (2016)
C4	Advertisement do attract my mind and convince me to make purchase	

C5	The element of humor and fun in certain advertisement can attract me to watch the advertisement for a few times	Adapt from Zernigah & Sohail (2012)
SECTION D	CREDIBILITY	
D1	Online advertising is believable	Adapt and Adopt from Lo, J., Lee, S.C., Loo, P.L., Sellvam, S., & Sandran, T. (2014).
D2	Online advertising is reliable	
D3	Online advertising is trustworthy	
D4	I personally think that because of online advertisement, people tend to buy something that they do not need	Adapt from Yaakop, Azizul & Mohamed Anuar, Marhana & Omar, Khatijah & Liaw, Alphonsus. (2012)
D5	I able to obtain information that I want without any delay	Adopt from Liu, Y. (2003)
SECTION E	INTERACTIVITY	
E1	Online advertisements gives me the opportunity to respond in more than one way (e.g participate in ongoing campaign, click through to have detailed information etc)	Adapt from Gao, Qin & Rau, Pei-Luen & Salvendy, Gavriel. (2009)
E2	Online advertisements increase my curiosity towards the company and products	
E3	When I saw advertisement on a certain online platforms, I will usually share with my friends	Kujur & Singh, (2020)
E4	When I saw an online advertisement, I actively participate in liking and commenting the post	
E5	Online advertisements catch my attention among other contents	Adapt from Yaakop, Azizul & Mohamed Anuar, Marhana & Omar, Khatijah & Liaw, Alphonsus. (2012)

Table 1 above shows the list of the questions for the questionnaire. It consists of five parts and five questions that have been asked for every part in the questionnaire. Some of the questions have been adapted from the previous research and some of it is being adopted in order to answer the objective of the study. The questions are straightforward and easy to understand. It is easier for the respondents to answer the questions.

3.1 Reliability, Validity and Normality Test

In this research, for the pilot study, the questionnaire will be tested by using the 30 respondents to determine the reliability of the questionnaire. The reliability of the questionnaire is determined by looking at the calculation that has been calculated through SPSS (Statistical Package for the Social Science – a software package used for logical batched and non-batched statistical analysis)

3.2 Reliability Test

Table 2: Summary of Reliability Test

Section	Cronbach's Alpha (α)	N of Items
Section B: Informativeness	0.849	5
Section C: Entertainment	0.858	5
Section D: Credibility	0.810	5
Section E: Interactivity	0.765	5

Reliability of the instruments is an important part for the research. The researcher needs to ensure that the questionnaire that acts as the instrument of the research is reliable. It is because the data is gained from the questionnaire. If the research instrument is not reliable then the data gained from this research is not trustworthy. All questions were adapted and adopted from previous study which is in the same field of study. It is impractical to study the whole population; thus researchers do study on samples. The sample acts as the representative of the population itself. It is good to have a large sample size instead of small sample sizes. The sample size among 30 to 500 respondents is sufficient enough for researchers to carry on the research (Delice, 2010). Therefore, in order to ensure the reliability, validity and normality of the instrument, there were 30 respondents included for pilot study. The total reliability score was 0.919. As for Section B, The Informativeness value is 0.878, Section C - Entertainment scored 0.858, Part D - Credibility value is 0.810 and the last but not least Section E - Interactivity value is 0.765. The accepted value of Cronbach's alpha is 0.7. However, values above 0.6 are also accepted (Taber, 2018). It can be said that the higher the Cronbach's alpha value, the more reliable the data. As stated in Table 2, all the Cronbach's alpha is beyond 0.7 and this shows that the pilot test data are all reliable and the current study is able to proceed in order to obtain final data.

3.3 Normality Test

Table 3: Summary of Normality Test

Section	Skewness (-3 to +3)	Kurtosis (-10 to +10)
Section B: Informativeness	-0.749	-0.107
Section C: Entertainment	-0.090	-1.401
Section D: Credibility	0.357	-0.568
Section E: Interactivity	-0.042	-0.596

Table above shows the summary of normality tests using skewness and kurtosis. According to Suvarna Gawali, 2021, skewness essentially measures the symmetry of the distribution, while kurtosis determines the heaviness of the distribution tails. For Section B -

The Informativeness value of skewness is -0.749 and kurtosis -0.107, Section C – The Entertainment, value of skewness is -0.090 and kurtosis -1.401, Section D - The Credibility, value of skewness is 0.357 and kurtosis -0.568 and Section E - The Interactivity, the value of skewness is -0.042 and kurtosis -0.596. The use of skewness and kurtosis values is generally to check the normality.

3.4 Validity

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.689
Bartlett's Test of Sphericity	Approx. Chi-Square	50.528
	df	6
	Sig.	<.001

3.5 Data Analysis

Collected data were analyzed through statistical analysis using SPSS statistics.

4. RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

Table 4: Summary of Demographic of Respondents

Profile Characteristics	Frequency	Percentage
GENDER		
Male	44	44%
Female	57	57%
AGE		
26 – 30 years old	70	70%
31 – 35 years old	20	20%
36 – 40 years old	10	10%
MONTHLY INCOME		
< RM2,000.00	23	23%
RM2,000 - RM3,000	33	33%
RM3,001 - RM4,000	24	24%
RM4,001 - RM5,000	14	14%
> RM5,000	6	6%
EDUCATION LEVEL		
PHD	0	0%
Master Degree	9	9%
Bachelor Degree	65	65%
Diploma	20	20%
Others	6	6%
TIME SPENT ON INTERNET PER DAY		
< 30 minutes	1	1%
30 - 60 minutes	13	13%
60 - 120 minutes	26	26%
> 120 minutes	60	60%

Participants of this research are taken randomly by the researcher to answer the questionnaire, not based on their social class but based on their age group. Table 4 shows the frequency and percentage of each profile characteristic from the demographic section in the questionnaire. 100 respondents voluntarily took part in this questionnaire and the percentage of female respondents is higher which reaches 57% compared to male respondents which is only 44%. Most of the respondents are millennials with the majority (70%) aged between 26 to 30 years. 33% of them have RM2000 to RM3000 monthly income and 65% have bachelor degrees for their academic background. 60% of the respondents spent more than 120 minutes on the internet per day.

5. CONCLUSION AND DISCUSSION

In conclusion, there is no doubt that the millennials are spending their time mostly online. They even buy things through online platforms compared to visiting physical stores. The rise of online advertisements leads them to buying the things that they do not need just because they have been watching the online advertisements. Most of the respondents believe that advertisements help them to gain knowledge about certain products or services. The online advertisements are informative and they do not need to do the further research to learn more about the products or the manufactured company. Aside from that, the study supported the hypothesis that entertainment in online advertisements positively influences Malaysian millennials' buying decision. Respondents believe that they have been entertained by the advertisements and some of them like to watch it for a few times. Besides that, most of the researchers believe that people would buy unnecessary things just because they have been influenced by the advertisements that they see online. Not only that, millennials also share the advertisements that they saw on online platforms to their friends and families. The rise of the internet has made the process of buying easier as advertisers provide a lot of information and some of them allow audiences to communicate if purchasers have inquiries about a product or service provided. It is believed that consumers prefer two ways of communication other than just being a receptor. The feature in today's online platforms, gives consumers an opportunity to give feedback that can help the marketers to understand their target audiences.

The research is beneficial to Malaysian marketers for them to strategise new advertising strategy in order to market their products and services. Marketers should spend more budget to go online as millennials nowadays spend more time on online platforms. As millennials contribute half of the number in today's society, advertisers need to know what their preferences are as they have their own purchasing power. Hence, it is hoped that the future research will be able to conduct new research by using the data and information provided in this study.

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I-CReST 2022:068-026 - *Tazkiyat al-Nafs* as A Treatment of Mental Health Problems Due to COVID-19

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ABSTRACT

The mental health problems faced by the community since the COVID-19 virus hit the world and Malaysia are increasingly worrying all parties. The existence of this virus greatly affects the aspects of physical and mental health which are important elements of a human being. This study aims to highlight *tazkiyat al-nafs*/purification of soul as a method of treatment in dealing with mental health problems. This study uses the method of content analysis through the collection of data from primary and secondary authoritative sources related to *tazkiyat al-nafs* recommended by Islamic scholars. The results of the study explain that *tazkiyat al-nafs* is suitable to be applied to individuals who face mental health problems in order to return to normal and better life. This study produces a corpus of knowledge according to the views of Sufis in living a better life mentally and physically. Efforts in managing the stress of life experienced by the community nowadays through the appropriate approach need to be applied so that the problem of stress in life can be overcome and treated with effective methods in surviving life throughout the spread of COVID-19.

Keywords: Counselling; spiritual; tasawuf; mental health

1. INTRODUCTION

The rapidly spreading COVID-19 epidemic around the world causes considerable fear, anxiety, and uneasiness to the entire population in general, and to certain groups in particular. According to Dini Farhana Baharudin, Kalsom Ali, Mahanom A. Jalil & Arif Ainur Rofiq (2021) the COVID-19 pandemic that hit the world has forced the authorities to carry out strict emergency measures and sanctions to stop the virus from spreading further. Among the measures implemented include quarantine, setting social distances, curfews, and complete closure of the areas involved. Such actions need to be taken to prevent the virus from spreading and causing physical and mental health problems among the local community (Dini Farhana Baharudin, 2021).

According to Dini Farhana Baharudin, Kalsom Ali, Mahanom A. Jalil & Arif Ainur Rofiq (2021) the main psychological effect that can be observed is the increment in stress and anxiety. The World Health Organization (WHO, 2020) states among the psychological effects include the increment in cases of loneliness, depression, use of harmful substances, self-harm, suicide

attempts, mainly due to the need for social incarceration and quarantine that disrupt society's routine. This disorder affects all levels of society regardless of age, race, or gender. In addition, the effects of the family aspect can also be seen such as the breakdown of the household, the separation of the parent-child relationship, and the limitation to the support of a large family. According to Zubir Sulaiman (2020) the measures to control the spread of infectious diseases that have been implemented have caused the operations of companies and enterprises to be stopped for a certain period. This fact also contributes to the stress from an economic and psychological point of view due to the lack of sources of income.

By referring to the National Health and Morbidity Survey (2019) half a million people (2.3%) in the country among adults are found to suffer from symptoms of stress or depression. Of these, most affected individuals were individuals in the B40 group (2.7 per cent), followed by the M40 group (1.7%) and T20 (0.5%). At the same time, the 2019 National Health and Morbidity Survey also found that 424,000 children (7.9%) had mental health problems. Patron of Befrienders Kuala Lumpur, Tan Sri Lee Lam Thye in conjunction with the World Health Day 2020 celebration said, "Half of mental disorders are detected at the age of 14 and three-quarters of them in the mid-20s. Therefore, this matter needs to be addressed immediately" (Berita Harian Online, 2020).

According to Abdul Rashid Abdul Aziz, Amin Al Haadi Shafie, Zuraina Ali & Noor Dahiah Sulhana Dzainal (2020) the spread of COVID-19 has indeed had a negative impact in various aspects on the entire world community, including human mental health issues. This aspect of mental health is often overlooked and underestimated by our society because it is usually not physically manifested. However, when this problem occurs continuously over a long period of time, it will have an impact on physical health. Furthermore, the epidemic is seen as a frightening nightmare because it has changed the patterns of human life including the way they work, socialize, study, access to health care, shop and carry out activities of daily living. (Abdul Rashid Abdul Aziz, 2020).

Thus, this study aims to examine mental health problems during the COVID-19 pandemic by focusing on the spiritual aspects of finding solutions to recovery and changes in mental health problems.

2. MENTAL HEALTH

The World Health Organization (WHO) (2020) states that holistic health is not only focused on one aspect, but it is a condition that includes physical, mental, social health and not just seen from the absence of a disease.

Mental health is a state of well-being in which an individual is aware of his or her abilities, is able to handle stress well, is able to work productively and is able to contribute to society (World Health Organization (WHO), 2018). National Mental Health Policy (2012) defines mental health as the ability of individuals, groups and the environment to interact with each other to promote optimal subjective well-being and the use of cognitive, effective and relational abilities towards achieving individual and group goals that is in line with justice.

Abdul Rashid Abdul Aziz, Amin Al Haadi Shafie, Zuraina Ali & Noor Dahiah Sulhana Dzainal (2020) states that the level of mental health can influence the way a person thinks, behaves and feels. It also affects the way a person makes decisions and choices in life, solves

problems as well as interacts with others. When a person has a satisfactory level of mental health, the stresses of daily life will be addressed by thinking positively, calmly and not harming oneself (Abdul Rashid Abdul Aziz, 2020).

All of the above statements clearly show that mental health is capable of affecting a person's physical health, quality of life and productivity. Therefore, knowledge of mental health management is important because it will impact emotional and physical well-being as well as influence individual behaviour in certain situations.

Even so, there has been a significant increase in mental health issues every year. Statistics show that 2.3% of Malaysians aged 16 and above suffer from mental health problems. Minister of Health, Datuk Seri Dr. Adham Baba said, the National Health and Morbidity Survey study in 2017 also found that suicidal behavior among adolescents between the ages of 13 and 17 showed an increasing trend for the prevalence of suicidal ideation which was 10% compared to 7.9% in 2012 (Suraya Roslan, 2020).

Mental well-being is a very important matter because it is one of the *maqasid syariah* /Islamic legal doctrine which is the objective of Islamic law and is closely related to the mind that must be taken care of properly (Khairul Azhar Idris, 2014; Muhammad Afiq Abd Razak & Mohd Syukri Zainal Abidin, 2020).

In conclusion, physical health is closely linked to mental well-being. In fact, according to Nurul Naimah Rose and Mohd Yusri Mustafa (2018), physical well-being will not be achieved without mental well-being.

3. PSYCHOLOGICAL EFFECTS OF COVID-19

Mental health needs to be given attention as it can have various impacts on oneself. According to Haliza Abdul Rahman (2019), a person's life situation greatly affects their mental health which includes internal aspects such as thoughts, emotions, behaviors and external aspects such as relationships with others and the environment. This condition can be seen from the observation of certain characteristics through behaviors, ways of thinking, and emotional expressions that may categorize a person as suffering from mental disorders. Even if left untreated, it can lead to more serious mental illnesses such as depression, anxiety, schizophrenia and worse, eventually possibly leading to suicide attempts. According to Noorkumala Awang (2017), a report from the World Health Organization (WHO) found that mental illness is included in the top five illnesses listed as disability worldwide. The World Bank expects that among the major diseases that can threaten the lives of individuals in 2030 is clinical depression (Noorkumala Awang, 2017).

The spread of the COVID-19 is an unforeseen life situation that has a long-term psychological impact due to disruption from the routine aspect of habit. The changes that have taken place in terms of certain rules such as the Movement Control Order (MCO) have changed lifestyles and social relationships among community members. Various sections of society were affected by this impact including those who were quarantined, studying or working from home, as well as those who lost their jobs. According to Sri Ayu Kartika Amri (2020) in the first three months of the COVID-19 pandemic, the job loss rate was recorded to increase to 42% and led to 4% unemployment rate recorded in 2020 compared to 3.7% which occurred in the economic downturn in 2018. This issue also affects family finances in covering the cost of

education, childcare, medical costs, basic food and shelter needs. All these new challenging things can lead to mental disorder problems if not managed wisely (Rozita Talha, 2020).

According to the American Psychiatric Association (APA), a total of 62% of Americans experience COVID-19-related anxiety symptoms, and 59% state COVID-19 greatly affects their daily lives (Canady, 2020). Whereas in China, studies show that the psychological disturbances of the population in the country are more affecting the young, women, the elderly, and migrants (Jianyin Qiu, 2020). The findings of the library study found that during the COVID-19 pandemic, depression, anxiety, fear, acute stress disorder, post-traumatic stress, isolation, emotional exhaustion, and anger were among the significant mental health disorders seen among those affected by the COVID-19 outbreak (Brooks, 2020).

Looking at the situation in Malaysia, several recent research reports show that adults struggle not only to maintain their physical health but also their mental well-being with issues of stress, depression, and anxiety (Abdul Khaiyom, 2020; Perveen, 2020).

According to Dr Adham (Suraya Roslan, 2021), 2020 and 2021 are very challenging years and there is no denying the people affected psychologically and emotionally as a result of the COVID-19 pandemic. A total of 85.5% of the 145,173 calls received by government agencies from 25 March 2020 to 20 May 2021 were involving mental health issues that required emotional support and counseling such as acute stress, anxiety, depression, abuse and suicidal behavior. The report stated that among the causes identified were job loss, no source of income, family conflict, interpersonal relationship problems, stigma and lack of access to assistance services. Data from the Ministry of Health Malaysia (MOH) found that in the period from January to December 2020, a total of 1,080 cases of suicide attempts were reported to receive treatment at MOH hospitals (Suraya Roslan, 2021).

Among other issues related to this COVID-19 outbreak include anxiety disorder, post-traumatic stress disorder (PTSD), obsessive-compulsive disorder, and the effects of social isolation from quarantine isolation (Shanmugam, 2020).

Therefore, it is important to help the community members to improve their strategies in confronting and managing the issues they face especially if related to mental health such as depression, anxiety, and stress (Abdul Khaiyom, 2020). Among the recommendations is to use the spiritual therapy approach as an alternative to existing treatments.

4. TRIGGER FACTORS OF MENTAL HEALTH PROBLEMS

There are many new norms and social changes taking place in society following the spread of the COVID-19 epidemic such as the Movement Control Order and various other strict Standard Operating Procedures (SOP). The new norm situation during the COVID-19 outbreak has increased concerns over mental health as each individual needs to prepare and adapt to a different life than before. The changes in living conditions during the spread of COVID-19 also affected the community in terms of economic and social management. All of these are potential contributors to an individual's mental health problems.

The stresses and problems of life experienced by society today have a huge impact on their mental well-being. This happens when the stress cannot be managed well and there is no knowledge of proper mental and emotional management. According to Melissa Edora Sanu &

Balan Rathakrishnan (2019), among the factors that may contribute to this increase are due to financial problems, academic problems and family problems such as divorce and environmental factors. Mental health aspects are also often associated with emotional intelligence, behavioral strategy choices and psychological well-being. Mahadir Ahmad, Normah Che Din & Fauziah Shaari (2004) stated that stress caused by frustration such as loss of resources and failure or delay in achieving goals are likely to be manifested by subjects in various reactions such as behavioral reactions, emotional reactions and physiological reactions.

Failure in managing the mental health problems will lead to detrimental things such as suicide and criminal acts. Sinar Harian (2021) stated that the level of mental health among the people in the country needs to be given serious attention given the increasing number of suicide cases associated with stress due to the COVID-19 pandemic. Among the reported cases that also spread on social media, three suicides occurred on the same day on 16 June 2021, followed by 18 June.

The 'work from home' (WFH) initiative has become a new norm since the world was hit by the COVID-19 starting in late 2020. According to Rahman & Arif (2021), this measure is one of the government's efforts to curb the spread of COVID-19 and WFH mostly implemented during the period of the Movement Control Order (MCO).

Rahman & Arif (2021) stated that initially, WFH was hailed as a positive effort in supporting the government efforts in breaking the COVID-19 chain. As a result, there was a significant decrease in COVID-19 infection cases, as only part of the Malaysian population went out to work and most of them worked at home. However, over time, WFH is seen to begin to show negative effects, such as longer working periods, the burden of multiple roles (examples: as an employee and mother), role conflicts and burnouts (Rahman, 2021).

In fact, working from home (WFH) is a factor that increases physical risk. The examples of physical risks are sitting for long periods of time, unsafe body postures, prolonged exposure to screens and unergonomic workstations (Rahman, 2021). WFH is a big challenge to employees who have constraints in various aspects, such as small indoor space, many family members, noisy environment, limited technological facilities and less skills in using technology (Siti Marziah Zakaria, 2021). According to Vyas & Butakhieo (2021), for countries with high populations such as Hong Kong, Tokyo and Singapore, the area of houses in these countries is very small. These physical risks need to be given attention as they can affect health such as back pain, vision problems, carpal tunnel syndrome, tendonitis and mental health disorders (Vyas, 2021).

Referring to the factors that trigger mental health problems among students, during the spread of the COVID-19 epidemic, online learning methods are fully applied to replace conventional learning methods. Therefore, students need to have appropriate devices such as telephones and computers to continue the learning activities. Among the platforms used during online learning are Microsoft Teams, Google Meet, Google Classroom, Cisco Webex, WhatsApp, Telegram and other similar applications. All of these platforms require students' skills in using the applications. However, these learning applications and devices also sometimes cause problems during learning activities and this situation will put pressure on students due to weaknesses caused by the devices or the applications (Ibrahim, 2021).

The results of Ahad's study (2020) show that students experience more stress in terms of aspects of academic management. Students are less focused during the learning process, and they are easily feeling negligent in lessons when studying alone during the COVID-19 pandemic. As a result of the social isolation that was implemented, students interacted more with family members than peers and outsiders (Ahad, 2020).

Family happiness and well-being also play a significant role on students' emotions. Sham (2005) stated that a happy family will make adolescents' emotions more stable, but on the other hand if the family situation is not happy, then it also disrupts adolescent emotions. This matter can make them feel lonely (Sham, 2005).

Labrague (2021) states adolescents are more likely to experience extreme feelings of loneliness compared to adults. Wright (1967) states that this feeling of loneliness is one of the symptoms indicating that students are experiencing stress. In addition, poor quality sleep can also be a factor to mental health problems. Zhang (2020) found that students did not have quality sleep during the COVID-19 pandemic. This condition can indirectly result in them experiencing Post Traumatic Stress Symptoms (PTSS) (Liu, 2020).

Based on the results of previous studies, there are many factors that influence human mental health at the beginning of the emergence of COVID-19. Therefore, studies that focus on the treatment of this issue need to be focused for the benefit of all.

5. ELEMENTS OF *TAZKIYAT AL-NAFS* AS THE TREATMENT OF MENTAL HEALTH PROBLEMS

According to Mohd Aizat Shamsuddin (2018) the treatment of spiritual elements that are integrated between faith, *fiqh*/Islamic jurisprudence and *tasawuf*/sufism must be given attention in treating the human soul in order to develop mental well-being.

Among the important principles in *tazkiyat al-nafs* is to get closer to the creator of the soul, Allah SWT. According to Basri Ibrahim, Mohd Safri Al Azhari & Ahmad Tarmizi Taha (2013) among the important foundations in *tazkiyat al-nafs* based on the Quran, hadith and the practice of *salafus salih*/the righteous predecessors such as sincerity, strengthening faith, adherence to the Quran and Sunnah, *tawakal*/reliance on God, believing in *qada'* and *qadar*/believe of fate and destiny, and the hereafter. According to al-Ghazali (2010) the process of *tazkiyat al-nafs* involves the effort to purify the soul from the attributes of *mazmumah* (*al-takhalli*)/bad behaviour and the effort to adorn the soul with the attributes of *mahmudah* (*al-tahalli*)/good behaviour. *Al-takhalli*/to abandoned and turn away from all things that may distract from remembrance of God is a process that requires a high resistance effort that is the process of *mujahadat al-nafs*/to fight or remove vile things from personal or spiritual self by performing the prescribed acts of worship. On the other hand, *al-tahalli*/to adorn the Muslim character and spiritual with good things is a process of continuous training through the practice of virtue and this process is called *riyadat al-nafs*/the inner warfare against ego.

According to Basri Ibrahim (2013) *mujahadat al-nafs* is a strenuous effort to cleanse the soul from reprehensible traits or *mazmumah*. *Mujahadat al-nafs* is a method to resist and control lust and eliminate the reprehensible traits or *mazmumah* that exist in oneself such as jealousy, envy, anger, love of the world, arrogance, and ripples. Fariza (2017) states that

mujahadat is also a condition in obtaining guidance and direction from Allah SWT as Allah SWT says in Surah al-Ankabut verse 69 which means:

“And those who strive in Our (cause), We will certainly guide them to Our Paths, for verily Allah is with those who do right.”

(Surah al-Ankabut: 69)

Al-Ghazali (2000) states that Sufis obtain inspiration or path by prioritizing *mujahadat*, eliminating all reprehensible behaviors, severing all ties with the world and presenting themselves with sincerity to Allah SWT. The method of *mujahadat al-nafs* is suitable to be applied to treat all diseases related to the heart because it is done with methods of resistance. For example, the nature of anger is treated with the nature of forgiveness, arrogance is treated with the nature of *tawaduk*/submission, humility or being humble of one's nothingness before Allah S.W.T (Al-Ghazali A. H., 2000). The process of purifying the soul from the attributes of this *mazmumah* should involve efforts and practice of adorning the soul with the *mahmudah* attributes known as *riyadat al-nafs*.

Al-Ghazali (2000) states that *riyadat al-nafs* is an effort to train oneself to cultivate and adorn the soul with various noble practices. This process needs to be done gradually and through several stages. It starts with a simple or small noble practice up to a larger and complex level so that the noble practice at a higher level becomes easy because it is already commonly practiced (Al-Ghazali A. H., 2000). Al-Ghazali states that faith and deeds of worship are important aspects in this *riyadat al-nafs* process (al-Ghazali A. H., 2010).

According to al-Ghazali (2010) faith is an important aspect of human life because faith can have a positive effect on mental health. Faith is also the source of all goodness and a reflection of the noble component of Islam. Salasiah (2015) states that the process of strengthening faith involves efforts to strengthen confidence in the six pillars of faith, namely faith in Allah SWT, angels, messengers, the book, the Day of Judgment and belief in *qadha and qadar*. As for the aspect of acts of worship, Noor Shakirah (2008) quotes al-Ghazali's view by stating that worship plays an important role in strengthening faith, and also helps Muslims overcome the problems they experience. This is because worship can connect a servant directly to his creator.

Thus, the results of this discussion explain that the process of *tazkiyat al-nafs* contains two important components, namely *mujahadat al-nafs* and *riyadat al-nafs*. Both of these components are spiritual elements contained in *tasawuf*/Sufism. In addition to that, there is another process in this *tazkiyat al-nafs* that must be preceded by *mujahadat* and *riyadat al-nafs*, namely *muhasabat al-nafs*/to judge oneself by the book of Allah-The Quran.

According to al-Muhasibi (1990) the process of *muhasabat al-nafs* is an element that is very suitable to be applied to individuals who are facing stress. *Muhasabah al-nafs* is a process of evaluation of the soul and self-introspection that can be done through two conditions, namely the evaluation of past actions and future actions (Al-Muhasibi, 1990). According to Norfadilah & Zakaria (2013) reflection and evaluation on future actions is by observing and contemplating behavior. A person who always practices soul reflection and evaluation will easily gain awareness and always prevailing repentance. All the sins that have been committed will be avoided as much as possible and will not be repeated again. All these processes are good actions as a servant who always hopes the forgiveness and pleasure of Allah SWT.

Therefore, these three processes, namely *muhasabat*, *mujahadat* and *riyadat al-nafs* can be applied in an individual who is facing mental health problems. This is because, those who are in such a situation are able to act out of control and they can do unexpected things that can harm themselves and others.

Among the practices that can be implemented to strengthen the process of *tazkiyat al-nafs* is to increase *zikrullah*/remembrance of Allah SWT, recite and understand the verses of the Quran, comprehend the essence of the sunnah of Prophet Muhammad SAW and strive to increase knowledge as a fortress in facing pressure and stress (Norfadilah Abdul Rahman & Zakaria Stapa, 2013; Dewi Ainul, 2016).

In addition, human beings also need to return to Allah SWT by sharing the turmoil of the soul to Him and ask for forgiveness with full hope and remorse (Norfadilah Abdul Rahman & Zakaria Stapa, 2013). Dewi Ainul (2016) states that human beings who always strive to improve their spiritual quality will feel that Allah SWT is always with them in any situation. This will give strength to their souls and prevent themselves from acting out of control when under stress. According to Siti Norlina (2018) individuals who have problems in life will feel depressed and tension because of frustration with the stress of problems encountered in life. If they believe in the ordinances and provisions of The Creator, and consider the problem is a test from Allah SWT, they will be patient and grateful for the test they faced.

It is undeniable, when an individual suffers from a serious mental health problem, he or she should be referred to a psychiatrist for a process of treatment and rehabilitation. This method is a process to provide a feeling of peace and eliminate anxiety in the patient's soul. However, although various methods have been tried to achieve this goal, the beneficial effects on mental health cannot be produced perfectly (Muhammad Uthman Najati, 2001). This means, other alternatives also need to be taken in dealing with this issue. Therefore, the method of treatment related to mental health problems by learning knowledge and Sufism and implementing good practices through the process of *tazkiyat al-nafs* should be implemented, so that one's spiritual condition is in a good state and at the same time able to control mental and emotions.

6. CONCLUSION

The National Mental Health Policy (2012) targets several objectives in producing a balanced and healthy society in terms of psychology which among the objectives is to provide a foundation, planning strategy and program implementation for the purpose of improving mental health and well-being of citizens holistically. In addition, among its objectives are to improve mental health services for at-risk populations, improve psychiatric services, and strive to provide mental health care to individuals, families, communities and related bodies through campaigns and programs conducted. The National Mental Health Policy (2012) also emphasizes the research aspect where this policy strongly encourages research and development programs towards improving the mental health aspects of the people. Thus, the application of the concept of *tazkiyat al-nafs* is very suitable to be implemented in dealing with mental health problems. The mental health problems experienced by an individual should not be underestimated as they can lead to harm oneself and others. Therefore, the treatment methods of soul, emotional, spiritual, moral and mental behavior are very important to be applied in society, based on the Quran and Sunnah as well as the views of authoritative scholars. The concept of *tazkiyat al-nafs* which is based on three main processes, namely *muhasabat*,

riyadat and *mujahadat al-nafs* is an appropriate method to treat mental health problems faced by society today, at the same time offering physical and mental health to live a quality life.

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I-CReST 2022:071-047 - The Usage of Instagram and Its Impact on Women's Appearance and Lifestyle in Malaysia

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Abstract

Instagram is one social media that has a lot of users and is being used worldwide. Instagram helps people to stay connected with their smartphones at any time. People update their photos and video on Instagram daily to share their activities and attract an audience to see them. Most influencers gain their follow through their social media activity, especially on Instagram. There are complications, which is the usage of Instagram gives an impact on women's self-esteem as they see the beauty standard that is being implemented in social media. Therefore, the present study aims to identify the usage of Instagram and its negative impact on women's appearance and lifestyle. Quantitative research has been conducted by distributing the questionnaire to 100 respondents. Simple random sampling was used in the present study to obtain respondents' numbers. The data is only eligible to those using Instagram. Findings show there is a correlation between the usage of Instagram and women's appearance with correlations results $>.50$. Results show the usage of Instagram leads to a negative impact on women's appearance. The negative impact of Instagram, women strive to satisfy beauty standards set on social media by following an excessive diet to get their ideal body.

Keywords: Instagram; women; appearance; lifestyle

1. INTRODUCTION

The industrial revolution has brought changes to human life, especially with the usage of technology such as smartphones. People can easily be connected around the globe. People obtain information from their smartphones via social media sites such as Facebook, Twitter, and Instagram. Social media users provide numerous types of information via text, photos, music, and video. Instagram (40 percent), and Pinterest (31 percent), were the most popular image-based platforms [1]. Instagram has exceeded 800 million active users globally. People use social media to interact with others and follow up on the current news.

Users can use social media to share a variety of content in text, photos, music, and video. Instagram is a photo and video-sharing social network service owned by Facebook, Inc [1]. It is a social media platform that supports users' social behaviors, such as digital communications, engagement, leisure, and enjoyment. Through social media, people are connected with face-to-face communication and digital communication online and offline. Instagram's success as a top mobile app is due to its quickness and simplicity for the younger generation [2]. Undoubtedly, social media plays a vital role in human lives.

During the outbreak, people began to spend more time on social media, which increased the number of people using their smartphones. 1046 photos are published on Instagram every second [3]. People choose visual-based rather than text-based, which leads to excessive viewing on social media, especially on Instagram. When social media users are exposed to photographs and videos, the visual material increases sensory information and experiences, which are then stored in working memory[4]. Images content-based receive more viewers leading them to imitate the images replay in their minds.

Furthermore, Instagram negatively affects women, especially regarding their body image, as they tend to believe in the media post. The thin ideal has dominated White-centered mainstream media as the cultural ideal for beauty, with slim, flat-stomach, small-waisted female physiques[5]. Instagram and other social media platforms have created a new media environment to spread appearance ideals[6]. Media often inject the image of thin body image as a beauty standard for women, which might lead to an excessive diet.

People become active users who strive to have the same body image and lifestyle as influencers. The most important part of social media for body image is undoubtedly the photo-based aspect, viewing, and uploading. Exposure to thin-ideal media representations in television and magazine images has been proven to contribute to thin-ideal acceptance and appearance comparisons, resulting in body image issues and disordered eating behaviors in women.

Instagram allows its users to upload images and videos on the applications. People set their beauty standards on body image through these platforms from seeing the influencer accounts. This influences the users' body image as they tend to imitate the picture they see. Women are highly cautious in the version they present on social media, where they only upload the most appealing versions of themselves. This leads to a negative impact on women's daily lifestyles[7]. Women's utilization of social media is linked to body image issues and disordered eating. This alarming situation needs to be prevented to ensure the safety of women [8].

Instagram is different from other social media such as Facebook and Twitter as Instagram is more photo-based, which provides its user the opportunity to share their picture. Instagram's users are presented with unreasonable expectations. Experimental research has also shown that exposure to unrealistic Instagram photographs of thin and attractive women increases subjective body dissatisfaction compared to standard control images [8]. This indicates that excessive usage of Instagram can give a negative impact on its audience. Therefore, the present study aims to meet below objectives: -

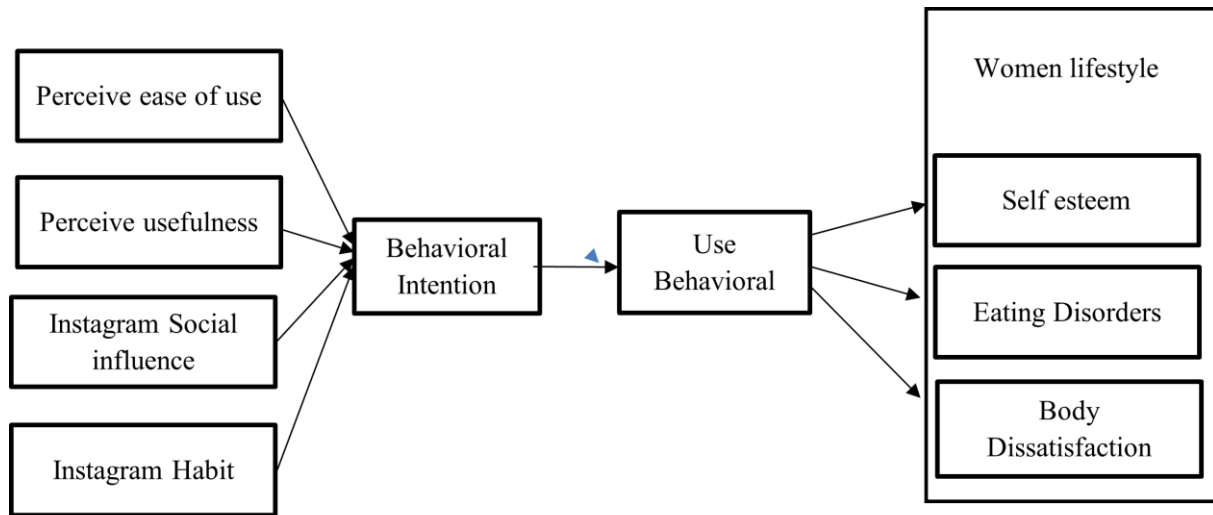
- RO1: To Explore the Use of Instagram Among Women in Malaysia.
- RO2: To Identify the Impact of Instagram Towards Women Lifestyle.

1.1 Research Conceptual Framework



Figure 1: Illustration of the conceptual framework on The Usage of Instagram and its impact on women's appearance and Lifestyle in Malaysia.

The conceptual framework above, shows the relationship on how of Instagram use affect women's lifestyle.



Source: Venkatesh, 2003

Source: Evans, 2021

Figure 2: Illustration of the research framework adapted from UTAUT2

Framework above indicates that perceive ease of use, perceive usefulness, Instagram social influence relate with behavioral intention on using Instagram. Hence, it relates with the intention to use Instagram that affect women lifestyle. The use behavioral of Women is through women lifestyle, self-esteem, eating disorders and body dissatisfaction

1.2 Hypotesis:

- H1** – There is a significant relationship between Perceive ease of use of Instagram and behavioral intention in women lifestyle.
- H2** - There is a significant relationship between Perceive usefulness of Instagram and behavioral intention in women lifestyle.
- H3** – There is a significant relationship between Instagram Social influence and behavioral intention in women lifestyle.
- H4** - There is a significant relationship Instagram habit and behavioral intention in women lifestyle.
- H5** - There are significant relationship between behavior intention and use behavior in women lifestyle.
- H6** – There are significant relationship between use behavioral and self-esteem in women lifestyle
- H7** – There are significant relationship between use behavioral and eating disorders in women lifestyle
- H8** – There are significant relationship between use behavioral and drive for thinness
- H9** – There are significant relationship between use behavioral and body dissatisfaction

2. LITERATURE REVIEW

2.1 Self-Esteem

Instagram has become one of the most popular applications worldwide. The user-friendly features help its users to stay connected with others anytime and anywhere. In addition, features on Instagram, such as filters, help to improve people's faces and make them look more attractive. Filters and other augmented-reality tools make it easier than ever to shape-shift their face and make viewers reconsider their natural appearance [9]. Women tend to use filters on Instagram to enhance their beauty to achieve the beauty standard shown on Instagram. Instagram is primarily a visual platform where women and girls are subjected to unrealistic and idealized standards [10]. Thus, women tend to believe in unrealistic beauty standards that are injected into their minds.

Furthermore, Instagram is a highly visual world where people present themselves through a photo that indicates their online presence and shows that they manage to accomplish the standard beauty appearance on social media. A search on Instagram for the hashtag #fitspiration yields 19.2 million results, while a search for the abbreviated form #fitspo yields 73.4 million results, indicating the abundance of fit-ideal photos on social media [5]. Women tend to search on Instagram regarding new fashion trends and new makeup tools to upgrade themselves to be better. This influences women since it causes low self-esteem because they do not meet the standard beauty of body image that they desire.

Women had higher self-esteem declines after getting attractiveness-threatening comments than males, and their self-esteem is more significantly predicted by their rated facial attractiveness [11]. Body dissatisfaction, a desire for thinness, and internalization of the thin ideal presented in media are all positively connected with exposure to appearance-related Internet information. In addition, women tend to have low self-esteem whenever they want to take selfies or videos without filters. This can lead to feelings of insecurity and a sensation of being distanced.

2.2 Eating Disorders

According to research, the more time women spend on Instagram, the more likely they will engage in eating disorder behaviors. By following a strict diet, they can achieve the body image they want. Social media appears to encourage young people to place a high value on their appearance and how others judge or view it [12]. Social media is known to influence people on body image. Adolescents might develop eating disorders due to the desire to share only the best moments and the pressure to seem perfect [13]. This has a bad influence on the person itself and the community as people quickly absorb what social media implemented

In addition, fear of becoming overweight led to the development of eating disorders as a result of women's unfavorable body image. Females in their early adolescence who altered their photos before publishing them on social media reported stricter food restrictions [14]. People who suffer from this eating disorder such as anorexia drastically restrict their food intake. Alongside with the usage of Instagram which is more photo-related, people tend to view more pictures that are being taken by others and compare with themselves. Seeing other people's selfies on social media makes people aware that others may see and judge their own selfies, which adds to the social comparison stress [15]. Instagram was discovered to have the biggest and

second-greatest negative net effects on wellbeing. Instagram provides a wide range of ways for users to engage with images that show thin images. Most women engage with social media which enhances their stereotype that is associated with eating disorders and body image concerns.

2.3 Negative Body Image Affects Women

Instagram that are more related to photo-based are often used by women, which influences them to negativity. Diversity of contents related to physical appearance in a social network makes it easier for negative emotional responses to appear, which not all users know how to manage with adaptive emotion regulation strategies [16]. Self-promoting on Instagram is also done by the women to build their fan base and followers. Instagram use has been claimed to have more significant detrimental effects on body image than other social media platforms with more diverse material and activity. Instagram is home to a diverse group of models and peers who frequently post idealized images of themselves.[16]

Women and young girls now live in a culture where their body determines their identity. Women tend to feel afraid to gain weight as they feel they can easily gain weight which leads them to feel insecure with their own body image. Women often being bombarded with the image in the Instagram that show on plastic surgery image that makes them get influence and think that their body do not meet the expectations on current beauty standards. To build their own body image, women tend to think that they need to change their appearance to build up their self-esteem. It might be tough to stay away from pictures and messages that make women feel bad about them.

2.4 Instagram Changes Women Habit

Instagram changes the habit of people towards their daily basis activities. The temptation of "likes" and "upvotes" can lead to a habit of continuous checking that interferes with personal objectives, especially for people who are socially anxious or have poor self-esteem [17]. People tend to fulfill their social needs rather than their daily life activities. The difficulty to manage social media usage is linked to habit strength [17]. This change has brought differences in their life. This habit on Instagram have develops problem in daily life such as procrastinate and distracted driving. Life has obviously become lot faster than it has ever been as a result of technological advancements, and there is a push to move quickly, eat quickly, and live swiftly.

3. METHODOLOGY

This research uses a quantitative method approach by providing respondents with a set of questionnaires. The researcher used probability sampling. An online survey link was distributed to the sample through social media such as WhatsApp, Facebook and Instagram which is focused on Instagram users. The samples are mainly active on social media, thus it will be easier to reach them using the platform. This research design is chosen because it helps to gain answers from the sample directly and does not consume too much time and follows the SOPs. Other than that, this study is also supported by supporting details by a number of scholarly journals that are related to the topic which can help to strengthen the result of the research.

3.1 Research Instrument

The study uses questionnaires as the research instrument. the participants are required to complete an online survey with a series of questions to be answered using the Likert scale. Each of the sections will have to be answered with the 5-likert scale rating from Strongly Agree [1], Disagree [2], Neutral [3], Agree [4] and Strongly Agree [5]. The information gathered will be analyzed using SPSS and provided in the conclusion and discussion section.

3.2 Population And Sampling

As the study focuses on the Instagram application, whose majority of its users are aged between 20 - 50, the sample characteristics for the respondent will focus on women who work in private sectors, government sectors, and are unemployed. Researcher using non-probability sampling. This research will use convenient sampling due to time restraint that needs to be fulfilled and number of respondents that easily can be reached. This study will require 100 respondents to participate as it helps to achieve the research objectives.

3.3 Instrument Development

A pilot study will be conducted prior to the real survey to ensure the relevance and reliability of the survey and the questions. For the pilot study, the survey will be handed out to 30 participants. A close-ended questionnaire was constructed to collect data from the respondent. There were eleven sections of questions asked which consist of section A, demographics of the respondent. Section B, C, D, E, F, G, H, I, J and K, consist of questions to fulfill research hypotheses. Each of the sections will have to be answered with the 5-likert scale rating from Strongly Agree [1], Disagree [2], Neutral [3], Agree [4] and Strongly Agree [5].

Table 1: Research Question

Part	Questions	Sources
B	B1 - Instagram is easy to access anytime.	[18][19]
	B2 - Instagram is easy to post picture	
	B3 - Instagram is user friendly	
	B4 - Instagram helps me to gain information	
	B5 - I think that interacting with Instagram is clear and understandable.	
C	C1 - Instagram is useful for better expressing myself.	[19]
	C2 - Using Instagram increase my unproductive time	
	C3 - Using Instagram increase my concern towards my lifestyle.	
	C4 - Using Instagram decrease my appetite to eat	
	C5 - Instagram improves my body proportions	
D	D1 - My peers thinks that I should use Instagram	[20]
	D2 - I think using Instagram is following the trend	
	D3 - People who influence my behavior think that I should use Instagram for my lifestyle changes	
	D4 - People who are important to me think that I should use Instagram	

	D5 - Most people surrounding with me use Instagram	
E	E1 - I am addicted to Instagram E2 - Using Instagram is a part of my daily routines E3 - Using Instagram has become habit to me E4 - Using Instagram where I do without thinking E5 - I am addicted to use Instagram for dieting	[20][21][22]
F	F1 - I intend to continue using Instagram in the future F2 - I like to use Instagram to view photo F3 - I plan to use Instagram to search regarding diet F4 - I try diet plan on Instagram F5 - I plan to follow fitness account on Instagram in the future	[23][24][25]
G	G1 - I will edit my photos before uploading in Instagram G2 - I feel bothered if someone unfollow me G3 - I feel annoyed when people do not like my posting G4 - I often check my Instagram account to follow the trend (Eg: K-pop, fashion, diet) G5 - I use Instagram to see the updates of those I follow	[26][27][28]
H	H1 - I do not aware on time I spend on Instagram H2 - I do not aware on time I spend on Instagram H3 - I follow the content I am interested in from Instagram H4 - I enjoy spending time in social networking site. Eg: Instagram H5 - I want to view Instagram starting at early hours of a day.	[28]
I	I1 - I wish I could have more respect for myself I2 - I feel that I have numbers of good quality I3 - I regularly find myself comparing how I look to others I4 - I have positive attitude towards myself as a person I5 - I am just as good and as capable as anyone else I know	[29][30]
J	J1 - I eat sweets and carbohydrates without feeling nervous J2 - I think about dieting J3 - I feel extremely guilty after overeating J4 - I am terrified of gaining weight J5 - If I gain a pound, I worry that I will keep gaining	[31][6][32]
K		[31][33]

-
- K2 - I think that my thigh are too large
 K3 - I think my stomach is just the right size
 K4 - I feel satisfies with the shape of my body
 K5 - I think that my thigh are just the right size
-

The table 1 above show, questionnaire that consist of five questions in each section of the questionnaire. The question being adopted and adapted from previous researcher.

3.4 Reliability, Validity and Normality Test

Table 2: Summary of Reliability Test

SECTION	CRONBACH ALPHA	N OF ITEM
B. PEOU	0.867	5
C. POU	0.644	5
D. Social Influence	0.814	5
E. HABIT	0.931	5
F. BI	0.808	5
G. User Behaviour (UB)	0.773	5
H. Women Lifestyle	0.882	5
I. Self-Esteem	0.620	5
J. Drive For Thinness	0.661	5
K Body Dissatisfactions	0.524	5

Table 2 shows that the majority of the variable available in the questionnaire met its internal consistency with Section B – PEOU value 0.867 (Very reliable), Section C- POU value 0.644 (Reliable), Section D – Social influence value 0.814 (Reliable), Section E - Habit value 0.931 (Very Reliable). Section F – Behavioral Intention (BI) value, 0.808 (Reliable), Section 6 – User Behavior (UB) value, 0.773 (Reliable). Section H – Women Lifestyle value – 0.882 (Very reliable), Section I - Self-esteem value, 0.620 (Reliable), Section J – Drive for thinness value, 0.661 (Reliable). Section K – Body dissatisfactions value, 0.524 (Reliable) A reliability score above 0.4 is acceptable index.[34] This shows that the results of the pilot test were entirely accurate, allowing the present research to continue to collect final results.

3.5 Normality Test

Table 3 shows the normality test using skewness and kurtosis. The normality is a significant consideration when choosing the statistical techniques for data analysis and the measures of central tendency[35]. The table shows that the majority of the variable available in the questionnaire met its acceptable values of Skewness in between -3 to +3 with Section B – Perceive ease of use value of skewness -1.045 and kurtosis value, 0.195, Section C- POU value skewness, -0.049 and kurtosis value, -0.058, Section D – Social influence value of skewness, -0.054 and kurtosis value, -1.149, Section E - Habit skewness value, -0.020 and kurtosis value, -1.060. Section F – Behavioral Intention (BI) skewness value, 0.007 and kurtosis value is -1.151. Section G – User Behavior (UB) skewness value, -0.598 and kurtosis value, 0.529, Section H –Women Lifestyle skewness value, -0.264 and kurtosis value -0.300, Section I – Self Esteem skewness value, 0.063 and kurtosis value, -0.902, Section J - Drive for Thinness skewness value, -0.445 and kurtosis value, -0.451. Section K- Body Dissatisfactions skewness value, 0.216 (Poor) and kurtosis value, -0.393.

Descriptive statistics may be used to examine skew and kurtosis. When using SEM, skewness values should be between -3 and +3 and kurtosis values should be between -10 and +10 [36].

Table 3: Summary of Normality Test

SECTION	SKEWNESS (-3 TO +3)	KURTOSIS (-10 TO +10)
B. PEOU	-1.045	0.195
C. POU	-0.049	-0.058
D. Social Influence	-0.054	-1.149
E. Habit	-0.020	-1.060
F. BI	0.007	-1.151
G. User Behaviour (UB)	-0.598	0.529
H. Women Lifestyle	-0.264	-0.300
I. Self-Esteem	0.063	-0.902
J. Drive For Thinness	-0.445	-0.451
K. Body Dissatisfactions	0.216	-0.393

3.6 Data Analysis

The data collected through pilot test will be analyzed. Collected data were analyzed through statistical analysis using SPSS statistic. The quantitative data collected to confirm that the participant in an online survey has properly responded to all the questions.

4. RESULT AND DISCUSSION

4.1 Demographic Profile of Respondents

Table 5 : Summary of Demographic of Respondents.

Profile Characteristics	Frequency	Percentage
Gender		
Male	20	21.0%
Female	80	40.0%
Age		
20 - 25	79	39.5%
26 - 35	19	9.5%
36 - 50	2	1.0%
Race		
Malay	96	48.0%
Chinese	2	1.0%
Indian	2	1.0%
Higher Education Level		
SPM	4	2.0%
Asasi/Matriculation/A-Level/STPM	6	3.0%
Diploma	26	13.0%
Degree	56	28%
Master	8	4.0%
Occupation		
Student	66	33.0%
Private Sectors	26	13.0%

Government Sectors	1	0.5%
Self Employed	4	2.0%
Unemployed	3	1.5%
Do you use Instagram on your daily basis?		
Yes	86	43.0%
No	14	7.0%
Do you follow any fitness account on Instagram?		
Yes	48	24.0%
No	52	26.0%

Table 5 shows the frequency and percentage of each profile characteristics from the demographic section. Profile characteristic for Gender, the percentage of female is 40% higher than male. For age, 29 – 25 respondent is 39.5% higher than other two options. Most of the respondent is 48%. The higher education is degree which is 28%. Student is the highest respondent at 33%. Most of the respondent use Instagram on daily basis by 43%. There are slightly different in the user who do not follow fitness account in Instagram, by 26%.

4.2 Pearson Correlation Analysis

Table 6: Summary of Pearson Correlation

No.	Relationship	Pearson Correlation (r)	Interpretation	Status
B1	Perceive ease of use and Behavior Intention	0.403	Moderate correlation	Accepted
C1	Perceive of Usefulness and Behavior Intention	0.581	Moderate correlation	Accepted
D1	Social Influence and Behavior Intention	0.454	Moderate correlation	Accepted
E1	Habit and Behavior Intention	0.632	Strong correlation	Accepted

4.2.1 B1: Perceive ease of use (PEOU) > Behavioral Intention (BI)

Based on the table, perceive ease of use and Behavior Intention on Instagram is 0.403 in correlation coefficient. This is confirmed that perceive ease of use has a significant impact toward behavior intention of women lifestyle. Hence, perceive ease of use and behavior intention is a moderate coefficient relationship. The value 0.403 is categorized in moderate coefficient relationship. The result found that Instagram is easy to use that relate with behavior intention which makes change in women's lifestyle.

4.2.2 C1: Perceive of usefulness (POU) > Behavior Intention (BI)

The value of correlation between Perceive of usefulness and behavior intention on Instagram is 0.581. The value of 0.581 is categorized in moderate coefficient relationship. The value has shown there is a relationship between independent and dependent variable. Therefore, perceive of usefulness is supported. Perceive of usefulness is the degree to which a social media user

thinks that utilizing a certain social media platform helps them achieve their relevant goals.[23]. Hence, perceive of usefulness give an impact towards women's lifestyle.

4.2.3 D1: Social Influence (SI) > Behavior Intention (BI)

The table above show that social influence and behavior intention on Instagram is 0.454 in correlation coefficient. Social influence and behavior intention is a moderate coefficient relationship. Its generally indicates that one person's action becomes a prescription for the direction of another person's conduct [27]. People's decision to use Instagram is heavily impacted by the opinions of people they consider to be influential, allowing these people to change women's intentions for using new technologies.

4.2.4 E1: Habit > Behavior Intention (BI) 0.632

Based on the table, Habit and behavior intention on usage of Instagram and impact on women's lifestyle is 0.632 in correlation coefficient. This indicates that habit has significant impact toward behavior intention of Instagram. The value of 0.632 is categorized in a strong coefficient relationship. Habit is a term for habitual conduct that occurs without conscious thought or with little mental effort [38]. As a result, women use Instagram in their daily life, for dieting plan, they will rely on Instagram and their beauty standard in the platforms.

4.3 Regression Analysis

Table 7: Summary of Regression

No	Relationship	Regression (R)	R ²	Durbin Watson	Interpretation
H1	Perceive ease of use (PEOU) and Behavior Intention	0.403	0.162	2.116	R = 0.403 (Low Correlation) with R ² = 0.162(16.2%) and Durbin Watson is acceptable = 2.116
H2	Perceive of usefulness and Behavior Intention	0.581	0.338	2.154	R = 0.581 (Moderate Correlation) with R ² = 0.338(33.8%) and Durbin Watson is acceptable = 2.154
H3	Social Influence and Behavior Intention	0.454	0.206	2.197	R = 0.454 (Low Correlation) with R ² = 0.206 (20.6%) and Durbin Watson is acceptable = 2.197
H4	Habit and Behavior Intention	0.632	0.400	2.160	R = 0.632 (Moderate Correlation) with R ² = 0.400(40%) and Durbin Watson is acceptable = 2.160
H5	User Behavior and Behavior Intention	0.227	0.220	1.939	R = 0.227 (Low Correlation) with R ² = 0.220 (22%) and

					Durbin Watson is acceptable = 1.939
H6	Use Behavior and Women Lifestyle	0.631	0.398	1.732	R = 0.631 (Low Correlation) with $R^2 = 0.398$ (39.8%) and Durbin Watson is acceptable = 1.732
H7	Use Behavior and Self-esteem	0.491	0.241	1.714	R = 0.491 (Low Correlation) with $R^2 = 0.241$ (24.1%) and Durbin Watson is acceptable = 1.714
H8	Use Behavior and drive for thinness	0.495	0.245	1.575	R = 0.495 (Low Correlation) with $R^2 = 0.245$ (24.5%) and Durbin Watson is acceptable = 1.575
H9	Use Behavior and Body Dissatisfaction	0.319	0.102	1.525	R = 0.319 (Low Correlation) with $R^2 = 0.102$ (10.2%) and Durbin Watson is acceptable = 1.725

The hypothesized relationships were tested using linear regression. It is possible to examine the relationship between variables using regression analysis [39]. The linear regression for Perceive ease of use (PEOU) > Behavior Intention demonstrates that this hypothesis (H1) explains R^2 is 0.162 (16.2%) regress the relationship between both variables. This indicate there are others factor that can be used to determine the usage of Instagram impact on women's lifestyle. The Durbin Watson for this hypothesis is 2.116. The linear regression for Perceive of usefulness (POU) > Behavior Intention demonstrates that this hypothesis (H2) explain R^2 is 0.338 (33.8%) regress the relationship between both variables. This Durbin Watson for this hypothesis is 2.154, which mean they are acceptable.

For Hypothesis (H3), linear regression explains R^2 is 0.206 (20.6%) regress the relationship between both variables. The Durbin Watson for this hypothesis is 2.197, which mean they are acceptable. Next, the linear regression demonstrates that this hypothesis (H4) explains R^2 is 0.400 (40%) regress the relationship between both variables. The Durbin Watson for this hypothesis is 2.160, which mean they are acceptable. The linear regression for Behavior Intention > User Behavior (UB) demonstrates that this hypothesis (H5) explains R^2 is 0.220 (22%) regress the relationship between both variables. The Durbin Watson is 1.939, which mean they are acceptable. The hypothesis (H6), explains R^2 is 0.398 (39.8%) regress the relationship between both variables. The Durbin Watson is 1.732, which mean they are acceptable. The hypothesis (H7), explains R^2 is 0.241 (24.1%) regress the relationship between both variables. The Durbin Watson is 1.714, which mean they are acceptable. For Hypothesis (H8), the hypothesis explains R^2 is 0.245 (24.5%) regress the relationship between both variables. The Durbin Watson is 1.575, which mean they are acceptable. For H9, the hypothesis explains R^2 is 0.102(10.2%) regress the relationship between both variables and Durbin Watson is 1.725, which mean they are acceptable.

5. CONCLUSION AND DISCUSSION

5.1 Objective 1: To Explore the Use of Instagram Among Women in Malaysia.

In conclusion, the result for Pearson correlation for habit and behavior intention (E1) has the highest correlation value which is 0.632, this means its strong correlation. This indicates that the use of Instagram among women are affected by their habit. The other factors, perceive ease of use and behavior intention (B1) has the lowest value which is 0.403. The value is moderate correlation. This indicates that perceive ease of use has lowest impact towards behavior intention. The second highest value is perceived of usefulness and behavior intention (C1), which is moderate correlation with the value of 0.581. Social influence and behavior intention (D1) correlation result shows that 0.454 which is moderate correlation. This indicate that social influence has low impact on behavior intention of using Instagram. Thus, most women desire to have the same body proportions by adhering to their diet plan through following fitness accounts on Instagram since the society is bombarded with the standard beauty ideal. By using Instagram daily, their habit towards their lifestyle changes based on factors identified above.

5.2 Objective 2: To Identify the Impact of Instagram Towards Women Lifestyle.

In addition, regression already conducted, where the result of regression shows the highest is use behavior (UB) with women lifestyle. The regression shows that use behavior (UB) with women lifestyle have 39.8% regress between variables. This also answered the hypothesis of the study, there are relationship between use behavioral and women lifestyle that led to changes of women's lifestyle. Instagram has become one of their daily routines and they intend to use Instagram for dieting plan. This result also supports the objective of the study which is Instagram has an impact of Instagram towards women lifestyle.

The second highest regression is use behavior and drive for thinness. The value for regression for two variable is 24.5%. The impact of use behavior toward drive for thinness is low than the first factor. The third highest value of regression is use behavior and self-esteem. The value regression for two variable is 24.1%, which mean the impact of use behavior and self-esteem is low. The lowest regress is between use behavior and body dissatisfaction The value shows, 10.2%, which mean the impact behavior intention towards body dissatisfaction is low.

When evaluating the findings of this study, several limitations must be highlighted. Despite the fact that a number of the coefficients were significant, they only make a small difference in the dependent variables. Due to time restraints, not enough data were collected. This study also concentrates on the general research on Instagram usage that impact women's lifestyle. This research, is mainly highlighted Instagram impact on women lifestyle. Future studies need to investigate the impact of Instagram towards body image in different gender. This can give different view on both genders.

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I-CReST 2022:110-085 - Job Satisfaction Index Among Academics and Non-Academics Staff in TVET Institution

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ABSTRACT

The combination of environmental circumstances, and psychological and physiological may affect how people feel about their job. Lacking job satisfaction from one aspect may impact employees' motivation and commitment to the organization including in Polytechnic Kuching Sarawak. However, there is very limited research conducted to focus on the job satisfaction index in Polytechnic Kuching Sarawak in the context of both academics and non-academics staff. Therefore, the objective of this study is to identify the job satisfaction index among academics and non-academics staff in Polytechnic Kuching Sarawak (PKS) is conducted. A total of 218 respondents answered the survey using the Job Satisfaction Survey (JSS) by Spector in 1997 and the quantitative method was employed. The results show that PKS's employees are satisfied with supervision, nature of work, coworkers, pay, and communication subscale. The areas that they most satisfied were coworkers, the people they work with, and their supervisor. While this study also found that the employees were ambivalence about contingent rewards, promotion, fringe benefits, and operating conditions. However, there are some areas that they are dissatisfied which are many of the institution's rules and procedures that make doing a good job difficult, having too much to do at work, and having too much paperwork. The outcome of this research may guide decision-makers to improve job satisfaction among academics and non-academics staff in Polytechnic Kuching Sarawak.

Keywords: Job satisfaction index; academics; non-academics; polytechnics; subscales

1. INTRODUCTION

The educational system of any country is extremely important in society, especially in terms of information generation. Most of the information transmission occurs in higher education institutions. There are two sorts of higher education institutions in any socio-economic system: public and private [1]. The quality of higher education includes not only procedures and activities, but also the quality of all employees, including teaching and administrative staff. According to [2], more than ever, teaching staff must be able to recognize what has to be changed and implemented in their job to adapt to new educational trends.

Job satisfaction is an attitude that presents itself at work as individual employee behavior and has the potential to influence the company and organizational behavior. High job satisfaction in work is usually able to improve employee performance, and dedication to the business, minimize absenteeism, and develop a passion for their work. In both the corporate and governmental sectors, as well as in developed and developing nations, it is critical [3].

[4] have defined job satisfaction as to how people perceive their job and the employing organization. An individual may be satisfied with one aspect but not another according to [5], there are various aspects of job satisfaction. As stated by [6,7], it has been long known that job satisfaction can affect employee commitment and performance. As one of Malaysia's technical and vocational education and training (TVET) providers, Polytechnic Kuching Sarawak (PKS) needs to ensure that the human capital is committed and performs well to produce quality TVET graduates. Available research only focuses on certain criteria of job satisfaction. There has been no comprehensive study of the job satisfaction index among employees in PKS which include both academic and non-academic staff. Therefore, this research aimed to determine the job satisfaction index among PKS employees, with a focus on academic and non-academic staff. Hence, the outcome of this study will provide knowledge to the organization on the well-being of its employees and thus encourage the organization to continuously provide a positive working environment.

2. LITERATURE REVIEW

The Job Satisfaction Index is a survey that measures how satisfied employees are in the workplace. By doing a Job Satisfaction Survey (JSS), the staff is taken care of by getting a better understanding of their everyday life and work attitude. Job satisfaction is considered a constant, as it tends to remain stable throughout time said [8]. Paul Spector's Job Satisfaction Survey by [9] is among the most widely used job satisfaction tools, it is a suitable multi-dimensional tool to measure globally in various work environments, and its psychometric properties have been extensively studied in [10-12]. [13] found that the JSS was one of seven tools that matched the specified and validity criteria.

Several studies in [7,14-16] examined job satisfaction in Polytechnic Malaysia. [14] highlighted service quality and organizational commitment are found to be fully mediated by job satisfaction. A similar relationship exists between job satisfaction and organizational performance sustainability. The findings of [15] indicate reputation does not affect job satisfaction. The findings highlight the importance of service providers' capacity to correctly execute non-academic, academic, program issue, and access factors in improving employee satisfaction. [16] found in comparison to promotions, only recognitions show a substantial correlation with job satisfaction among academic staff at Polytechnic Sarawak, which includes Polytechnic Kuching Sarawak (PKS), Polytechnic Mukah Sarawak (PMU), and Polytechnic Metro Betong (PMB) (PMB). The study by [7] indicates Job satisfaction has a significant and favorable effect on employee performance for Polytechnic employees, particularly those in the Department of Tourism and Hospitality.

Much research has also been undertaken on the elements that influence job satisfaction. Much research has been carried out to account for the elements that influence job satisfaction. Working environments, job security, autonomy or freedom, interaction with coworkers, relationship with superiors, promotion, and pay were identified as the main factors influencing job satisfaction of non-academic workers at the University of Kelaniya in Sri Lanka [17]. Working environments, pay, relationships with superiors, and relationships with coworkers were the most important elements influencing total job satisfaction. The findings in [18] demonstrate that job satisfaction is influenced by money or salary, job security, supervision, promotion opportunities, and job challenges. Additionally, it demonstrates that job satisfaction has a strong positive impact on both affective and continuous commitment. Job satisfaction, on the other hand, has a stronger impact on continued commitment. The study reveals that job

satisfaction is significant for organizational commitment among tertiary institution non-academic staff. The findings in [19] indicate that several positive responses about job satisfaction relate to the social capital index. While assessing the aspects affecting job satisfaction, employees rated their coworkers' relationships and company communication positively, as well as their job loyalty and stability. The incentive and payment systems currently in place were found to be negative. According to the findings of [20], job satisfaction and organizational commitment have moderate mean values. Between job satisfaction components, demographic characteristics, and organizational commitment, a moderately significant positive association was discovered. Significant factors of organizational commitment included supervision, pay, overall job satisfaction, age, and job tenure. Employees were significantly unsatisfied, as stated in [21]. Except for working conditions, supervision, and organizational policies and practices, there were no significant differences in satisfaction between employees of the regional education bureau and woreda education offices based on organizational location. This finding also suggested that employees of woreda education offices were more dissatisfied with working conditions and supervision, whereas employees of the education bureau were more dissatisfied with organizational policies and practices. Additionally, the study found that participants' work experience and educational level did not affect their overall contentment. However, there was a considerable difference in satisfaction with advancement in terms of work experience. The findings revealed that zone administrators should consider aspects affecting employee satisfaction with job placement, progress, and promotion as well. According to the study results by [22], the intrinsic factors, such as job satisfaction and promotion opportunities, were found to be more important than the extrinsic factors, such as pay and coworkers. This study also indicates the leaders' behaviors that influence turnover intention reflect both paternalistic and transformational leadership styles. Organizational communication, pay, and employee rewards were found to have a significant impact on job satisfaction in a study published in [23]. The study suggested a review and revision of the institution's current communication strategy and policy are required to make it more inclusive and ensure that official communication is disseminated. According to [24], the chance for growth is the strongest predictor of job satisfaction, followed by the nature of work, meaningful work, and recognition for accomplishment. According to [25], various factors influence job satisfaction among academicians, including the work environment, the work balance, and family life. Additionally, the workers rated themselves as above-average performers at work. However, it is discovered that there is no correlation between workload and performance, suggesting that any weaknesses, if any, have been substituted by the organization's other benefits.

From the above literature, the Job Satisfaction index based on nine subscales JSS using Spector both academic and non-academic has not yet been validated in the Polytechnic Kuching Sarawak context. Hence, valid tools adapted are needed to obtain the level of Job Satisfaction Index in Polytechnic Kuching Sarawak for both academic and non-academic employees.

3. RESEARCH DESIGN AND METHODOLOGY

This study used a quantitative approach by collecting data using a survey method. The survey was distributed to 482 staff of Polytechnic Kuching Sarawak via a Google form link to accelerate data collection. 218 staff had answered the survey. Based on [26], the sampling number was appropriate. The survey question has two parts. The first part is on the demography information which contains 8 questions, and the second part is the job satisfaction

questionnaires. The demography questions include the category of employment, gender, highest education level, age, grade of employment, marital status, household income, and length of service as shown in Table 1.

Table 1: Frequency and percentage distribution of respondents by demographic profile

Questions	Variable
Category of employment	Academic
	Non-academic
Gender	Male
	Female
Highest education level	PMR or lower
	SPM
	STPM
	CERTIFICATE
	Diploma
	Bachelor's degree
	Master's degree
	Doctorate degree
Age	<20years
	21-30 years
	31-40 years
	41-50 years
	>51 years
Grade of employment	Grade 48-52
	Grade 41-44
	Grade 17-40
	Grade 1-16
Marital Status	Married
	Single
	Divorced
Household income	Less than RM4850
	RM4851 – RM10,970
	RM10,971 and more
Length of Service	<1 year
	1-3 years
	3-6 years
	6-9 years
	9-12 years
	12-15 years
	>15 years

The questions in the first part were adapted from the Job Satisfaction Survey (JSS) produced by Paul Spector in [5]. It has 36 item questions with a 6 Likert scale score ranging

from ‘1 – Disagree very much’, ‘2 - Disagree moderately’, ‘3 - Disagree slightly’, ‘4 - Agree slightly’, ‘5 – Agree moderately’ and ‘6 - Agree very much’. These items are divided into nine subscales: pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, and communication. where each facet contained 4 items. The subscales and the item numbers belonging to the subscales are presented in Table 2.

Table 2: Subscales and item numbers

Subscale	Item numbers
Pay	1, 10, 19, 28
Promotion	2, 11, 20, 33
Supervision	3, 12, 21, 30
Fringe benefits	4, 13, 22, 29
Contingent reward	5, 14, 23, 32
Operating conditions	6, 15, 24, 31
Coworkers	7, 16, 24, 34
Nature of work	8, 17, 27, 35
Communication	9, 18, 26, 36

A pilot test to obtain the reliability coefficient has been done earlier by using Cronbach’s Alpha test and the coefficient alpha value of the total item was 0.91 in [27]. Out of 36 questions, 19 items are negatively worded on purpose which are item 2, 4, 6, 8, 10, 12, 14, 16, 18, 19, 21, 23, 24, 26, 29, 31, 32, 34 and 36. Since higher Likert scales represent job satisfaction, hence the negatively worded item must be reverse scored such as in Table 3 before being analyzed. Descriptive analysis using Statistical Package for Social Science (SPSS) version 26 software was performed to obtain the mean score of each subscale, the sum score for each subscale, and the total item score for 36 items. All analysis of study data will be displayed in tabular form that includes mean, percentage, and frequency values.

Table 3: Reversed score for the negatively worded item

Original score	1	2	3	4	5	6
Reversed score	6	5	4	3	2	1

The mean score for each subscale can be interpreted such as in Table 4 where the mean score is more or equal to 4, between 3 and 4, and less or equal than 3 can be interpreted as satisfaction, ambivalence, and dissatisfaction, respectively.

Table 4: Mean scores interpretation

Mean score	Interpretation
≥ 4	Satisfaction
3 – 4	Ambivalence
≤ 3	Dissatisfaction

The total score for each subscale and the total item score range from 4-24 and 36-216, respectively. Table 5 and Table 6 show the interpretation of the total sum score for each

subscale and the total item score for all items. These tables show that higher scores can be interpreted as job satisfaction.

Table 5: The total sum score interpretation for each subscale

Sum score	Interpretation
4 - 12	Dissatisfaction
12 - 16	Ambivalence
16 -24	Satisfaction

Table 6: The total item sum score interpretation

Sum score	Interpretation
36 -108	Dissatisfaction
108 - 144	Ambivalence
144 -216	Satisfaction

4. RESULTS AND DISCUSSION

The frequency and percentage of respondents by demographic profile are shown in Table 8. Table 8 shows the frequency of each variable based on respondent feedback for each demographic question.

A total of 178 respondents (81.7%) were in an academic category while 40 respondents (18.3%) were non-academic category. About 95 respondents (43.6%) while are male and 123 respondents (56.4%) are female. The majority education level of respondents was a Bachelor's degree level with 92 respondents (42.2%) while the minority education level of respondents was certificate and PMR or lower level with 1 respondent (0.5%) each. The number of respondents was mostly under ages 41 to 50 years old with 104 respondents (47.7%) and the employment group of Grade 41-44 with 131 respondents (60.1%). A total of 187 respondents (8%) are married while 20 respondents (9.2%) are single, and 11 respondents (5%) are divorced.

Furthermore, 136 respondents (62.4%) were in the M40 category (Household income: RM4851 - RM10,970), 50 respondents (22.9%) were in the T20 category (Household income: RM10,971 and more), and only 32 respondents (14.7%) were in the B40 category (Household income: less than RM4850). The result of the study showed that 61 respondents (28%) have a length of service of more than 15 years, followed by 45 respondents (20.6%) with a length of service of 12 to 15 years, 44 respondents (20.2%) have a length of services 1 to 3 years, 27 respondents (12.4%) have a length of services 9 to 12 years, 16 respondents (7.3%) have a length of services 6 to 9 years and 3 to 6 years, and 9 respondents (4.1%) is lowest respondents with a length of services less than 1 year.

Table 8: Frequency and percentage distribution of respondents by demographic profile

Variables		Frequency	Percent (%)
Category of Employment	Academic	178	81.7
	Non-academic	40	18.3
Gender	Male	95	43.6
	Female	123	56.4
Highest Education Level	PMR or lower	1	0.5
	SPM	16	7.3
	STPM	5	2.3
	CERTIFICATE	1	0.5
	Diploma	6	2.8
	Bachelor Degree	92	42.2
	Master Degree	90	41.3
	Doctorate Degree	7	3.2
Age	<20years	1	0.5
	21-30 years	6	2.8
	31-40 years	97	44.5
	41-50 years	104	47.7
	>51 years	10	4.6
Grade of Employment	Grade 48-52	53	24.3
	Grade 41-44	131	60.1
	Grade 17-40	29	13.3
	Grade 1-16	5	2.3
Marital Status	Married	187	85.8
	Single	20	9.2
	Divorced	11	5.0
Household Income	less than RM4850	32	14.7
	RM4851 - RM10,970	136	62.4
	RM10,971 and more	50	22.9
Length of Service	<1 year	9	4.1
	1 - 3 years	44	20.2
	3 - 6 years	16	7.3
	6 - 9 years	16	7.3
	9 - 12 years	27	12.4
	12 - 15 years	45	20.6
	>15 years	61	28.0

Figure 1 shows the mean score for job satisfaction index subscales. The mean score results for all subscales in a range of 3.0264 to 4.7695.

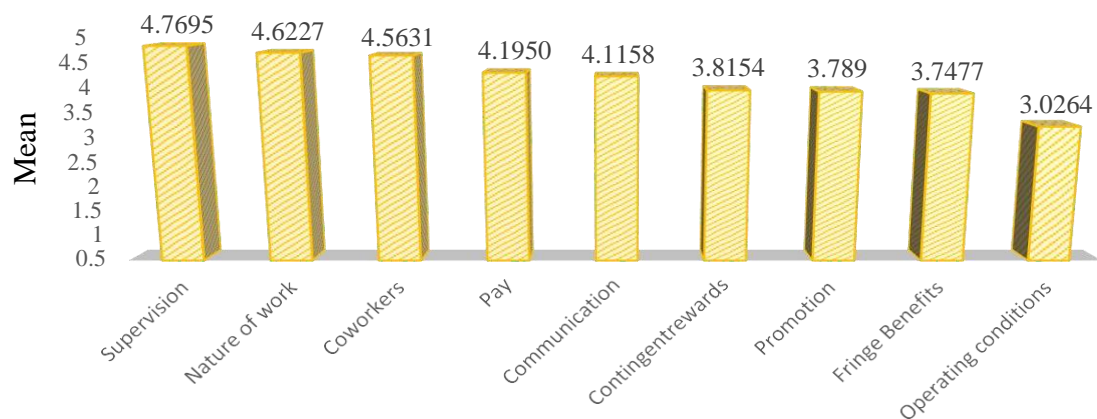


Figure 1: Job satisfaction index subscale

The result reveals that supervision is the highest mean score (4.7695) among other subscales, followed by nature of work (4.6227), coworkers (4.5631), pay (4.195), communication (4.1158), contingent rewards (3.8154), promotion (3.789), fringe benefits (3.7477), and the lowest mean score were operating conditions (3.0264).

Table 9: Respondent's level of job satisfaction

Subscales	Mean	Std. Deviation	Interpretation
Supervision	4.7695	0.92608	Satisfaction
Nature of work	4.6227	0.93918	Satisfaction
Coworkers	4.5631	0.79368	Satisfaction
Pay	4.1950	0.98920	Satisfaction
Communication	4.1158	0.95495	Satisfaction
Contingent rewards	3.8154	1.03928	Ambivalence
Promotion	3.7890	0.98472	Ambivalence
Fringe Benefits	3.7477	1.01259	Ambivalence
Operating conditions	3.0264	0.86878	Ambivalence

The Paul Spector in [28] interpretation satisfaction score is used to analyze the mean score of the job satisfaction index in this study. Table 9 depicted the level of job satisfaction of the respondents by examining the mean and standard deviation of different subscales of job satisfaction. Based on the result in Table 9 indicates that employees of Polytechnic Kuching Sarawak were satisfied in five subscales, which are supervision, nature of work, coworkers, pay, and communication. While they were in the state of having mixed feelings about contingent rewards, promotion, fringe benefits, and operating conditions subscales.

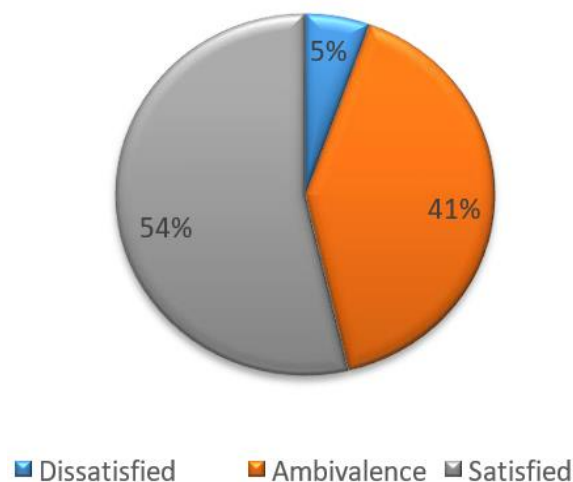


Figure 2: All item total score for each satisfaction level

All item-total scores for each satisfaction level are depicted in Figure 2. The satisfaction interpretation and total for all item-total scores are shown in Table 10. The satisfaction interpretation for all item-total scores ranging from 36 to 108 was interpreted as dissatisfied, while the score between 108 to 144 was interpreted as ambivalence. The score ranging from 144 to 216 were interpreted as dissatisfied. From Table 10, most of the respondents (54%) were satisfied, followed by ambivalence (41%), and lastly dissatisfied (5%).

Although the percentage of dissatisfaction seems to be very low, it can't be neglected by employers. Employees who are dissatisfied with their jobs are more likely to be absent, do less work than their happier counterparts, arrive late to work, and resign, all of which can have a detrimental impact on the company's morale [29-32]. According to [33,34], job satisfaction is a pleasant emotional state that results from achieving one's job values, whereas job dissatisfaction is an unpleasant emotional state that results from frustration in achieving one's job ideals.

Table 10: Satisfaction interpretation and total for all item total score

All Item Total Score	Interpretation	Total	Percent (%)
36-108	Dissatisfaction	12	5%
Between 108-144	Ambivalence	89	41%
144-216	Satisfaction	117	54%

4.1 Supervision Subscale

According to the empirical findings, the supervision subscales had the highest mean score of any subscale in job satisfaction. The supervision subscale was examined through four items whereas the mean score of all four items were ranging from 4.3303 to 5.0138 as depicted in Figure 3. The highest mean score was achieved by item B3 (My supervisor is quite competent in doing his/her job), 5.0138. While the lowest mean score was achieved by item B21 (My supervisor shows too little interest in the feelings of subordinates), 4.3303.

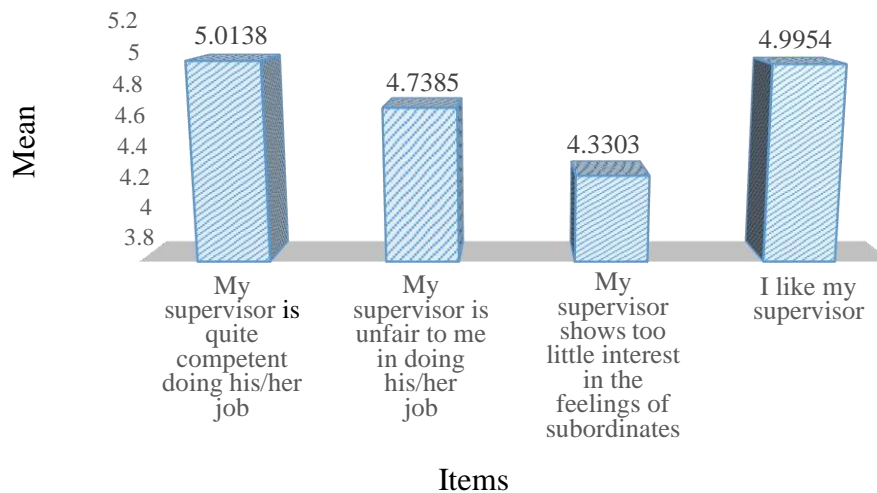


Figure 3: Mean score of supervision subscale item

Table 11 shows the mean score and satisfaction interpretation for the supervision subscale item. From Table 11, the results indicated that all employees of Polytechnic Kuching Sarawak were satisfied with the supervision had in the institution. Employees agreed that their supervisor is quite competent in doing his/her job. They also agreed that their supervisor was being fair to them, and their supervisor also show enough interest in the feelings of subordinates. Meanwhile, this study also found that employees are like their supervisors.

Table 11: Mean score and satisfaction interpretation for supervision subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B3	My supervisor is quite competent in doing his/her job	5.0138	0.95753	Satisfaction
B12	My supervisor is unfair to me	4.7385	1.34763	Satisfaction
B21	My supervisor shows too little interest in the feelings of subordinates	4.3303	1.42107	Satisfaction
B30	I like my supervisor	4.9954	0.99537	Satisfaction

The satisfaction interpretation and total summed supervision subscale item score are shown in Table 12. Most respondents were satisfied with their supervisor (83%) and only 3% of them were dissatisfied with their supervisor. While only 14% of them had mixed feelings (ambivalence) towards their supervisors.

Table 12: Satisfaction interpretation and total summed supervision subscale item score

Summed Supervision Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	7	3%
Between 12-16	Ambivalence	30	14%
16-24	Satisfied	181	83%

This supervision subscale was focused primarily on the direct supervisor of the employees. According to [35,36], there is a correlation between administrators' activities and the job satisfaction of teachers under their supervision, including the working environment they produce.

Some research found that employees believe managers have a beneficial or negative impact on the stress they endure [37-39]. This is in line with one study that found that employees that do not receive assistance from their boss are more anxious and dissatisfied as a result [40]. Several studies have found that supervisor support influences employee job satisfaction [41-46].

4.2 Nature of Work Subscale

The second highest mean score of job satisfaction index subscales was the nature of work. The highest mean score item was item B27 (I feel a sense of pride in doing my job), 4.9404, and the lowest mean score item was item B8 (I sometimes feel my job is meaningful- reversed), 3.9817.

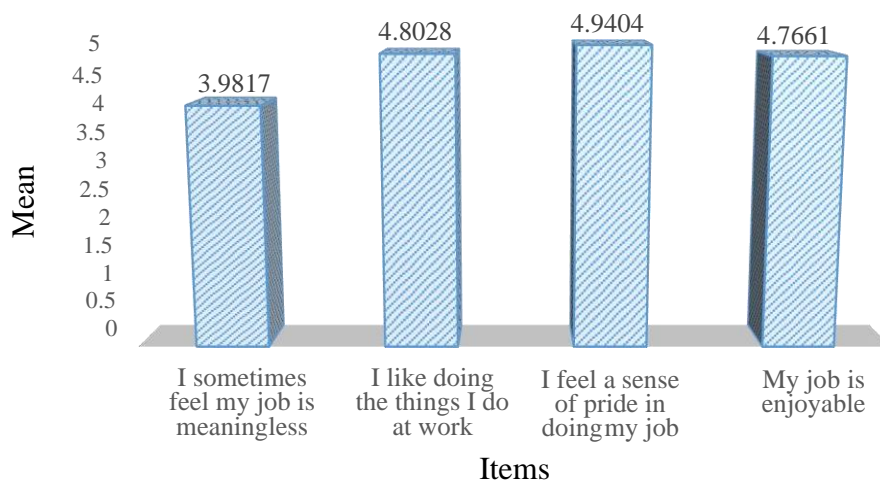


Figure 4: Mean score for nature of work subscale item

Four items were used to examine the nature of work subscale. The result found that employees were satisfied with three items asked (B17, B27, B35) and they were only dissatisfied with one item (B8) as shown in Table 13. Furthermore, the employees were found to like doing the things they do at work. Employees also feel a sense of pride in doing their job and they also feel their job is enjoyable.

Table 13: Mean score and satisfaction interpretation for nature of work subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B8	I sometimes feel my job is meaningless	3.9817	1.49643	Ambivalence
B17	I like doing the things I do at work	4.8028	1.08725	Satisfaction
B27	I feel a sense of pride in doing my job	4.9404	1.03002	Satisfaction

B35	My job is enjoyable	4.7661	1.13809	Satisfaction
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Table 14 shows the result of satisfaction interpretation and the total summed nature of work subscale item score. From Table 14 below, 81% of employees were satisfied with the nature of work happening in Polytechnic Kuching Sarawak. While there are 15% of them are feel mixed feelings (ambivalence) towards the nature of work. There are only 5% of employees were dissatisfied with the nature of work in Polytechnic Kuching Sarawak.

Table 14: Satisfaction interpretation and total summed nature of work subscale item score

Summed Nature of Work Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	10	5%
Between 12-16	Ambivalence	32	15%
16-24	Satisfied	176	81%

According to [47,48], motivational factors (the nature of work, the sense of achievement from their work, the recognition, the responsibility that is given to them, and opportunities for personal growth and advancement) help employees find their worth in the value given to them by the organization. Furthermore, this can increase employee motivation, which leads to increased internal contentment, which leads to satisfaction.

4.3 Coworkers Subscale

Another subscale examined in this study was coworkers. This subscale described the people with whom the person works. Employees were tested with 4 items and the mean score were shown in Figure 5 below. This study found that the highest mean score was 5.0734 for item B25 (I enjoy my coworkers). Meanwhile, item B7 (I like the people I work with) had a 5.0275 mean score. The lowest mean score was recorded by item B16 (I find I have to work harder at my job because of the incompetence of people I work with), which is only a 3.6009 mean score.

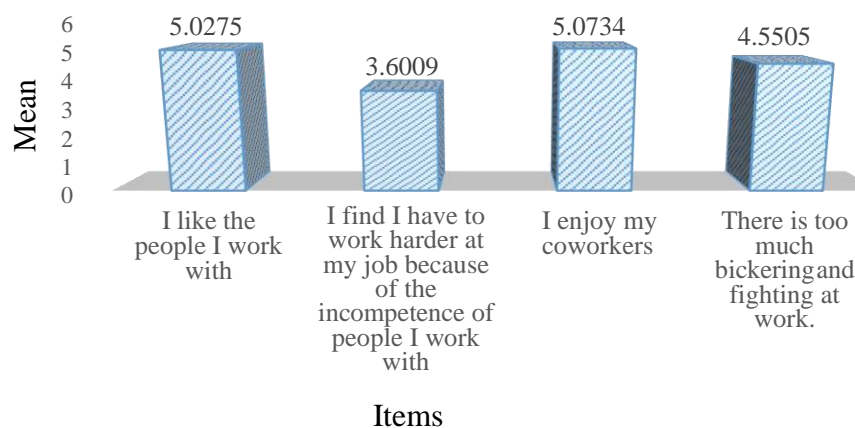


Figure 5: Mean score of coworkers subscale item

The mean score and satisfaction interpretation for coworkers subscale items are shown in Table 14 below. From Table 14, it was found that employees of Polytechnic Kuching Sarawak had mixed feelings (ambivalence) of they had to work harder at their job because of the incompetence of the people they work with (B16). Its shows that employees were not sure of

their feeling about this item. Meanwhile, employees seem like the people they work with, they also enjoy their coworkers, and they satisfy that there are not much bickering and fighting at work.

Table 14: Mean score and satisfaction interpretation for coworkers subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B7	I like the people I work with	5.0275	0.88467	Satisfaction
B16	I find I have to work harder at my job because of the incompetence of the people I work with	3.6009	1.42764	Ambivalence
B25	I enjoy my coworkers	5.0734	0.94265	Satisfaction
B34	There is too much bickering and fighting at work.	4.5505	1.32322	Satisfaction

Table 15 shows the satisfaction interpretation and total summed coworkers subscale item score. The result reveals that the total score of the coworker's subscale shows that 78% of employees were satisfied with this coworkers subscale as shown in Table 15. While 19% of them were ambivalence which is maybe sometimes, they feel satisfied with their coworkers, but sometimes they were not. Lastly, there are 2% of them are dissatisfied with the coworker's subscale.

Table 15: Satisfaction interpretation and total summed coworkers subscale item score

Summed Coworkers Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	5	2%
Between 12-16	Ambivalence	42	19%
16-24	Satisfied	171	78%

4.4 Pay subscale

Pay subscale was examined through four items is the mean score of all items were ranging from 4.9037 to 3.3119 as depicted in Figure 6. Based on the empirical findings gathered, the result indicated that the highest mean was achieved by item B1 (I feel I am being paid a fair amount for the work I do), 4.9037. While the lowest mean was achieved by item B10 (Raises are too few and far between-negatively words), 3.3119.

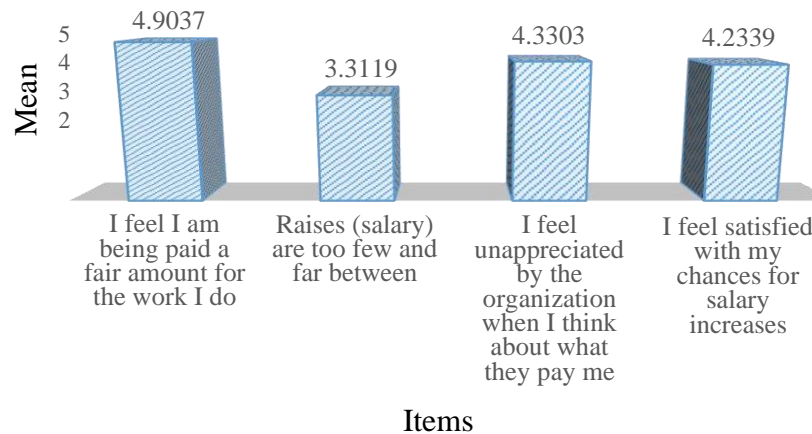


Figure 6: Mean score of pay subscale item

Table 16 shows the results of the mean score and satisfaction interpretation for the pay subscale item. From Table 16, the results indicated that all employees of Polytechnic Kuching Sarawak were generally satisfied with pay from the institution. Employees were satisfied with the amount of their pay. They are also satisfied with the appreciation that they get from the organization if referring to the pay that they get. Besides, this study also found that employees had mixed feelings (ambivalence) about the amount of salary increment.

Table 16: Mean score and satisfaction interpretation for pay subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B1	I feel I am being paid a fair amount for the work I do	4.9037	1.09245	Satisfaction
B10	Raises (salary) are too few and far between	3.3119	1.59606	Ambivalence
B19	I feel unappreciated by the organization when I think about what they pay me	4.3303	1.31671	Satisfaction
B28	I feel satisfied with my chances of salary increases	4.2339	1.32517	Satisfaction

Table 17 shows the results of satisfaction interpretation and total summed pay item score. From Table 17, most of the respondents were satisfied with the pay they get (61%), and 13% of them were dissatisfied with what they get. While there are 27% of them were have a mixed feeling (Ambivalence) towards the pay they get.

Table 17: Satisfaction interpretation and total summed of pay item score

Summed Pay Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	28	13%
Between 12-16	Ambivalence	58	27%
16-24	Satisfied	132	61%

From the result obtained, the employees are satisfied with the pay increase they have received. They also agreed that their pay is significantly higher than the comparable companies. As a result, the respondents agreed that the pay they were paid was a major role in their decision to remain with the institution. As mentioned by [7,49], employees will evaluate their work happiness by comparing their pay to their efforts.

However, according to [50], pay isn't the sole element that influences job performance. He also said that many businesses do a poor job of linking remuneration to performance. Even though numerous studies have shown a favorable association between remuneration and performance as a motivator or extrinsic factor, this is not the case in the study by [51].

4.5 Communication Subscale

The communication subscale was described as how well employees are kept informed. Employees were tested with 4 items and the mean score of the communication subscale item were shown in Figure 7 below. This study found that the highest mean score was 4.633 for item B9 (Communications seem good within this organization). Meanwhile, item B18 (The goals of this organization are not clear to me) had a 4.1743 mean score. Two items that obtained the low mean score which is item B26 and B36. From the analysis, the mean score of item B26 (I often feel that I do not know what is going on with the organization-negatively worded) was 3.9495. While the item of B36 (Work assignments are not fully explained-negatively worded) was a 3.7064 mean score.

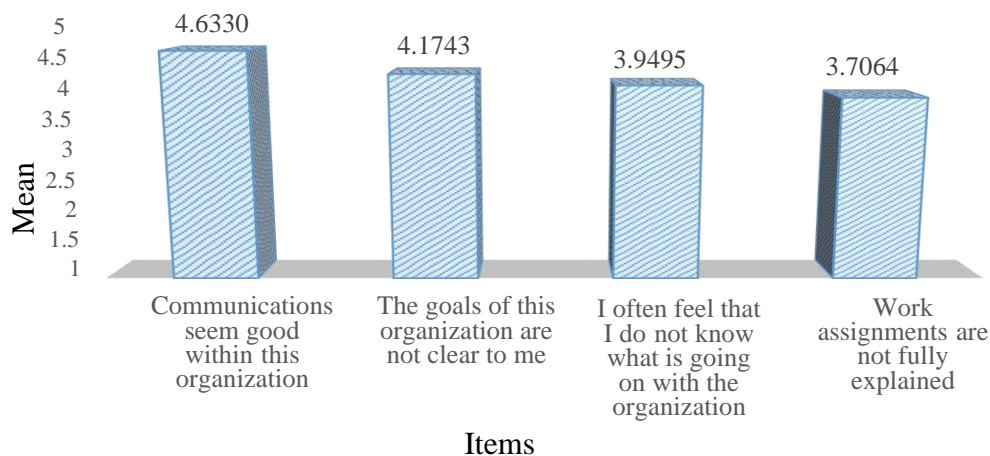


Figure 7: Mean score of communication subscale item

Table 18 shows the results of the mean score and satisfaction interpretation for the communication subscale item. Four items were used to examine this communication subscale and it is found that employees were satisfied with only two items asked which are B9 (Communications seem good within this organization) and B18 (The goals of this organization are not clear to me). Besides, employees also feel ambivalence about the others two items which are B26 (I often feel that I do not know what is going on with the organization) and B36 (Work assignments are not fully explained).

Table 18: Mean score and satisfaction interpretation for communication subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B9	Communications seem good within this organization	4.6330	1.11265	Satisfaction
B18	The goals of this organization are not clear to me	4.1743	1.37686	Satisfaction
B26	I often feel that I do not know what is going on with the organization	3.9495	1.39856	Ambivalence
B36	Work assignments are not fully explained	3.7064	1.29730	Ambivalence

Table 19 shows the sum score of the communication subscale. It is found that 61% of employees were satisfied with communication in Polytechnic Kuching Sarawak. While there are 25% of them feel mixed feelings (ambivalence) towards communication in the institution. Lastly, there are only 14% of employees were dissatisfied with communication in Polytechnic Kuching Sarawak.

Table 19: Satisfaction interpretation and total summed communication subscale item score

Summed Communication Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	31	14%
Between 12-16	Ambivalence	54	25%
16-24	Satisfied	133	61%

According to [52], managers must communicate with coworkers, employees, faculty members, and other support people to help organizations achieve their objectives. According to [53], having a positive relationship between managers and employees can help to create a healthy work environment and reduce the likelihood of leaving the company. Thus, employee communications must do more than simply convey management's direction and directives throughout an organization. Effective communication leads to a successful organization.

4.6 Contingent Rewards Subscale

A contingent reward system is a motivational system that rewards individuals who achieve their goals. It provides positive reinforcement for a job well done. This type of reinforcement encourages employees to complete their tasks and meet their goals in a professional and timely manner. Unlike annual performance evaluations and reviews, the contingent reward system allows for more frequent assessments of an employee's work and, when appropriate, awards.

Figure 8 shows the results of the mean score of the contingent reward subscale item. This subscale was examined through four items. The mean score of all items were ranging from 4.1972 to 3.6147. Based on the empirical findings gathered, the result indicated that the highest mean was achieved by item B5 (When I do a good job, I receive the recognition for it that I should receive), 4.1972. While the lowest mean was achieved by item B23 (There are few rewards for those who work here), 3.6147.

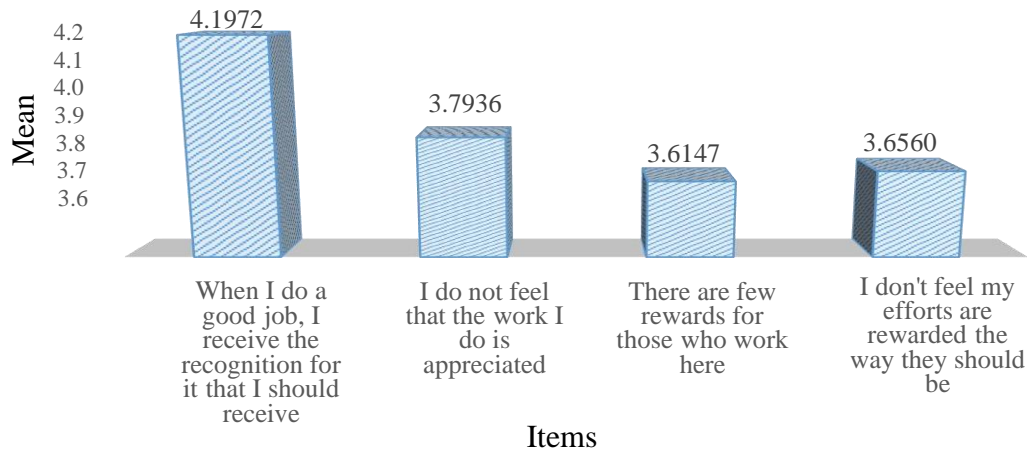


Figure 8: Mean score of contingent reward subscale item

Table 20 shows the results of the mean score and satisfaction interpretation for the contingent rewards subscale item. From Table 4, it is found that employees had much ambivalence feeling toward the contingent reward in the institution. This result clearly showed that employees were not sure of their feeling, whether satisfied or not on appreciation of the work they do and the rewards are given to employees who work in this institution. Employees also found not sure about the reward they should get for their efforts. Meanwhile, employees also found satisfaction in the recognition they should receive when they do a good job.

Table 20: Mean score and satisfaction interpretation for contingent rewards subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B5	When I do a good job, I receive the recognition for it that I should receive	4.1972	1.23788	Satisfaction
B14	I do not feel that the work I do is appreciated	3.7936	1.46811	Ambivalence
B23	There are few rewards for those who work here	3.6147	1.45854	Ambivalence
B32	I don't feel my efforts are rewarded the way they should be	3.6560	1.40309	Ambivalence

Table 21 shows the results of satisfaction interpretation and total summed contingent rewards subscale item score. From Table 21, it is found that less than half of employees were satisfied with the contingent rewards given in the institution (48%) and 23% of them was dissatisfied with the contingent rewards given to them. While there are 29% of them have mixed feelings towards the contingent rewards they get.

Table 21: Satisfaction interpretation and total summed contingent rewards subscale item score

Summed Contingent rewards Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	50	23%
Between 12-16	Ambivalence	63	29%
16-24	Satisfied	105	48%

According to Paul Spector in [5,48], most businesses overlook their organization's working environment, which has a negative impact on employee performance. According to him, the working environment consists of employee safety, job security, excellent connections with coworkers, recognition for good performance, an incentive for doing well, and involvement in the firm's decision-making process. He went on to say that if employees understand how important they are to the company, they will be more committed and have a sense of ownership.

4.7 Promotion Subscale

Promotion incentives, as a key psychological contract, may help employers not only choose talent but also increase employee passion for serving the company. Paul Spector in [54] through his Job Satisfaction Survey (JSS) has included this promotion as one of the indicators to measure the job satisfaction index of the employees. Hereby, this promotion subscale was examined and the mean score of each item was analyzed. Figure 9 shows the mean score for each item of the promotion subscale. The highest mean score was from item B11 (Those who do well on the job stand a fair chance of being promoted), 4.0183. While the lowest mean score is from item B2 (There is too little chance for promotion on my job-negatively worded).

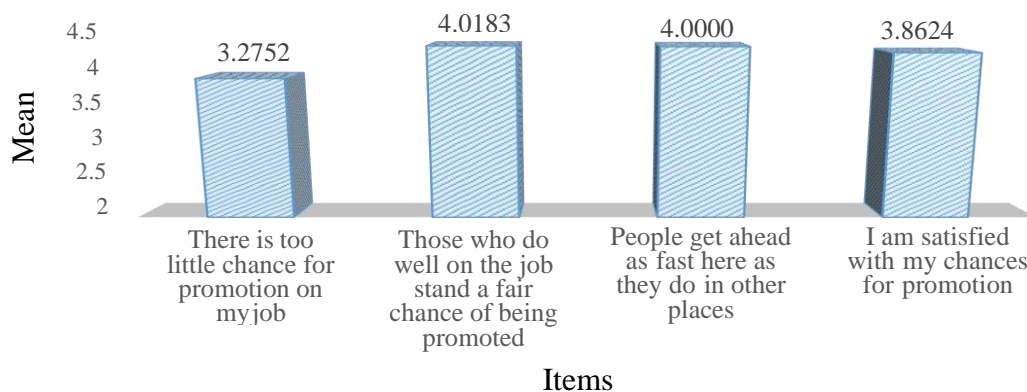


Figure 9: Mean score of promotion subscale item

Table 22 shows the results of the mean score and satisfaction interpretation for the promotion subscale item. From Table 22, it is found that employees had ambivalence feeling toward the promotion in the institution equally to satisfaction feeling. This result clearly showed that employees were not sure of their feeling about their chances of job promotion and their satisfaction with their chance of job promotion. Meanwhile, employees were found satisfied with the chance of promotion for those who do well, and they were also satisfied with opportunities to get ahead as fast as they do in other places.

Table 22: Mean score and satisfaction interpretation for promotion subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B2	There is too little chance for promotion in my job	3.2752	1.45515	Ambivalence
B11	Those who do well on the job stand a fair chance of being promoted	4.0183	1.48095	Satisfaction
B20	People get ahead as fast here as they do in other places	4.0000	1.24434	Satisfaction
B33	I am satisfied with my chances of promotion	3.8624	1.43984	Ambivalence

Table 23 shows the results of Satisfaction Interpretation and Total Summed Promotion Subscale Item Score. From Table 23, only 46% of employees were satisfied with the promotion in Polytechnic Kuching Sarawak. There is a quite high percentage of them are feel mixed feelings towards the promotion in this institution which is 32%. Meanwhile, there are 22% of employees were dissatisfied with the nature of work in Polytechnic Kuching Sarawak.

Table 23: Satisfaction interpretation and total summed promotion subscale item score

Summed Promotion Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	48	22%
Between 12-16	Ambivalence	70	32%
16-24	Satisfied	100	46%

According to [55], a promotion incentive is more successful than a wage or equity incentive in motivating personnel. In the research on the correlation between promotion incentives and bank performance, Lazear and Rosen's championship theory in [56] has long had a prominent place. It achieves the incentive effect by comparing agent performance and rewarding those who perform well while penalizing those who perform poorly. According to some Chinese researchers, the effect of promotion incentives causes top executives to increase firm performance through mergers and acquisitions, reduced job consumption, and other methods based on the championship theory.

Using panel data from China's listed commercial banks over five years, [57] investigated the impact of promotion incentives on the performance of Banks with various property rights and discovered that promotion incentives have a significant positive effect on the performance of state-owned Banks. The tournament theory's inverse is the behavior theory.

4.8 Fringe Benefits Subscale

Employees receive fringe benefits in addition to their stated compensation for performing a specific function. Some benefits, such as social security and health insurance, are required by law, while others are provided voluntarily by the employer. Optional fringe benefits include free breakfast and lunch, gym membership, employee stock options, transportation perks, retirement planning services, childcare, and education assistance. Figure 9 shows the mean score for each item of the fringe benefits subscale item. From Figure 9, it is found that the highest mean score was 4.0963 for item B22 (The benefits package we have is equitable).

Meanwhile, the item asked (B13) (The benefits we receive are as good as most other organizations offer) had a 4.000 mean score. There are two items were got a low mean score which are B4 and B29. From the analysis, the mean score of item B4 (I am not satisfied with the benefits I receive -negatively worded) was 3.8394. While the item of B29 (There are benefits we do not have which we should have-negatively worded) was a 3.0550 mean score.

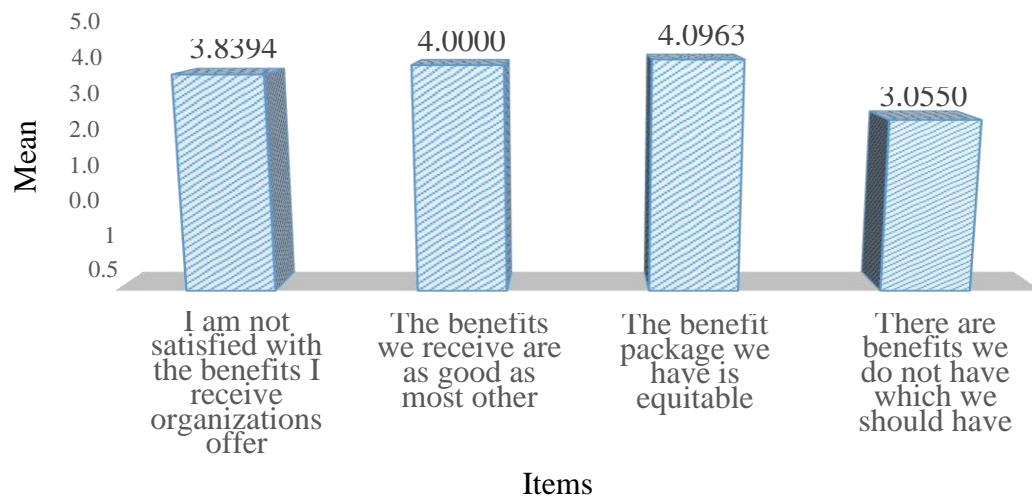


Figure 10: Mean score of fringe benefits subscale item

Table 24 shows the results of the mean score and satisfaction interpretation for the fringe benefits subscale item. From Table 24, it is found that employees had much ambivalence feeling toward the fringe benefits of the institution. This result clearly showed that employees were not sure of their feeling, whether satisfied or not with the fringe benefits provided by this institution. Employees are also found not sure about the benefits that they receive from the situation, and they are also not sure there are benefits they have that they should have.

Table 24: Mean score and satisfaction interpretation for fringe benefits subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B4	I am not satisfied with the benefits I receive	3.8394	1.43905	Ambivalence
B13	The benefits we receive are as good as most other organizations offer	4.0000	1.32679	Satisfaction
B22	The benefits package we have is equitable	4.0963	1.30044	Satisfaction
B29	There are benefits we do not have that we should have	3.0550	1.47066	Ambivalence

Table 25 shows the results of the satisfaction interpretation and total summed fringe benefits subscale item score. From Table 25, it is found that the highest percentage of respondents were satisfied with the fringe benefits they get from their employer (40%) and 24% of them were dissatisfied with the fringe benefits they get. While there are 35% of them were have mixed feelings about the fringe benefits, they get.

Table 25: Satisfaction interpretation and total summed fringe benefits subscale item score

Summed Fringe Benefits Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	53	24%
Between 12-16	Ambivalence	77	35%
16-24	Satisfied	88	40%

According to [58,59], supervision, working conditions, compensation factors, work itself, and recognition all contribute to job satisfaction among school personnel. School employees were satisfied with three elements, however, they showed a modest degree of recognition and salary, as well as incentives and benefits, as factors affecting their job satisfaction.

4.9 Operating Conditions Subscale

The policies and processes of any organization are critical. Policies and procedures complement one another to create a road map for day-to-day operations. They ensure that rules and regulations are followed, decisions are guided, and internal procedures are streamlined. This facet was not abandoned from the analysis of this study. By using 4 items of JSS, all the data have been analyzed and finally, it is found that this operating condition subscale has the lowest mean achievement among all nine subscales examined in this study.

Figure 11 shows that the mean score of the items in this operating condition subscale ranges from 3.8257 to 2.445. The highest mean score was recorded by item B15 (My efforts to do a good job are seldom blocked by red tape), 3.8257. While the lowest mean score was recorded by item B31 (I have too much paperwork), 2.445.

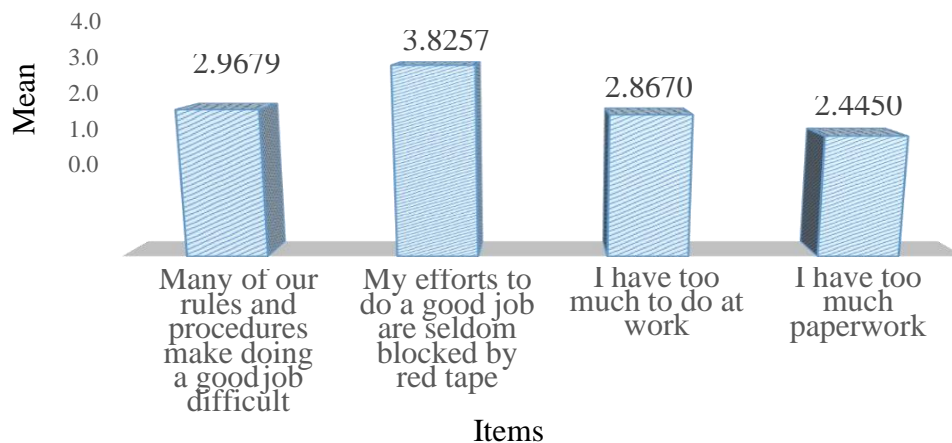


Figure 11: Mean of operating condition subscale item

Table 26 shows the results of the mean score and satisfaction interpretation for the operating conditions subscale item. From Table 25, it is found that employees were much more satisfied with this operating condition subscale. Employees are found dissatisfied with rules and procedures created by employers that make them difficult to do a good job. Furthermore, employees also felt dissatisfied with the quantity of work they must do. They are also dissatisfied with the amount of paperwork that has been given to them.

Table 26: Mean score and satisfaction interpretation for operating condition subscale item

Item	Statement	Mean	Standard Deviation	Interpretation
B6	Many of our rules and procedures make doing a good job difficult	2.9679	1.35900	Dissatisfaction
B15	My efforts to do a good job are seldom blocked by red tape	3.8257	1.43905	Ambivalence
B24	I have too much to do at work	2.8670	1.20892	Dissatisfaction
B31	I have too much paperwork	2.4450	1.25877	Dissatisfaction

Table 27 shows the results of the Satisfaction Interpretation and Total Summed Operating Condition Subscale Item Score. From Table 27, it is found that the majority (58%) of the employees were dissatisfied with the operating conditions implemented in this institution. There are only 12% of employees were satisfied with the operating condition in this institution and 30% of them were ambivalence. According to [36,60], school atmosphere, school administration, principal contacts with employees, and teacher and staff assistance in the execution of their jobs are all factors that go into operational conditions.

Table 27: Satisfaction interpretation and total summed operating condition subscale item score

Summed Operating Condition Subscale Item Score	Interpretation Score	Total	Percent (%)
4-12	Dissatisfied	126	58%
Between 12-16	Ambivalence	65	30%
16-24	Satisfied	27	12%

5. CONCLUSION

The primary objective is to identify the employee job satisfaction index among academic and non-academic staff in Polytechnic Kuching Sarawak. Firstly, the analysis shows that the employees were satisfied with supervision, nature of work, coworkers, pay, and communication facets in the institution. Unfortunately, there are four subscales were interpreted as ambivalence when the mean score of each subscale was between 3 to 4, which are contingent rewards, promotion, fringe benefits, and operating conditions. The result indicates that employees are most satisfied in these areas which are coworkers, people they work with, and supervisor is quite competent in doing his/her job. This parallel with finding from [19], employees rate their coworkers' relationship and supervision aspect of job satisfaction positively. Conversely, from the mean score of each item, it is found that the employees were dissatisfied with three items that come from the operational condition subscale. The three items are many of the institution's rules and procedures that make doing a good job difficult, having too much to do at work, and having too much paperwork. This finding is supported by [21] whereby the employees of the education bureau were more dissatisfied with organizational policies and practices.

There were a few limitations in this study that need to be considered. Firstly, since the result showed that employees are not satisfied with many institutions' rules and procedures, do much work at work, and have much paperwork, perhaps future studies can be enhanced to carry out the next future research and strengthen contributions to knowledge and institution's policy implementation. Secondly, this current research analysis is based on one-dimensional which is

in the form of traditional or item-descriptive analysis. Thus, paired sample test should be used to determine the difference in the job satisfaction index of academic and non-academic employees. Thirdly, this study does not consider an analysis of the relationship between the demographic profile variable with the job satisfaction index, perhaps in the future, it could include the correlation of the job satisfaction index with gender, age, marital status, and length of service in PKS.

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I-CReST 2022:113-090 - The Cyberbullying Behavior and The Emotional Effects Towards Social Media User in Malaysia

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Abstract

Social media use has become a part of our community lives especially among young generation. Its benefits include the ability to communicate with friends, quickly access information and gain a new knowledge, in addition through social media people also can stay in touch with adult mentors including parents, family members and teachers. However, excessive usage of social media can lead to cyberbullying issues. This will have an impact on a user's emotions, particularly for those who are engaged as influencers. The purpose of study is to identify cyberbullying behavior and its emotional effects towards social media user in Malaysia. A quantitative method is use to collecting data by distributing the questionnaire to 100 social media usage in Facebook, Twitter and Instagram. Purposive sampling used in the present study to obtain respondent number. The findings show the victims of cyberbullying can experience wide-ranging effects, including mental health issues, poor academic performance and effects on low self-confidence and even suicidal ideation. Because of the widespread use of social media, new avenues for online hostility have opened up. Cyber-bullying is linked to the amount of time peoples spend on social media, their problematic use, and their online conversations with strangers, all of which warrant public health action. The strongest and most constant risk is problematic usage of social media.

Keywords: Cyberbully behavior; emotional effects; media social; Malaysia

1. INTRODUCTION

Information and communication technologies are growing with the advent of various Internet-based applications. This new medium is not just a new medium for obtaining information to facilitate the distribution of information to a global audience, but also more than that. This media is also an influential tool for communication activities. Furthermore, with the development of web technology has shaped the use of the Internet has changed and so much can be done with this new media that Levinson (2009) calls it a "new media" newer than new media that shows a difference compared to classic new media such as email and websites [10]. This media is not only a tool for distribution, archiving and text-based facilities, but is now a tool for social media that has the ability to deliver media content and provide ease of interaction between readers and writing.

Since the beginning of 2005 social media has been seen to merge into a type of platform, which is social networking. Previously, social networking sites were often referred to with a broader 2.0 technological context. With a wide range of online social networks, many prefer to

use any of the available networking sites.[10] They can even use more than one social site depending on their main needs whether for communication, identity formation, or even social.

With the explosion of social media usage around the world, Malaysian Internet users are also affected. This modern communication technology allows people to deal online in various ways. Users are no longer limited to blogs, they also show high involvement in social networking activities such as photo sharing, microblogging, video uploads, and various other interactions with this new media. [10,11]

There is no doubt that social media provides many benefits to its users. Hence, in the spirit of the community using social media as a necessity of life, there are also some people who abuse it for personal gain, harm and discredit other individuals, commit cybercrime and play on the security issues of the people and the country. This act will have negative consequences, compromise self-integrity and be illegal. In addition, the statistics of cybercrime rates are also very alarming. In fact, it seems to pose a new threat to society.

Among the frequent threats in cybercrime involving social media is the crime of cyberbullying. Based on the United Nations Children's Fund (UNICEF) Report which shows Malaysia ranked second in Asia in 2020 for cyberbullying among youths, cyberbullying shows that cyberbullying is becoming more pronounced in the country. The purpose of study is to identify cyberbullying behavior and its emotional effects towards social media user in Malaysia. This study will examine the significant of cyberbully behavior towards emotional effect (Zhu et.al,2021) [9,10,11,16].

1.1 Research Objective

RO1: To Analyze the cyberbullying behavior towards social media user in Malaysia

RO2: To investigate the emotional effects towards victims of social media users in Malaysia.

2. LITERATURE REVIEW

2.1 Cyberbullying and Social Media

While contemporary resources like the Internet and social media may assist kids with research and assignment assistance, they have also provided bullies with a new forum. Cyberbullying, or bullying that occurs online or through electronic means, more than doubled between 2009 and 2011. Schools and bullying victims have particular difficulties as a result of cyberbullying because the victim can be made fun of at any time and from any location.

Cyberbullying is the practise of using computer means to ridicule, threaten, or taunt another student. These types of crimes include impersonating other people online, disseminating false information about other people, publishing private photographs or information without the victim's consent, tricking others into disclosing personal information, and sending threatening messages to other people. [15]

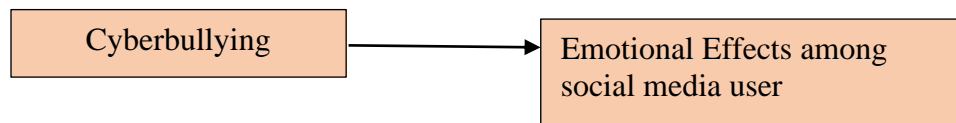
2.2 Effect of Cyberbullying

Cyberbullying can be extremely unpleasant for victims since it can reach them in their homes, which is typically where they feel the safest. Due to their constant access to social media and the Internet, victims of cyberbullying frequently feel as though they have no other option. Because of how ubiquitous and persistent it is, cyberbullying frequently leaves its victims depressed and with low self-esteem, which can affect their academic performance. Children who abruptly lose interest in activities they formerly loved or who no longer hang out with their best friends may also be victims of cyberbullying. In certain cases, persistent online bullying has caused victims to commit suicide.[9]

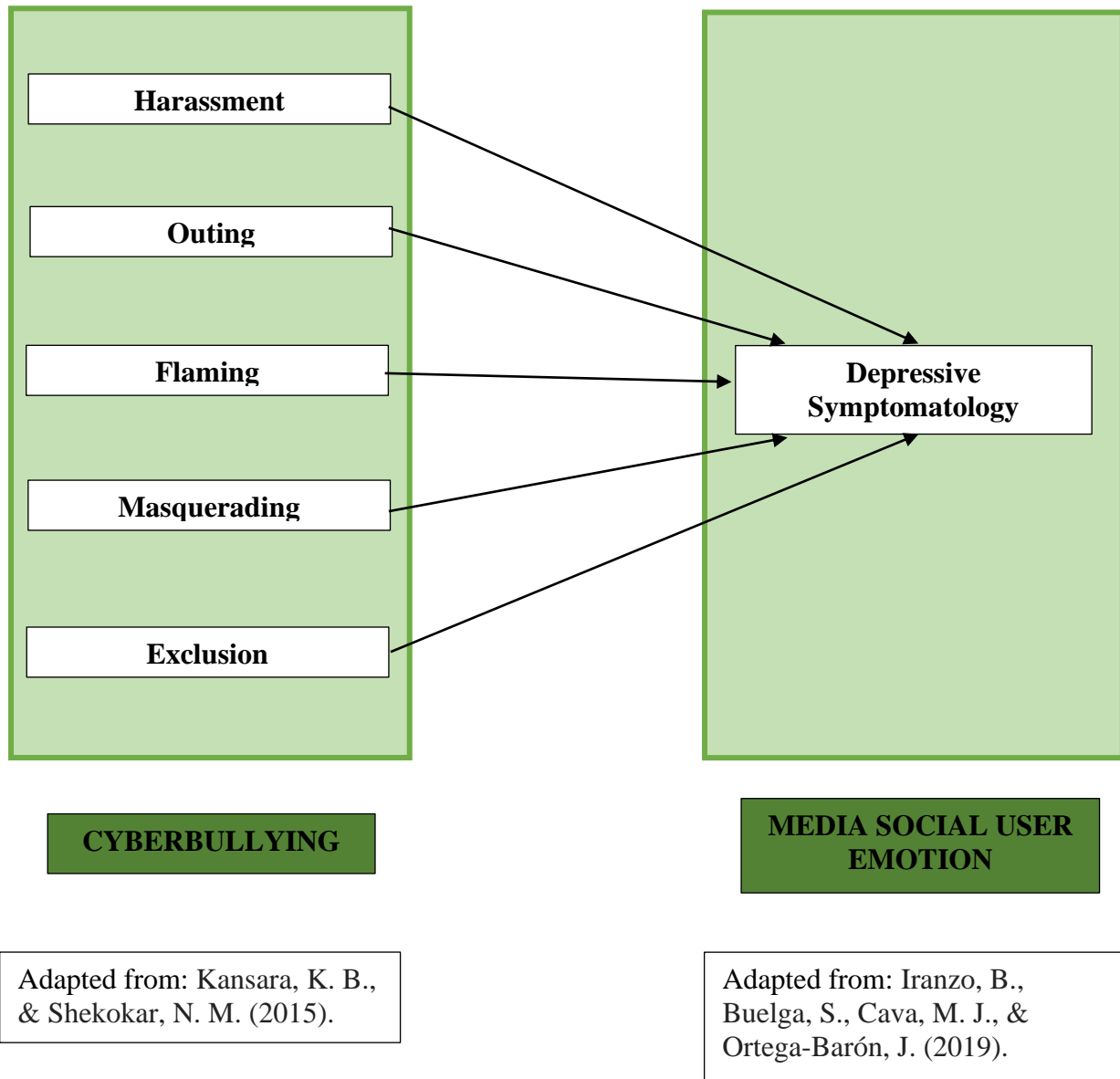
2.3 Cyberbullying and the Law

In this country, cyberbullying ought to be considered a major offence. Bullying victims are significantly more affected by cyberbullying than by physical bullying. The issue of cyberbullying is being addressed through legislation in Malaysia. The sole section of the Communications and Multimedia Act of 1998 that addresses internet abuse offences at the moment is Section 233(1). If found guilty under this section, the accused is subject to punishment under Section 233(3), which carries a maximum fine of RM50,000, a maximum sentence of one year in jail, or both, as well as an additional fine of RM1,000 for each day the offence is continued after conviction. [11]

2.4 Conceptual Framework



2.5 Research Framework



2.6 Hypothesis

- H1:** There is relationship between harassment and depressive symptomatology towards cyberbullying behaviour among social media users in Malaysia.
- H2:** There is relationship between outing and depressive symptomatology towards cyberbullying behaviour among social media users in Malaysia.
- H3:** There is relationship between flaming and depressive symptomatology towards cyberbullying behaviour among social media users in Malaysia.
- H4:** There is relationship between masquerading and depressive symptomatology towards cyberbullying behaviour among social media users in Malaysia.

H5: There is relationship between exclusion and depressive symptomatology towards cyberbullying behaviour among social media users in Malaysia.

3. METHODOLOGY

3.1 Research Design

In order to characterise a particular occurrence, a quantitative research approach was used for this study since it allowed for the acquisition of a comprehensive perspective and the collection of data from a wide range of sources. Quantitative research uses numerical representation and observation manipulation to describe and comprehend occurrences (Babbie, 2010) [2]. Determine the relationship between social media algorithm towards self-brand visibility and user engagement within a population is the aim of this quantitative research project.

Likert Scale that contained 5 point which are strongly disagree, disagree, neutral, agree and strongly agree used to measure how social media algorithm affect self-branding visibility and user engagement among local content creator in Malaysia. A Likert scale is a rating scale used to assess opinions, attitudes, or behaviours (Bhandari, 2022) [3].

3.2 Population and Sampling

Data for this study was gathered in June 2022 by primary data collection method through user survey administered among social media user in Malaysia via Instagram, Facebook and TikTok. These people are active in social media and experience the cyberbully activities on their social media account. Based on the statistic from UNICEF, Malaysia is a second high ranking for cyberbullying by 2021, the cases are involving teenagers and young adult.

3.3 Research Instrument

Questionnaires are used as the research instrument in the present study. Due to its accessibility and user-friendliness, Google Form will be used as the platform for the questionnaire. The questionnaire consists of 7 sections which is Section A for demographic, Section B, C, D, E, F, and G are based on previous study adapt and adopt method. The questionnaire uses 5point Likert Scale which is (1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree. Following data collection, SPSS will be utilised to generate the data.

Table 1: Instrument development (questionnaires)

Section	Variable	Item	Question	Source
A	Demographic	A1	Age	
		A2	Gender	
		A3	Ethnicity	
		A4	Educational Background	
B	Harassment (Sending offensive text message and picture images)	B1	I have received threatening or insulting message through social media platform.	Adapted from Calvete, E., Orue, I., Estévez, A., Villardón, L., & Padilla, P. (2010).
		B2		

			Someone has writing embarrassing jokes, rumours, gossips or comment in my social media platform.	
		B3	Someone has hack and sends a message by my social media account that could make trouble to other people.	
		B4	I have received messages massively that include threats or are very intimidating.	
		B5	I have received recorded video performing some kind of behaviour of sexual nature.	
C	Outing (Personal Information dissemination)	C1	Someone has stolen my personal information from computer.	Adapted from Brack, K., & Caltabiano, N. (2014).
		C2	Someone has slander by posting my fake photos on the internet/website.	
		C3	Someone has stolen my email access and reading my personal messages.	
		C4	Someone has done a misleading by pretending to be other gender to approach me.	
		C5	Someone has published online an embarrassing photo without my permission.	

D	Flaming (Online violence using harsh messages)	D1	Someone posting shameful picture of mine on timeline or profile.	Adapted from Balogun, N. A., AWODELE, T., BELLO, O., OYEKUNLE, R., & BALOGUN, U. (2017).
		D2	Someone laughing at me in a group.	
		D3	Someone writing offensive comment on my post or picture.	
		D4	Someone has sharing private conversation of me to public without my permission.	
		D5	Someone sending me a threatening or hurtful comments trough social media.	
E	Masquerading (Offensive communication using sybil identities)	E1	I have received a personal aggravating message.	Adapted Embong, W. H. B. W., Yaakob, Z. B., Rohani, Z. H. B., Abidin, M. B., & Ibrahim, F. B. (2015).
		E2	I have received messages related to fake news.	
		E3	Someone has disguised me in the cyber world.	
		E4	Someone has spread my personal secrets on social media.	
		E5	Others has threatened to spread private images of me on social media.	
F	Exclusion (Singling or leaving someone out of group)	F1	Someone has hanging humiliating image of me on social media.	Adapted from Calvete, E., Orue, I., Estévez, A., Villardón, L., & Padilla, P. (2010).
		F2	Someone sending links of humiliating image of	

			me to other people for them to see.	
		F3	Someone recording a video or taking pictures by smart phones while a group laughs and forces another person or me to something humiliating and ridiculous.	
		F4	Someone recording a video or taking pictures by phones while someone hits or hurts another person or me.	
		F5	Someone has deliberately excluded me from an online group?	
G	Depressive Symptomatology	G1	I feel a little interest or loss of pleasure after get bully on social media.	Adapted from Feng, Y., Huang, W., Tian, T. F., Wang, G., Hu, C., Chiu, H. F., ... & Xiang, Y. T. (2016).
		G2	I was feeling down, depress and hopeless after get bully on social media.	
		G3	I was feeling bad about myself and feel that I am is failure.	
		G4	I have started moving or speaking so slowly that other people could notice.	
		G5		

I have thoughts that I
would be better off
dead or hurting myself.

Table one above shows the instrument of a set of the questionnaire for this study. The instrument is consisting 7 sections, ABCDEFG. Section A: Biography is consisting gender, age, ethnicity, educational background. Section B: Harassment is consisting 5 questions regarding sending offensive text message and picture images. Section C: Outing is consisting 5 questions regarding personal information dissemination. Section D: Flaming is consisting 5 questions online violence using harsh messages. Section E: Masquerading offensive communication using sybil identities. Section F: Exclusion is consisting 5 questions regarding singling or leaving someone out of group. Section G: Depressive Symptomatology regarding the symptom of depressive that experience by respondent.

3.4 Pilot Study

Because it is one of the largest nations with a greater percentage of social media use, the study's pilot phase was carried out in Malaysia. By 2021, Malaysia will have more than 28 million social media users and will rank second in Asia for the number of cyberbullying cases. Thirty social media users in all took part in the pilot study. Despite this, Fink (2003) states that a pilot study should have at least 10 participants. For most studies, a sample size of greater than 30 and less than 500 is adequate, but where the sample is to be divided into subsamples, a minimum size of 30 for each is recommended by Roscoe (1975). Therefore, the number of respondents of the pilot study is acceptable with 30 respondents.

3.5 Reliability Test

Table 2: Cronbach's Alpha Reliability Test

SECTION	CRONBACH'S ALPHA	NUMBER OF ITEM
Harassment	0.782	5
Outing	0.895	5
Flaming	0.898	5
Masquerading	0.894	5
Exclusion	0.906	5
Depressive symptomatology	0.938	5

According to the Table 2, section B: Harassment use to score 0.782 (good), section C: Outing use to score 0.895(Excellent), Section D: Flaming use to score 0.898 (Excellent), section E: Masquerading use to score 0.894 (Excellent), Section F: Exclusion use to score 0.906 (Excellent) and section G: Depressive symptomatology use to score 0.938 (Excellent). All reliability is over 0.6 as a result of the justification. Alpha Cronbach's score of 0.5 is described by Pallant (2001) as a good dependability and acceptable index (Nunnally and Bernstein, 1994).

3.6 Normality Test

Table 3: Descriptive Statistics

Section	Skewness (-3 to +3)	Kurtosis (-10 to +10)
Harassment	0.032	-0.744
Outing	-0.118	-1.117
Flaming	0.89	-1.254
Masquerading	0.096	-1.057
Exclusion	0.065	-1.353
Depressive symptomatology	-0.423	-1.168

According to the table above, the data was normally distributed; as a result, each variable's kurtosis value and skewness value are in the range of ± 3 and ± 10 , respectively. The result of the skewness and kurtosis is acceptable for the study. Gawali (2021) stated that kurtosis and skewness are measurements of the symmetry or asymmetry of the data distribution, and respectively, whether the data have heavy or light tails in a normal distribution. Data may be negatively skewed (pushed to the left) or positively skewed (data-pushed towards the left side). The skewness value for Section B: Harassment with the skewness value of 0.032, and kurtosis value of -0.744, Section C: Outing skewness value of -0.118, and kurtosis value of -1.117, Section D: Flaming with the skewness value of 0.89, and kurtosis value of -1.1254, Section E: Masquerading skewness value of 0.096, and kurtosis value of -1.057, Section F: Exclusion skewness value of 0.065, and kurtosis value of -1.353, Section G: Depressive symptomatology with the skewness value -0.423, and kurtosis value of -1.168. Therefore, the following table suggests that the data was normally distribute because the values of skewness and kurtosis are within ± 3 and ± 10 , respectively.

3.7 Validity – KMO and Bartlett's Test

Table 4: KMO and Bartlett's Test

Kaiser-Mayer-Olkin Measure of Sampling Adequacy		0.907
Bartlett's Test of Sphericity	Approx. Chi-Square	509.663
	df	15
	Sig.	<.001

KMO in SPSS calculates the sample's suitability. If the Kaiser Mayer Olkin (KMO) value is greater than 0.5 Field (2000), according to Pallant (2013) the value of KMO is 0.6 and above, then the sampling is appropriate of sufficient. According to Kaiser (1974), a value of 0.5 is the absolute minimum, while values 0.7 and 0.8 are acceptable, 0.8 and 0.9 are excellent, and values of 0.9 and beyond are fantastic (Hutcheson & Sofroniou, 1999). The KMO of the study is 0.907, which is acceptable marvellous to the KMO measure interpretation. The value greater than 0.5 and a significance value for the Barlett's test lower than 0.05 and significant correlated. The degree to which one variable is associated with other variables is known as variable collinearity. Values greater than 0.4 are regarded as suitable.

3.8 Data Analysis Demographic

Demographic variable	Frequency	Percentage (%)
Gender		
Male	28	28.0
Female	72	72.0
Age		
18-25	53	53.0
26-19	30	30.0
30 and above	17	17.0
Race		
Malay	86	86.0
Chinese	8	8.0
India	1	1.0
Others	5	5.0
Education		
SPM	11	11.0
STPM/Diploma	23	23.0
Degree	61	61.0
Master	4	4.0
PhD	1	1.0

4. RESULT AND DISCUSSION

This section summarises the findings from the responses to the questionnaire on the cyberbullying behaviour towards their effects of depressive symptomatology among social media user in Malaysia. This section will describe the findings in relation to the study's objective.

4.1 Pearson Correlation

Ratnasari et al. (2016) claim that Pearson A specific kind of correlation coefficient called correlation explains the relationship between two variables as determined by how close their ratio scales are. Additionally, this value illustrates how strongly two correlation variables are related. The correlation degree consists of five degrees. Perfect: If the values are close to 1, then the correlation is considered to be perfect. As one variable rises, the others usually follow suit by rising (if positive) or falling (if negative). High degree: If the coefficient value lies between ± 0.50 and ± 1 , then it is said to be a strong correlation. Moderate degree: If the value lies between ± 0.30 and ± 0.49 , then it is said to be a medium correlation. Low Degree: When the value lies below ± 0.29 , then it is said to be a small correlation. No correlation: When the value is zero.

Table 5: Pearson Correlation

No	Relationship	Pearson correlation (r)	2-tailed	Direction & Strength of Correlation	Status
H1	Harassment > Depressive symptomatology	0.461		Low positive(negative)	Accepted
H2	Outing > Depressive symptomatology	0.471		Low positive (negative)	Accepted
H3	Flaming > Depressive symptomatology	0.658		Moderate Positive	Accepted
H4	Masquerading > Depressive symptomatology	0.522		Moderate positive	Accepted
H5	Exclusion > Depressive symptomatology	0.574		Moderate positive	Accepted

According to the above, the five hypothesis of the study is analysed according to the Pearson Correlation (r) that shows the relationship of the study's hypothesis. Nettleton (2014) the most popular technique for analysing numerical variables is the Pearson correlation approach, which assigns a value between 0 and 1, with 1 denoting entire positive correlation and 0 denoting total negative correlation. H1: There is relationship between harassment and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value of 0.461 (Moderate Positive- Accepted), H2: There relationship between outing and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value of 0.471 (Moderate Positive- Accepted), H3: There relationship between flaming and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value of 0.658 (Moderate Positive-Accepted), H4: There is relationship between masquerading and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value 0.522 (Moderate Positive-Accepted), H5: There relationship between Exclusion and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value 0.574 (Moderate Positive- Accepted).

Objective 1: *To Analyze the cyberbullying behavior towards social media user in Malaysia*

The finding of this study for Section B, C, D, E, and F is indicated that cyberbullying behavior existed in social media world. Based on the regression analysis table that has been test in this study the independent variable is accepted which is H1: Harassment the value of regression analysis (R) is 0.423 with 17.0% and Durbin Watson acceptable= 1.591, H2: Outing the value of regression analysis (R) is 0.399 with 15.9% and Durbin Watson is acceptable =1.662, H3: Flaming the value of regression analysis (R) is 0.520 with 27.1% and Durbin Watson is acceptable 1.788, H4: Masquerading the value of regression analysis (R) is 0.469 with 21.2% and Durbin Watson is acceptable 1.642, H5: Exclusion the value of regression analysis (R) is 0.524 with 27.5% and Durbin Watson is acceptable 1.665. By this result test can be conclude that the most higher cyberbullying behavior that has been experience by social media user in

Malaysia is H5: Exclusion which is the cyberbully in Malaysia tend to do singling or leaving someone out in the social media group.

Second higher is H3: Flaming where the cyberbully is tend to do online violence using harsh messages. Followed by H4: Masquerading where the cyberbully is tend to do an offensive communication using sybil identities, H2: Outing, the personal information was dissemination by cyberbully and H1: Harassment, the cyberbully is tend to sending offensive text message and picture images.

Objective 2: *To investigate the emotional effects towards victims of social media users in Malaysia.*

The finding of the study analyzed for Section G: Depressive symptomatology the emotional effects towards the victims of social media users in Malaysia were answered the hypothesis of this study. Based on the Pearson correlation table that has been test in this study the H1 show there is relationship between harassment and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value of 0.461 with direction and strength of correlation are moderate positive and the hypothesis is accepted, H2 show their relationship between outing and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value of 0.471 with direction and strength of correlation are moderate positive and the hypothesis is accepted, H3: there relationship between flaming and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value of 0.658 with direction and strength of correlation are moderate positive and the hypothesis are accepted, H4: there is relationship between masquerading and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value 0.522 with direction and strength of correlation are moderate positive and the hypothesis is accepted, H5: there relationship between Exclusion and depressive symptomatology towards cyberbullying behaviour among social media user with the correlation value 0.574 with direction and strength of correlation are moderate positive and the hypothesis is accepted.

By the finding that were find in this study, based on the results found in the tests conducted, it proves that there is an impact on the mental health of social media users who experience cyberbullying on social media. As a result of this cyber bullying behavior, has contributed to the existence of depressive symptoms to social media users. Some of them suffer from bad depressive symptoms but some of them are still able to deal with this problem well.

4.2 Regression Analysis

Regression analysis is a set of statistical methods used for the estimation of relationship between a dependent variable and one or more independent variables. It can be utilized to assess the strength of the relationship between variables and for modelling the future relationship between them. Regression analysis includes several variations, such as linear, multiple linear, and nonlinear. The most common models are simple linear and multiple linear. Nonlinear regression analysis is commonly used for more complicated data sets in which the dependent and independent variables show a nonlinear relationship.

Table 7: Summary of Regression Analysis

No	Regression analysis (R)	R square	Durbin Watson	Interpretation
H1	0.423	0.170	1.591	R=0.423(moderate correlation) with 17.0% and Durbin Watson is acceptable= 1.591
H2	0.399	0.159	1.662	R=0.399(moderate correlation) with 15.9% and Durbin Watson is acceptable=1.662
H3	0.520	0.271	1.788	R=0.520(moderate correlation) with 27.1% and Durbin Watson is acceptable=1.788
H4	0.469	0.212	1.642	R=0.469(moderate correlation) with 21.2% and Durbin Watson is acceptable=1.642
H5	0.524	0.275	1.665	R=0.524(moderate correlation) with 27.5% and Durbin Watson is acceptable= 1.665

5. CONCLUSION

Throughout the course of this study, found that various types of cyber bullying exist among social media users in Malaysia. This increasing freedom of use of social media networks, has resulted in the existence of a large group of users who dare to bully other social media users with harassment, violence and so on. Based on a study conducted on 100 respondents who were surveyed showed that, women are the group that tends to be victims of cyber bullying. Based on this study also shows that victims of cyber bullying also suffer from symptoms of depression. A small number of them admitted that they experienced feelings of wanting to hurt themselves and had suicidal thoughts. Based on a report in May 2020 found that a girl acted to hang herself for not being able to stand being bullied by a cyber bully on TikTok's account after uploading a video on the social site (Malaysia Gazette,2020).

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I-CReST 2022:118-095 - An Exploration the Effect of Fake News During Covid-19

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ABSTRACT

The Coronavirus pandemic increased the discussion about the phenomenon of fake news in the whole world. It is logical that researchers in different continents and societies addressed the phenomenon of fake news. The effect of fake news varies from one society to another, it is a reason that researchers may have different perspectives in the way they addressed its impact. The researcher tries to explore the study of fake news during Covid-19 using content analysis, the way researchers addressed the issue of the effect of fake news during the pandemic. Some researches focused on the dissemination of fake news on psychological health. While others tried to quantify the effect of misinformation on behavior. The perception of the researcher on the studies conducted on the effect of fake news, most of the researchers tries to describe the consequences of the phenomenon during the pandemic. The meaning is the relationship between fake news as a phenomenon and crisis. Moreover, the effect of fake news on the covid-19 individual responses. Some researches raise the level of awareness regarding the phenomenon, while others tried to measure its impact on psychological health of the individuals. The concepts employed in the researches raise awareness of the seriousness of the phenomenon such as disastrous consequences, hefty deleterious consequences. On the other hand, the concepts used in terms of psychological health: panic, fear, depression, and fatigue. Researches are between quantitative and qualitative research.

Keywords: Coronavirus; fake news; individual responses; psychological health

1. INTRODUCTION

In the modern age of technology, societies have lived the Covid-19 pandemic in the time of social media. Where the debate about fake news started before the pandemic for years, but the virus may have increased the importance to discuss about Fake news.

Several articles and researches published on the effect of Fake news in the time of crisis, where countries declared a state of emergency. Literature reviews studied the issue of the effect of Fake news during the pandemic. Based on the perceptions that fake news can generate hefty deleterious consequences. One of the research relied on the hypodermic needle theory as a communicative approach to study its effect on individual responses. Other research focused on the dissemination of infodemic knowing and its impacts on health, especially the psychological disorders caused by the dissemination of fake news, such as panic, fear, depression and fatigue. They argued that Fake news might have grave consequences for health behavior. On the other hand, in a study conducted by Greene, Ciara and Murphy, Gillian (YEAR) they tried to quantify the effect of misinformation on behavior: evidence of a study of covid-19. It is considered a gap due to the previous research have not provided an empirical data to support their

assumption. Many titles in the journals saying that Fake news put lives of people at risks. However, it is through researches that we can raise the level of awareness about how can fake news effect.

It is clear that fake news can increase the spread of the virus. After a discussion about the several researches conducted on the effect of fake news during the pandemic. It will make the reader more aware about its impact. Awareness pushed governments to act against fake news. In fact, many sectors faced the phenomena through communications strategies, between the government and civil society.

Therefore, the researcher delves into the research conducted on the phenomenon of Fake news during the pandemic. In addition, it allows to the research to find out about several aspects of its effect on the human being. Because of the several impacts. In such a circumstances, fake news reduce the level of awareness required to protect the health of human beings, physically and psychologically. Some researchers did not only focus on the consequences. However, they tries to focus on the level of the effect, it may pose the question about our perception of fake news, is it truly powerful in its effect.

Thereby, researchers covered different angles regarding the effect of fake news, a reason to explore the phenomon of fake news through literature review that may change our perception of the phenomon itself.

1.1 Problem Statement

The Covid-19 crisis has brought many researchers to study the phenomenon of Fake news, research may exceed the general talk about the phenomon to a discussion rely on scientific method. From searching for the degree of the effect to the several effects, that fake news can lead to. The reason to explore the studied conducted on the effect of fake news during the pandemic; it is a search for building a perception on the phenomon through its degree of impact. In addition, how can the phenomenon affect the human being, these are the two reasons which form the problem and lead to an exploration of the phenomenon of fake news through research that rely on a scientific method to address the effect of fake news. Given that, the researchers are from different societies, which may be another factor that can influence our perception of the phenomenon, the impact of fake news in society can be different in others. Therefore, the exploration take to the account the context of the phenomenon.

1.2 Purpose of the Study

1. An exploration on studies of the phenomenon of fake news and building a perception during the Covid-19 pandemic.
2. An exploration into the various effect of Fake news during the crisis based on the studies.

1.3 Research Questions

The research seeks to answer the following questions:

1. How did fake news affect people during the Covid-19 pandemic according to the studies?

1.4 Variable Conceptual Definition

Fake news: the concept refers to the false stories that appear to be news, spread on the internet or using other media, the concept is not only used to describe fabricated information but to undermine the credibility of news organizations (Nielsen & Graves, 2017; Tandoc et al., 2018). Slangit defines it as a term that refers to news outlets that pretend to be real but are actually fake. Fake news includes false stories about all sorts of topics that are crafted in order to appear real and get traffic and social shares on Facebook and Twitter. While Collins dictionary defines it as follows: false, often sensational, information disseminated under the guise of news reporting.

Fake news during the pandemic is considered as misinformation including misconstrued understandings of the disease, wishful thinking about false remedies and fanciful implications drawn on how the spread of the virus will played out.

Infodemic: World health organization defines Infodemic: much information including false or misleading information in digital and physical environment during a disease outbreak. It causes confusion and risk-taking behaviours that can harm health. It also leads to mistrust in health authorities and undermines the public health response. An infodemic can intensify or lengthen outbreaks when people are unsure about what they need to do to protect their health and the health of people around them. With growing digitization – an expansion of social media and internet use – information can spread more rapidly. This can help to more quickly fill information voids but can also amplify harmful messages.

Perception : Cambridge dictionary defines it: a belief or opinion, often held by many people and based on how things seem, based on that definition , the perception concept in this study, it means the beliefs and opinion held by researchers on fake news during the pandemic, how researchers look at the effect of coronavirus during the pandemic.

2. RESEARCH METHODOLOGY

2.1 Research Design

The research design qualitative that collect data and analyzing non-numerical data, it relies on the data obtained by the researcher from literature review, the data are non-numerical. Qualitative research include the concept: inductive, the researcher starts to collect data and then looking for patterns or drawing some kinds of theories from it.

The qualitative research design is suitable for my research for multiple reason, the data collected are non-numerical data. The data are based on literature review that conducted a research on fake news effect during the pandemic. It is an inductive approach of thinking.

Method of data collection .

The method to collect data is content analysis; it is a qualitative research tool or technique that is used widely to analyze the content and its features. It is an approach use to quantify qualitative information. it is any technique for making inferences by objectively and systemically identifying specified characteristics of messages (Holsti, 1969).

Researchers choose content analysis as a method due to the sample that contains non-numerical data, literature review on the effect of fake news phenomenon during the pandemic. The researcher applied thematic analysis and coding, it is the process of labeling and organizing your qualitative data to identify different themes and the relationship between them. Coding is to find common themes and concepts is part of thematic analysis. Thematic analysis extracts themes from text by analyzing the word and sentence structure.

The method that the researcher relied on while analyzing the content, it is initiated by a deep reading of the content in which the researcher read it multiple times in order to highlight the important sentences, words within the texts. The next process after highlighting the sentences and words is to categorize them based on the context of the paragraph. The last step is to identify themes withdrawn based on the categories.

The research focuses on two researches conducted on the impact of fake news, one investigates the psychological impact conducted by Yasmim Mendes Rocha on The impact of fake news on social media and its influence on health during the COVID-19 pandemic: a systematic review. The second research conducted by Zapan Barua and others on Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation.

2.2 Sample

The sample chosen is a purposive sample, in which the researcher will use own judgment in selection of sample, usually based on specific characteristics or qualities. The characteristics used by the researcher are the recent research conducted according to date between 2020-2021, according to the field of study that should be different in terms of tackling the phenomenon of fake news in order to respond to the questions of the problem statement. Two characteristics are used to identify the sample, the year of the research, the angle of the research.

2.3 Sample Size Determination

The researcher determines the size of the sample through a purposive sample, if the research targeted the effect of the fake news in terms of its degree, if the literature review targeted the phenomenon of fake news in different angle of study. Due to the time to submit the research, I only focus on two researches conducted on the effect of fake news. The first research conducted by Zapan Barua and others on Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation, in July 2020. The second research conducted by Yasmim Mendes Rocha on The impact of fake news on social media and its influence on health during the COVID-19 pandemic: a systematic review.

3. THE EFFECT OF FAKE NEWS DURING THE PANDEMIC COVID 19

Table 1: The psychological effect of fake news on social media during the pandemic

Psychological effect	Psychological situation	Psychological problems
Milder effect To more serious problems	Being confused Fearful situation Being afraid	Fatigue Emotionally exhausted stress insomnia anger panic Anxious Depressed
Psychological effect	Psychological situation	Psychological problems
Milder effect To more serious problems	Being confused Fearful situation Being afraid	Fatigue Emotionally exhausted stress insomnia anger panic Anxious Depressed

Conspiracy belief	Psychological problems
Conspiracy theories : The virus being a biological weapon, created either by the US (to destroy Chinese) or China (to destroy Americans)/	fear and confusion.

Table 1 shows that the psychological effect due to the effect of Fake news is describes as milder effect, the person affected by Fake news is between three psychological situations: he may be confused, afraid and fearful situations. It also list the psychological problems that a person could experience as a result of being affected by Fake news such as: fatigue, stress, insomnia, anger, panic anxious, depressed.

The results aimed to describe the effect of fake news on psychological health. Therefore, the perception can build on the effect is that Fake news affect psychological but does not deteriorate the psychological health of the person. The effect is milder symptoms such as: fatigue, stress, insomnia and anger.

The fact perceived about psychological effect, the psychological situations are due to the nature of the fake news, meaning to say that fake news are a set of false stories and information. Thereby, a state of being fearful is a reason of certain false news; someone can experience different situations at the same time. Meanwhile, the psychological problem varies due to the stories varied.

The problems resulted from the effect are not far from each other but vary in degree, for instance: stress/ anxious/ panic. In addition, other problems such as: anger, fatigue, depression.

The perception could we build is that fake news impact the psychology of a person, it cause several psychological problems. These problems are milder symptoms or we can describe them not severe. However, it may lead to problems that are more serious.

The second part of the table shows the relationship between conspiracy belief and psychological problems. A possibility to perceive other facts about the impact, conspiracy beliefs are a factor that effect the psychology of the person differently comparing to other fake news.

I conclude that psychological problems caused by the fake news during the pandemic are milder effect. Someone can experience anxiety, but he cannot live a severe anxiety during pandemic due to Fake news. The effect of Fake news are milder.

The sentences and words are identified from the title: the potential risks of misinformation, the themes withdrew from the texts are three situations and some problems and the nature of effect. Therefore, the researcher identified three themes: psychological effect, psychological situation, and psychological problems. The table is followed up by a small table that shows 2 themes: conspiracy beliefs/ psychological problems, in which, the researcher highlighted from Table 4 within the same title.

Table 2: The types of fake news on social media during the pandemic

Health misinformation	Conspiracy mis information	General misinformation	Religious misinformation
pure alcohol — methanol — could eliminate the virus in the contaminated body	A vaccine that controls people	Coronavirus is not heat-resistant and will be killed in a temperature of 26-27 degrees	a conservative Pentecostal preacher in Brazil, mark a day as anti-COVID “Day of Abstinence”, affirming that fasting would yield a miracle to heal.
/ Rinsing the mouth with brine can prevent COVID-19	The virus being a biological weapon, created either by the US (to destroy Chinese) or China (to destroy Americans)/		
Alcohol consumption			
using ultraviolet light			
using nasal spray			
garlic or chlorine on the skin			

smokers are less vulnerable to COVID-19		
eating Centella Asiatica (Asiatic penny-wort in India or “Thankuni” in Bangladesh) will prevent coronavirus infection		

Table 2 shows different examples of fake news from health information as false information between local and international misinformation to conspiracy information of biological weapons and the vaccine that controls the weapon. In addition, general information such as Coronavirus is not heat-resistant and will be killed in a temperature of 26-27 degrees, and religious misinformation.

It seems to me that misinformation and fake news are within various fields. Therefore, its goal is intertwined and diverse. The goal is not to look for the intention of spreading fake news. However, during the pandemic, fake news and misinformation included false information from various fields in regard with the virus. Most of health misinformation included products where a citizen is a customer. Conspiracy theory regarding the virus included the concept of power. Coronavirus is not heat-resistant and will be killed in a temperature of 26-27 degrees, wrong information far from politics and the concept of power, products. Hence, this misinformation is considered wrong scientific information. Fake news between power, products and wrong scientific information, these three concept represent fake news during the pandemic.

The themes in Table 3 are withdrew from the both studies, from the title: Conceptual framework and hypotheses development in the study conducted on Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation. As well as, in the title: Content and propagation of fake news circulating on social networking platforms in the study conducted by on The impact of fake news on social media and its influence on health during the COVID-19 pandemic.

Table 3: The effect of fake news on individuals

Negative individual responses	Positive individual responses
Conspiracy theories	credibility sources: when users of social networks engaged themselves in credibility evaluation of information, they respond to a message in a more responsible way
Health misinformation	
General misinformation	

Table 3 represents the effect of fake news on individuals, it is categorized between positive and negative. There is only one case in which the effect is positive, credibility sources are not fake news. Therefore, fake news always have a negative response toward coronavirus.

As noted above, a positive response is to respond to a message in a more responsible way. Thereby, negative response undermines the response that lead to inoculate against coronavirus.

Thereby, health information, general information, conspiracy information effect the response of individuals to inoculate against coronavirus. It is the definition of negative response that describe the effect of coronavirus in regard with the pandemic.

The themes are: negative individual responses/ positive individual responses, the themes are identified from relating title: The literature on misinformation, COVID-19 and individual responses in the study conducted by by Zapan Barua and others on Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation.

Table 4: The relationship between Age an sharing fake news on social media

Age	Sharing fake news
individuals over 65 years	share up to seven times more unverified information when compared to other age groups

Table 4 represents the correlation between age and spreading fake news. Individuals over 65 years share up to seven times when compared to other aged. Thereby, aged people are more effected by fake news. The age is factor added to the time.

I conclude that fake news are more believed by the aged people or individuals more than 65 years. In addition, the effect is not stable; the effect varies in accordance to the time and age. Fake news do not affect people the same way, because people are variables.

The themes are: age and sharing fake news, the themes are identified from the title: Susceptibility to spreading fake news according to education and age of the population in the study conducted by conducted on the impact of fake news, one investigates the psychological impact conducted by Yasmim Mendes Rocha on The impact of fake news on social media and its influence on health during the COVID-19 pandemic: a systematic review.

Table 5: The evaluation of credibility on social media and its reasons

Credibility evaluation	Reasons credibility evaluation
sharing unverified information trust in information they found on social media believing and affected	skills needed to identify questionable content
	digital media literacy

Table 5 represents the evaluation of credibility, fakes news affect individuals who do not evaluate the credibility of sources, they share unverified information, they trust in information they found on social media. Moreover, they believe and affected.

As noted above, I conclude that fake news affect people who do not evaluate the credibility of sources for some reasons. Those people lack skills needed to identify questionable content,

the second reason is digital media literacy. Thereby, the effect of fake news is due to evaluation of sources credibility.

The themes are: Credibility evaluation/ reasons credibility sources, which are identified from the study conducted by Zapan Barua and others on Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation. In the title: credibility evaluation that answer the hypotheses 4 in the study.

4. DISCUSSION

The data analyzed showed that the effect of fake news on the psychological health is a milder effect, people are between three states psychologically: confused, fearful and afraid. Individuals experienced many symptoms such as: stress, anxiety, fatigue and so on. A milder effect means that individuals the effect is not severe, there is no case with severe fatigue or anxiety. Meanwhile, some fake news may have a distinctive impact on the psychology of individuals. For instance, conspiracy beliefs lead to fear and confusion as an effect. There is relationship between the type of fake news and the psychological impact.

There is a relationship between time spending on social media and the psychological effect. On the other hand, the factor of age is related to the level of sharing fake news on social media. Individuals more than 65 years old share unverified information more than other groups, the eldest are the most people who do not verify the information on social media, so they are more susceptible to the effect of fake news.

Fake news are were from diverse context during the pandemic, between power related to conspiracy theory, products related to health misinformation and wrong scientific information, and religious misinformation. The four concepts represent fake news during the pandemic. The effect of fake news on the individuals was described as negative response, meaning to say that only credibility that owns a positive response. Therefore, fake news undermines the response that lead to inoculate against coronavirus. Thereby, health information, general information, conspiracy information effect the response of individuals to inoculate against coronavirus.

Fake news affect people who do not evaluate the credibility of sources for some reasons. Those people lack skills needed to identify questionable content, the second reason is digital media literacy. Thereby, the effect of fake news is due to evaluation of sources credibility.

5. CONCLUSION

The researcher tried to build a perception about the effect of fake news during a crisis (Coronavirus), the perception reached in this study is limited to the number of studies that researcher included in this research. The psychological effect is not severe, meanwhile people experiences three situations: being afraid, fearful situation, being confused. On the other hand, it undermines the response to inoculate against coronavirus. There are medium variables that interfere in the effect of fake news that can shape our perception such as age and education, time and evaluation of sources. Due to these factors, the population of the research varies regarding the effect of fake news.

A misinformation such as conspiracy theory can lead to a state of being confused and it leads to negative individual responses, other misinformation can cause a fearful situation and lead to certain psychological problems.

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I-CReST 2022:131-100 - Exploring Pre-Service ESL Teachers' Practice in Enhancing Reticent Students' Participation

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ABSTRACT

In ESL classrooms, it is a common phenomenon to have reticent students. ESL teachers struggle to understand the reticent behaviour and often face challenges to handle students with such behaviour. Therefore, this study intends to explore pre-service ESL teachers' practice in enhancing classroom participation among reticent students. In addition, the behaviours of reticent students and the challenges encountered by pre-service ESL teachers in enhancing reticent students' participation were also explored by the researcher. Qualitative data were collected through the means of interviews and documents analysis. Interviews were carried out on a sample of three pre-service ESL teachers from University of Malaya. The data of this study were then analysed using open coding, axial coding and generating themes. The findings were then tabulated in a coding matrix. Documents provided by the research participants in the form of lesson plans were also analysed for the purpose of research triangulation. Results revealed that there are six significant strategies used by pre-service ESL teachers in enhancing reticent students' participation. The behaviours of reticent students and the challenges encountered by pre-service ESL teachers were also discussed. Further discussion and recommendation are explained in this study.

Keywords: Reticence; ESL classroom participation; pre-service teachers

1. INTRODUCTION

In the teaching and learning of English as a Second Language (ESL), students' participation is equally essential as teachers often encourage students to participate in class. However, this may be a challenge for reticent students. Reticence has always been a common problem among ESL learners, especially with Asian students [9]. [6] believed teachers are accountable to determine opportunities for students' participation. Since learning is student-centred, this might be a problem for reticent students who find it difficult to participate in class. Reticence not only restricts them from sharing their knowledge but also restrains others from benefiting from it [4]. Within the ESL context, [1] observed students who are confident tend to dominate discussions whereas reticent ones remain silent throughout the activity. This might be due to reticent students' insecurities of negative perception and sensitivity to the judgment of others. Reticent students not only show the unwillingness to participate but also the feeling of secluded from peers. They also do not understand the value of engagement, thus these students tend to keep quiet in class activities [4].

In addition, teachers find it challenging to deal with students' reticence. [9] claimed ESL teachers feel uncomfortable when there is no participation because their teaching is reflected negatively. In the twenty-first-century learning environment, student-centred approaches are increasingly implemented with teachers regularly conducting activities where students' participation is crucial. Despite having years of experience, many ESL teachers are still incapable of decoding the reticent behaviour. They struggle to implement appropriate teaching strategies in enhancing participation among reticent students.

Only few studies have been conducted to explore teachers' practice in enhancing reticent students' participation in ESL contexts. Among these limited research, most of them were conducted in Chinese contexts ([3]; [6]; [11]) with few considering ESL learning environments such as Malaysia. In addition, not many studies emphasize how teachers can enhance participation among reticent students. Hence, this scarcity demands more thorough explorations on the strategies that can be used in enhancing reticent students' participation. Given the scarcity of research in this area, particularly in Malaysia, this study was undertaken to investigate students' reticence in ESL classrooms at the tertiary level. To achieve this aim, the following research questions guided the present study.

1.1 Research Questions

1. How do pre-service ESL teachers identify the behaviour of reticent students in a classroom?
2. What are the strategies used by pre-service ESL teachers in enhancing participation among reticent students?
3. What are the challenges encountered by pre-service ESL teachers in enhancing participation among reticent students?

2. BODY

2.1 Conceptual Framework

In the study, the independent variable is "strategies used by pre-service ESL teachers" while the dependent variable is "participation level of reticent students". The figure below illustrates the conceptual framework of the study which represents the relationship between the independent and the dependent variable. The definition of reticence in this study is based on previous study done by [5]. Another study done by [2] which discussed six strategies in enhancing reticent students' participation will also be used as a guide for this research. In addition, the moderator variable, "challenges encountered by pre-service ESL teachers in enhancing reticent students' participation" is also included in the conceptual framework. The moderator variable might alter the effect that the independent variable has on the dependent variable of the study.

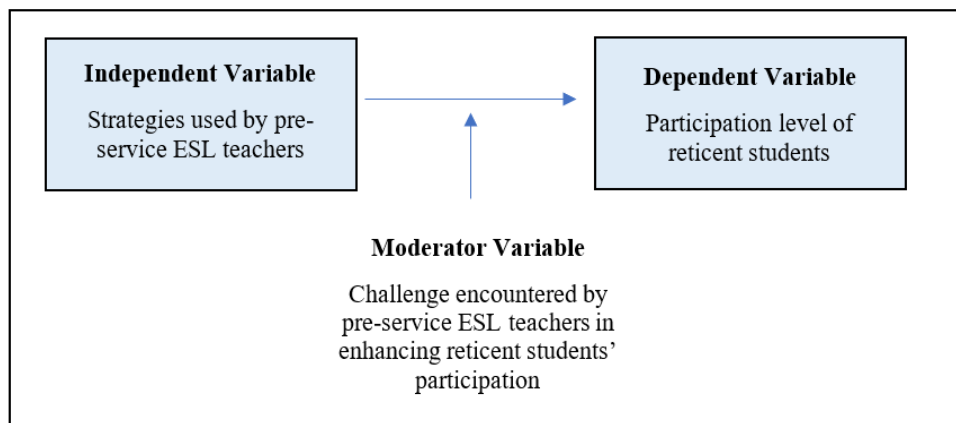


Figure 1: Conceptual Framework

3. METHODOLOGY

In this research, the data were collected through a semi-structured interview with 3 pre-service ESL teachers from the Faculty of Education, University of Malaya who have undergone 10 weeks of teaching practicum, hence making this study a qualitative research. Qualitative method was chosen to explore how pre-service ESL teachers' practice in classrooms can enhance participation specifically among reticent students. An interview session was recorded to further analyse the answers given by the participants. The interviews were conducted with each participant on a one-on-one basis and covered a duration of 15 to 20 minutes. The interview sessions were recorded to capture data more effectively and to generate verbatim transcripts. For the purpose of triangulation, each research participant was required to provide at least one copy of the lesson plan which they have used during their teaching practicum. The activities in the lesson plan should reflect their teaching practices in enhancing reticent students' participation.

The first step for data analysis procedure of this research was transcribing each interview. After they were transcribed, the raw data were read and interpreted. The interview transcripts were read one at a time to make sure the interpretations are accurate. Next, the data were coded according to the research questions. Similar patterns were identified after the codes were developed. These patterns were then used for the development of categories. The final step of data analysis for this research is the development of themes. The findings were then tabulated in a coding matrix.

4. FINDINGS

The interview transcripts and documents were analysed thoroughly based on the research questions and the results are divided into three.

4.1 Reticent Students' Behaviour

When identifying the general behaviour of reticent students, all participants mentioned that reticent students show a similar pattern of behaviour which demonstrates nervous gestures, communication difficulties and passive characteristics. As for their behaviour during group

activities, all of the participants agreed that reticent students behave passively, especially when working with dominant students. Participants also mentioned that reticent students participate better in pair works where collaboration and support from a safe and familiar environment were noticed.

4.2 Strategies in Enhancing Reticent Students' Participation

The strategies used in enhancing reticent students' participation vary in each participant. Based on the data gathered, six major strategies in enhancing reticent students' participation are identified. The first strategy implemented by all participants is to increase the wait time. Secondly, all of the participants used the right questioning techniques. They claimed that using the right questioning technique helped to reduce reticent students' pressure to provide spontaneous answers. All three participants mentioned that they utilized peer support and group work in enhancing reticent students' participation by implementing cooperative learning strategies. Activities conducted include puzzles, quizzes, jigsaw technique and think-pair-share. In addition, two of the participants used the facilitator-oriented strategy to utilize peer support. Participant A used a friendlier method in assessing students, whereas Participant C limited her power to control over the lesson by giving students responsibilities to carry. In terms of learning content, two participants stated that they applied CBI which involves meaningful real-life contexts in lessons. This strategy is believed to be effective in enhancing reticent students' participation because the learning content is relatable to them. However, one participant said that he did not specify a particular learning content because it might be biased to just cater to the reticent students. Instead of focusing on the learning content, the participant mentioned that the teaching strategies used by teachers are more important. Lastly, all three participants mentioned that establishing a good teacher-student relationship helps in enhancing reticent students' participation. The strategies to establish the relationship include giving motivation, positive teachers' behaviour, teachers' immediacy and gaining trust.

4.3 Challenges Faced by Pre-service ESL Teachers

For the last research question, participants were asked regarding the challenges they faced in enhancing participation among reticent students. All of the participants faced difficulties such as overcoming reticent students' fear of negative evaluation, limiting the teacher-student gap and emotional challenges.

Hence, the participants had come to a general consensus which answers the three research questions. Firstly, participants agreed that reticent students show a similar pattern of behaviour in class, during group activities and pair works. Next, six strategies used by the participants were categorized and analysed which are lengthening wait time, using the right questioning technique, handling students' responses, utilizing peer support and group work, focusing on learning content and establishing a teacher-student relationship. The participants mentioned that the strategies helped in enhancing reticent students' participation and reducing their fear of negative evaluation. Based on the lesson plans provided by each participant, the strategies mentioned by participants are implemented during lessons were also identified. Lastly, participants also shared the challenges they had to face in enhancing reticent students' participation. Although the challenges encountered by each participant vary, all of them have stumbled upon obstacles that not only affected the teaching process but also their emotions.

5. DISCUSSION

5.1 Reticent Students' Behaviour

This study has identified reticent students' behaviours based on the data collected. The participants described reticent students' behaviour thoroughly and the findings have been divided into three sections which are the general behaviour of reticent students, reticent students' behaviours in group activities as well as their behaviours during pair work. Based on the findings, the participants mentioned reticent students had nervous gestures, communication difficulties and passive characteristics during participation. These findings are in line with Phillips (1997) who described reticent individuals as those who avoid participation and display nervous mannerism (as cited in [5]). A study by Gan (2012) had also observed reticent students experience communication difficulties and find it hard to get involved in English lessons (as cited in [7]). Therefore, it can be concluded that the behaviours described by the participants are indeed the indicators of reticent students. The findings show that reticent students possessed a certain behaviour in group activities such as keeping their opinion to themselves and becoming submissive towards dominant students. This behaviour is due to their fear of being judged for committing mistakes. [3] revealed that reticent students care about peer judgments. Hence, this might be why they chose to stay silent in group activities than to risk committing any errors. They are afraid that they might be judged by their surroundings, especially by the dominant ones. All three participants stated that reticent students were more comfortable during pair activities. This is because support from a safe environment is evident. According to Wilen (2004), he suggested teachers form pairs of students to stimulate discussion so that they could prepare with their partner before the actual activity takes place. This will reduce students' reticence as they have received validation from their partners. Reticent students also felt more comfortable during pair work because less interaction is needed as compared to a larger group activity.

5.2 Strategies in Enhancing Reticent Students' Participation

For the second research question, the researcher aims to explore the strategies used by participants in enhancing reticent students' participation. The discussion of the findings is divided according to the strategies used by the participants.

5.2.1 Increasing Wait Time

A study in second language learning by Brinton (2014) stated that students need more time to formulate their answers and sufficient wait time is necessary (as cited in [2]). This correlates with the findings of the research because the participants mentioned that they lengthen the wait time in order to provide reticent students with an opportunity to participate. When teachers give more time for reticent students to jot down their answers and let them discuss before sharing it with the whole class, it will reduce their fear of making a mistake. Hence, they will be more open to the idea of participating in class.

5.2.2 Questioning Technique

As stated in the previous chapter, participants used the right questioning technique as a strategy in enhancing reticent students' participation. Questioning techniques used by participants such as asking students to write their answers on the board or on a piece of paper will reduce

students' pressure to provide spontaneous answers. When teachers do not push reticent students to answer questions quickly, it encourages and stimulates their thinking better, resulting in reticent students to be more likely to participate in answering questions.

5.2.3 Handling Students' Responses

It is also found that there are prominent strategies to handle reticent students' responses. Since reticent students are afraid of committing errors and being negatively evaluated, one participant, in particular, mentioned that students' responses must be handled accordingly. A significant strategy mentioned by the participant is to be more accepting of students' responses and providing them with alternative answers. These findings are consistent with a study by [10] which suggested teachers to remind students that there may be more than one correct answer to a question. As a result, a culture of sharing will exist in a classroom and subsequently helps in enhancing reticent students' participation.

5.2.4 Peer Support and Group Work

Utilizing peer support and group work through cooperative learning and facilitator-oriented strategies were methods mentioned by participants. This finding ties well with previous study wherein Wilen (2004) stated that social support can enhance students' participation. Through cooperative learning strategy, reticent students are allowed to open up in a safe learning environment because they start working together within small groups first. This allows them to prepare themselves before participating and presenting their ideas to a much bigger group. On the other hand, facilitator-oriented strategy utilizes peer support in a sense that the teacher acts as a facilitator and encourage students to participate without having the full authority in the class. This will most likely enhance reticent students' participation as their fear of being evaluated by the teacher is reduced.

5.2.5 Content-based Instruction (CBI)

From the findings, it is clear that using CBI helped reticent students to participate. CBI focuses on topics which are relatable and meaningful to students such as topics on science and technology, as referring to Participant B's lesson plan. This will automatically spark an interest in reticent students to participate because they consider the topic to be relevant. However, it is important to note that one participant did not specify any learning content in his lessons as it might be a biased act to specifically cater to reticent students. To a certain extent, this might be true as each learner has individual differences.

5.2.6 Teacher-student Relationship

Another promising finding in enhancing reticent students' participation is the establishment of teacher-student relationship. As mentioned by participants, they established a bond with their students through strategies like instilling motivation, ensuring a positive teacher behaviour and gaining students' trust. These findings are directly in line with other previous studies including [2] and [8]. When a good relationship between teachers and students exist, reticent students will be more comfortable to share their thoughts because their fear of being negatively evaluated is diminished.

5.2.7 Challenges Faced by Pre-service ESL Teachers

For the last research question, researcher asked about the challenges faced by pre-service ESL teachers in enhancing reticent students' participation. Participants experienced emotional challenges in which they feel frustrated whenever reticent students do not participate in the activities conducted. This is consistent with what has been found in Flowerdew and Miller (1995) which stated students' reticence is considered a source of frustration for both teachers and students [1]. When reticent students refuse to participate, it will restrict them from progressing and the objective of the lesson might not be accomplished. Hence, it disrupts the teachers' instructional plan and consequently affects their emotional state. Another significant finding that needs to be highlighted is the challenge of enclosing the gap that exists between teachers and students. Participants mentioned that reticent students hesitate to share anything with their teachers. Under certain assumptions, this can be construed as a sign of respect among Asian students for their knowledgeable teachers. Previous studies ([9]; [3]; [13]) agreed that the legacies of Confucius have greatly influenced the Asian culture. For Asian students, passivity in class is an indication of respect for the teacher. Therefore, it is possible that reticent students refuse to share to maintain the gap and preserve the respect for their teachers.

5.3 Limitations of Study

After conducting this study, the researcher is aware of its limitations. Firstly, the timing of the research may have influenced the data gathered. The research is done to explore pre-service ESL teachers' practice in enhancing reticent students' participation but it is conducted only a few months after they have ended their teaching practicum. Hence, there might be some information gap that the participants may have forgotten. Other than that, the participants of this research are pre-service ESL teachers who only spent 10 weeks teaching in schools. They might not have sufficient experience dealing with reticent students. Hence, the data gathered might miss out on some essential information.

5.4 Recommendations for Future Research

It is hoped that the findings from this research will serve as a foundation for future research in the area of the reticence construct. The shortcomings of this research have led to some recommendations for the betterment of future research. Firstly, increasing the number of research participants. Researcher thinks that the research could benefit from a larger sample of data as the findings can be more conclusive. Secondly, future research that employ both qualitative and quantitative method can be carried out. Through research triangulation, the data gained can be more credible and valid. Since this study only focuses on the teaching ESL at the secondary level, future research with a more varied field of learning contexts and levels can be conducted to explore more practices in enhancing reticent students' participation. Lastly, future research with experienced teachers can also be carried out to gain more significant findings that may help resolve the issue of reticent students.

6. CONCLUSION

In conclusion, all of the research questions of this study have been answered. The findings of this research revealed the behaviours of reticent students, strategies used by pre-service ESL teachers in enhancing reticent students' participation as well as the challenges faced by pre-

service ESL teachers in doing so. It is hoped that this study has given a vivid and clear explanation in the area of enhancing reticent students' participation in ESL classrooms.

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I-CReST 2022:134-123 - The Survey of Students' Learning Style Tendency as the Practical Worksheet Delivery Strategy with Adaptation to New Norms for the Course Wireless Communication System in Politeknik Port Dickson

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ABSTRACT

COVID-19 has left a great impact to the teaching delivery strategy today. Online teaching and learning (OTL) have gained popularity due to the movement control order, control of the disease contagion, and the enforced limitations. Nonetheless, a question arises on how the OTL developed needs to lessen the students' cognitive burden in developing meaningful learning, especially for abstract course delivery that requires high cognitive processing. Thus, a survey is conducted to see the learning style tendency of the Electronic Engineering (Communication) (DEP) diploma students in Politeknik Port Dickson (PPD) undertaking the course Wireless Communication System using the Felder-Silverman Learning Style Model (FSLSM) as its basics. Using the Felder-Solomon Learning Style Index, the domination of the student learning style dimension can be measured, if it has a tendency towards the active-reflective, verbal-visual, or sequential-global learning type. Based on the finding, DEP PPD students have a strong tendency towards the visual learning style. The reliability of both the pre-test and post-test also shows a significant consistency on the study results. Finally, the finding from this study is able to assist lecturers in preparing and implementing an effective delivery strategy in line with students' learning style so that meaningful learning can be achieved.

Keywords: Learning style, Online Teaching and Learning (OTL); Felder-Silverman Learning Style Model (FSLSM)

1. INTRODUCTION

The electronic learning technology or e-learning is able to empower an institution. The learning style tendency can be defined as a dominant method or approach for one to understand the content of the lesson delivered. The learning style tendency is one of the most important elements in ensuring that the student is able to learn well and effectively [1]. Learning style tendency is also one of the factors that determine success or failure, increase motivation and the mind of a student to continue to focus on the teaching material delivered to him [2-5].

However, in a teaching and learning process, there is a limitation in the delivery strategy. Some include lecturers have their limitations in the teaching delivery strategy that fits the learning style tendency profile of every individual in their lecture. For this, it is essential for a lecturer to identify a dominant learning style tendency among the target group so that the

limitation can be overcome. Based on the study [6], to identify the relationship between the teaching delivery strategy and the learning style tendency in increasing students' performance and achievement. The study reveals that better performance is achieved if the delivery strategy goes harmoniously with the learning style tendency [6,7].

The study done to identify the relationship between teaching delivery strategy and learning style tendency in increasing the performance of achievement is carried out again by [8]. This time, it is conducted by pre-service teachers totalling 182 teachers who teach Education Science and Economic Science. The finding shows that there is a significant difference towards the performance of achievement among the group that is not consistent with the delivery strategy they received. This shows that a student's teaching delivery strategy that is consistent with the learning style tendency will give a better impact on their performance of achievement [7,9].

Student's readiness to learn is an area that needs to be given attention as they are the main subject for the knowledge that is to be delivered. Although lecturers are enthusiastic in supplying various OTL materials, without student participation, the learning outcome or objective intended will not be able to be delivered well to the students. This will create a gap, in terms of the equality of access to education to some students who do not have the access to technology. What can be done by the lecturer to ensure that the learning objective is achieved is by using the existing materials, like lecture notes and practice worksheet, with the addition of the materials shared on the Internet or existing applications on Google Store or in the Apps Store. The evaluation method can also be done simultaneously or otherwise, through various methods like the video, screenshots by students, evidence materials that students find or revise online such as in CIDOS portal or many others.

In brief, the development of the practical worksheet and the learning style tendency that works well with the added value of the existing applications on Google Store or on Apps Store will influence the active processing for an individual in building a coherent mental model [9-11]. If this active processing is disturbed, it will make the meaning knowledge formation process become complicated. However, the question is, how does the learning style tendency give an impact to students' performance, especially in delivering abstract content? Also, how does it adapt to the new norms of teaching and learning online? On this token, this study will answer the questions raised.

2. METHOD OF IMPLEMENTATION

This study is carried out to see the learning style tendency of DEP, PPD in receiving self-technology-aided delivery strategy on the implementation of the course practice Wireless Communication System. There are various models of learning style, where some include Kolb Experiential Learning Theory, Honey and Mumford Learning Style, and Felder–Silverman Learning Style [12]. Most of the learning style models categorise the learning style to certain groups. That said, the FSLSM has classified learning style in further detail based on four given dimensions. Other than that, FSLSM theory is also based on the individual learning tendency, also his habit and attitude in identifying the sources of information received. One's tendency may change based on the situation how the information is received [13].

For this study, the selection of learning style based on the Felder and Silverman model as the learning style tendency evaluation model is due to the following factors. First, the use of

Felder-Silverman Learning Style Model in looking into students' tendency when receiving the technology-aided delivery strategy that can divide the tendency based on how a student receives and processes the information [14]. Second, this model has been proven in several previous studies where the validity of the model as an instrument to measure students' learning style tendency is based on high correlation relationship between 0.5 and almost 0.8 in every alternate repeat test (between 7 and 8 months) for every dimension, in fact the construct for the ILS Felder-Silverman dimension tendency is based on dual-dimension (active/reflective, sensory/intuitive, visual/verbal, sequential/global) and the tested effectiveness and validity of this construct in ascertaining an individual's learning style tendency [15-17]. Third, this model is user-friendly as well as the fact that the decision is easy to interpret and understand [18].

This study adopts the FSLSM based on the dimension stated earlier. FSLSM is used in studies linking learning style and technology-aided delivery strategy [19]. FSLSM is also one of the testing methods of learning style that can give intrapersonal knowledge or part of the meta-knowledge. It refers to the knowledge about one's own thoughts, also the same memories and tendencies. The intrapersonal tendencies will give information to the educators about the thinking style stimulation tendency in the minds of their students and this will definitely become the main guidance in building an effective delivery strategy among the educators [2]. FSLSM testing is based on the four dimensions of tendency, and every dimension has specific traits, as explained in the following Table 1.

Table 1: The Comparison of Dimensions of the Felder-Silverman Learning Style Model

Dimension	Criteria
1. Active-Reflective Dimension	<p>Active students will use the teaching materials actively, try something new and conduct the lessons collaboratively.</p> <p>Reflective students will think first before using the learning material and conduct self-study or with only a few selective friends. Reflective students contrast with active students.</p>
2. Sensory-Intuitive Dimension	<p>Sensory students love facts and concrete explanation of the learning material. This dimension prefers to use a certain step or standard in solving problems. They prefer to a more realistic and appropriate approach.</p> <p>Intuitive students are a contrast to the sensory dimension. They prefer creative and innovative problem solution, and they look into all the possible solutions used.</p>
3. Visual/Verbal Dimension	<p>Visual students have the tendency to understand the visual-aided delivery, diagrams, flow charts and so on.</p> <p>The students of this dimension also have the tendency to understand texts, and reading compared to verbal</p>
4. (Sequential) – Global Dimension	<p>Students who are inclined to the sequential dimension will find it easy to understand the delivery strategy that takes place step by step until they reach the problem-solving stage. The students of this dimension will have a linear development of understanding.</p> <p>Students from the global dimension are able to accept the delivery strategy randomly and are able to resolve complex problems as a</p>

	whole, whereas those from the sequential dimension understand the concept thoroughly and in detail.
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This survey is done based on the questionnaire proposed by Index of Learning Styles- ILS [20] as the study instrument. Respondents comprise of 56 students who are enrolled in the Wireless Communication System course. Next, the questionnaire finding will be analysed via the descriptive statistics using the SPSS software.

3. FINDING AND DATA ANALYSIS

The Index of Learning Styles (ILS) is developed by Felder and Solomon. ILS contains 44 items of questionnaire that have been developed to identify the learning style based on FSLSM. Based on the previous explanation, FSLSM will identify the tendency of the learning style based on four dimensions. This dimension tendency level contains the value of +11 to -11 with every level of difference ± 2 . Every dimension contains 11 questions. For example, if the respondent answers the active/reflective dimension questions, and the respondent chooses active tendency, the value +1 will be given in the dimension and at the same time reducing the value of 1 in the reflective tendency.

Thus, every question will have a value either +1 (answer a) or -1 (answer b). The choice of answer matches with the tendency dimensions (answer a) - active, sensory, visual, or sequential whereas the tendency dimension (answer b) - reflective, intuitive, verbal, or global. The ILS tendency level is divided into several levels, based on the scores obtained as shown in Table 2 below:

Table 2: The Score Distribution and Tendency Level Based on ILS [20].

Score	Tendency Level
1 – 3	A balanced tendency between matching dimensions (active/reflective, sensory/intuitive, visual/verbal, sequential/ global).
5 – 7	A moderate tendency between matching dimensions (active/reflective, sensory/intuitive, visual/verbal, sequential/ global). A more flexible preparation strategy process without leaning on any given dimension tendency.
9 – 11	A strong tendency between matching dimensions (active/reflective, sensory/intuitive, visual/verbal, sequential/ global). The delivery strategy preparation process has to cater for the dimension tendency.

3.1 Study Scope

This study is conducted by DEP, JKE PPD students from semester 5 undertaking Wireless Communication System course. It seeks to investigate the suitability of the practical work worksheet delivery strategy with the adaptation to the new norms for the course.

3.2 Study Objective

This study aims to identify the students' learning style tendency especially semester 5 DEP students undertaking the course Wireless Communication System course for an effective learning delivery strategy can be developed.

3.3 Respondents' Backgrounds based on Gender

Based on table 3, a total of 56 respondents targeted based on the number of genders were 27 males and 29 females.

Table 3: Respondents' Background

Gender	Frequency	Percentage
Male	27	48%
Female	29	52%

3.4 FSLSM Tendency Dimension

There are eight tendency dimensions studied which are active, reflective, sensory, intuitive, visual, verbal, sequential and global in index learning styles. The findings are as shown in table 4.

Table 4: Tendency Dimension Based on ILS

Dimension	Percentage			Min	SD	N=56
	1 – 3	5 - 7	9 - 11			
Active	64.7	26.5	8.8	3.47	2.68	36
Reflective	85.7	14.3	0	2.57	1.37	20
Sensory	71.4	28.6	0	2.93	2.05	40
Intuitive	85.0	15.0	0	2.10	2.26	16
Visual	33.3	33.4	33.3	5.89	3.38	50
Verbal	100	0	0	1.67	1.03	6
Sequential	53.8	38.5	7.7	4.08	2.45	48
Global	86.4	9.0	4.6	2.63	2.08	8

According to Cone of Learning (from Edgar Dale's Experience, 1946), 50% of passive learning in the Problem Based Learning (PBL) approach is through the visual and aural forms. This can be proven by referring to the study finding that shows that visual tendency is a dominant learning style among the students. However, the standard deviation distribution staying at the range 3.38 is great, compared to the standard deviation distribution for other tendency dimensions. This may illustrate the existence of the relationship between the level of visual stimulation of a student and that of others, based on the less consistent standard deviation distribution. Meanwhile, the standard deviation for the verbal tendency dimension has a homogenous distribution. This shows that respondents have a low verbal tendency level compared to other tendency levels at the range of 1.03.

Due to this, this finding requires a more comprehensive study in identifying the relationship between visual tendency level and delivery strategy. The relationship of the tendency visual level can be detailed by dividing it into three levels of tendency, low visual tendency level (score 1-3), moderate visual tendency level (score 5-7) or high visual tendency level (score 9-11) and see the link between two different visual delivery strategies whether using static images or dynamic images for the instructional animation. This will surely give a better finding to serve as guideline in developing an effective delivery strategy among DEP students.

4. CONCLUSION

Student learning style tendency is seen to be able to help educators to bring to practice an effective delivery strategy in enhancing the effectiveness of the teaching and learning process. Learning style is one of the main factors that need to be accounted for in preparing teaching and learning delivery strategy especially in the preparation of instructional materials [21]. According to [22], learning style is a process that involves an individual receiving and processing of information. The right learning style, that is appropriate or caters to a course will give a positive effect to student's achievement [15]. Apart from that, learning style does not only involve the process of receiving the learning content but also it covers the selection of the delivery strategy for the content. For instance, the learning delivery strategy that uses images or diagrams to deliver the information, will certainly stimulate the mind of the individual, who has a strong tendency to take in that visual learning style. This will further facilitate the individual to build effective learning more easily [23].

The teaching delivery strategy that is consistent with student's learning style will help him or her increase their understanding and achievement [14]. Nonetheless, students who have the tendency towards a certain learning style will run into some difficulties if the delivery strategy is not harmonious with his or her learning style [22,24]. The learning outcome can be improved if active media technology designers (hypermedia) prepare different learning sequences and presentation materials that are appropriate to accommodate these different individual learning styles [25].

Based on the study finding, the mean score analysis shows that the visual tendency dimension and the sequential dimension are moderate. However, the verbal dimension is seen to be at a low mean range. This indirectly reflects that the respondents are more prone to adopt visual and sequential learning delivery strategy. In effect, they find it easier to process information from visual resources- in digital or printed forms. More comprehensive studies must be conducted on a larger number of respondents to obtain better data validity. It is proposed that future studies should focus on identifying the visual forms – static or animation- that can give a significant impact in the delivery strategy that will be developed.

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I-CReST 2022:142-118 - MySejahtera Application: Issues and Challenges from the Perspective of Privacy Rights

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ABSTRACT

The World Health Organization (WHO) declared that the virus of The Covid-19 was a Public Health Emergency of International Concern back on the 30th of January 2020. Due to that reason, the Government of Malaysia took a proactive approach by creating MySejahtera, a contact-tracing software that will aid the government in monitoring outbreaks and allowing the Ministry of Health to track the virus's spread. However, the technology has generated concerns about data privacy because the software requires various users' personal information to be submitted before it can be used. Thus, the objective of this paper will be on the government's breach of the rights to privacy from a legal standpoint. This research is qualitative in nature and relies on primary sources such as the Federal Constitution and legislation, as well as secondary sources such as published data, studies, research, and publications. Based on the findings, it is permissible for the government to acquire sensitive information from citizens in the case of a pandemic of Covid-19, because of public interest. This paper concludes that contact tracing apps are a necessary tool for combating breakouts despite privacy breaches and the authors further provide suggestions and solutions related to this issue.

Keywords: Covid-19; MySejahtera; breach of privacy; Personal Data Protection Act 2010; Malaysia

1. INTRODUCTION

Pandemic of Covid-19 outbreak began in Wuhan City, Hubei Province, China, in December 2019 and quickly spread throughout the world. As of June 23, 2022, a total of 541 million Covid-19 cases had been recorded worldwide, with 6.32 million of deaths. Due to that reason, the Government of Malaysia took a proactive approach by creating MySejahtera, a contact-tracing software for the purpose of monitoring and controlling the outbreak. The objective of this academic writing is to review, examine and analyse the data privacy protection of MySejahtera Apps for its user from legal and expert perspectives.

The main focus in this paper is the issue of whether the government can gather personal information from citizens during a pandemic and, if so, to what extent such information should be protected. This paper will also highlight on MySejahtera app's privacy concerns and legal challenges. This is due to the fact that the current privacy legislation, the Personal Data Protection Act 2010, does not apply to the government in the event of data leakage. In such a case, the government will not be held liable for its actions. Thus, there are also suggestions and recommendations from in order to settle this issue.

2. METHODOLOGY

This study was conducted only on a theological basis, with the goal of discovering, examining, analysing, and discussing whether the Malaysian government's trace app, MySejahtera, is safe for its users. It is qualitative in nature and relies on primary sources such as the Federal Constitution and legislation such as Personal Data Protection Act 2010, as well as secondary sources such as published data, studies, research, and publications. Every single source was thoroughly examined in order to arrive at an accurate and reliable conclusion. When doing this research, the following actions were taken:

- i. Reviewing public data, reports, studies, papers, and case studies on health, Covid-19, MySejahtera, location monitoring apps, and privacy breaches.
- ii. Examining and analysing the sources cited above.
- iii. Based on the results of the analysis, infer and reach conclusions.

3. FINDINGS AND DISCUSSION

3.1 Background of MySejahtera Application

Covid-19 has already become a worldwide pandemic, infecting over 200 nations since its initial breakout in December 2019. To combat its spread, public health officials have used a variety of measures, including quarantining, lockdowns, curfews, physical separation and the forced wearing of face masks. However, identifying those who have had intimate contact with sick people, followed by self-isolation (so-called contact tracing), has shown to be highly successful.

As a result, contact tracking has emerged as a critical method for mitigating the spread of Covid-19. In Malaysia, the contact tracking app is MySejahtera. MySejahtera is an application developed by the Malaysian government to assist in the management of Covid-19 outbreaks in the region. This app collects information with the user's consent and is done willingly through, but not limited to, the registration process, adding personal information, responding to health assessments, scanning a QR code to check in at the premises, and contacting app support by email or help desk form. The data that are currently asked from MySejahtera are mostly our personal data. For example, they asked for user registration such as name, address, identity card number/passport number, phone number, date of birth, email address and gender. It assists people in evaluating themselves and their families for self-assessment of well-being. Users can now track their health improvement during the Covid-19 outbreak.

The background of MySejahtera can be seen in FAQ Mysejahtera that can be accessed in https://mysejahtera.malaysia.gov.my/faq_en/ which includes question and answer related to that application. It is one of the method of Ministry of Health (MOH) in tracking user-health requirements and taking immediate action in order to control the Covid-19 outbreak.[4] One of the features in Mysejahtera is the QR code where it could trace our information whenever we go as it is to trace the Covid-19 viruses and prevent them from spreading [1]. A QR code is a barcode that encodes information as a sequence of pixels in a square-shaped grid and can be quickly read by a digital device. MySejahtera is carried out in collaborations with National Security Council (NSC), the Ministry of Health (MOH), the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), the Malaysian Communications

and Multimedia Commission (MCMC), and the Ministry of Science, Technology and Innovation (MOSTI). [5]

3.2 MySejahtera Issues

Since the establishment of the MySejahtera application by the Malaysian government, there are issues that need to be addressed with, especially related to privacy issues. The users of MySejahtera application might face issue about the safety of the privacy data information [2].

According to CyberSecurity Malaysia data 2020, 82.5 percent of cyber security instances increased during the Movement Control Order (MCO), with fraud, intrusion, and cyber harassment being the most common [3]. According to Verizon figures from 2020, 71 percent of cyber crime assaults involving two-factor authentication, bitcoin scams, credential theft, smishing, phishing, ransomware, fraud, and identity theft were financially motivated, while 28 percent involved malware [3]. With the rapid creation of mobile apps to track Covid-19 in the United States, Israel, South Korea, and China, there are an increase in cybercrime assaults on these mobile apps, internet applications, businesses and cybercriminal groups exploiting Covid-19 for nefarious purposes. Emotet Trojan successfully exploited the Covid-19 pandemic scenario in Japan in 2020 by impersonating a state welfare provider and spreading it through an infected Microsoft Word document. Trojan-Banker, AndroidOS, and Asacub in 2018 infected around 250,000 people over the world. AppleJeuS poses as a legal app and infects cryptocurrency dealers through the supply chain. The spyware infiltrated victims' phones through genuine mobile apps, which were then infected with malware. Even when Covid-19 ends, it is expected that these exploitations will continue [7].

Apart from that, research has been conducted regarding the safety of the Covid-19 trace app including MySejahtera. The outcome of the research showed that about 70% of the apps pose potential security risks due to employing cryptographic algorithms that are insecure or not part of best practice and storing sensitive information in clear text that could be potentially read by attackers [6]. It is also identified that mostly around 75% of the apps had contained at least one tracker, potentially causing serious privacy leakage which is a data leak that leads to exposing private information, to third parties.

In a nutshell, it can be seen that one of the challenges faced by the government is to ensure that the personal data being used is in safe hands even after the pandemic. Meanwhile now, those data are being used for the sake of preventing the spread of the virus. However, the government needs to ensure that all of the data is being used properly and there will be no breach of the data after the pandemic has ended and the citizens are no longer required to use the MySejahtera application.

3.3 Legal Position of Privacy Law in Malaysia

The importance of privacy is stated in the Article 12 of The Universal Declaration of Human Rights (UDHR), Article 17 of the International Covenant on Civil and Political Rights (ICCPR), Article 9 of the Universal Islamic Declaration of Human Rights (UIDHR), and other regional human rights documents recognise privacy as a qualified, essential human right [7].

In Malaysia, there are currently no explicit privacy laws that safeguard citizens' privacy. The right to privacy is likewise not clearly recognized in the Federal Constitution. The Personal Data Protection Act 2010 (PDPA 2010), which governs the processing of personal data in commercial transactions, is Malaysia's only privacy law. The PDPA 2010 is more concerned with personal data than with individual privacy. When dealing with the personal data of its employees, suppliers, and customers, the PDPA contains rules that allow data users to collect, process, and use personal data.

However, it is important to note that according to Section 3(1) of PDPA 2010, this Act does not apply to the federal or state governments. As a result, no action against the Malaysian government can be done in the event of data leaks. Despite not being subject to the PDPA, any officer-in-charge would be held accountable if data is misused or leaked and will be prosecuted under section 8(1)(iv) of the Official Secrets Act 1972 and under the Public Officers (Conduct and Discipline) Regulations 1993 [6]. As a result, while the PDPA's privacy protections are insufficient to assure accountability in the event of data breaches involving either the Federal or State governments, the government should be more transparent with data management. Even though the data processed will not be subject to the PDPA 2010, the right to privacy of individuals is still protected under the common law. [2]

Tracing and recording of the MySejahtera app also may infringe the citizens' private rights where the data might be misuse during the transit or at the point of final storage [2]. As a result, there is a risk of abuse or breach of data before it reaches its authorized storage. If there is a clear service level agreement in place that establishes specific obligations in relation to personal data in transit, this can be avoided or minimized. Third-party providers which are referred to as "data processors" in the PDPA 2010 are responsible for the data's integrity, security, and confidentiality. They should now treat the material as if it were confidential. There is also another type of data breach risk, which is data in ultimate storage.

Since Malaysia has begun using PDPA 2010 to secure individual data related to commercial or service transactions, the users have more control over their personal information under the PDPA 2010, which includes their full name, identification card (IC), photo, phone number, email, fingerprints, and home address. There is also a General Consumer Code of Practice (GCC) that was adopted on November 23, 2017, where it applies to licensed service providers in the communications sector. Authenticity, data security, data quality, and access to personal information are all data protection concepts. MySejahtera includes several security mechanisms and adheres to international standards to preserve the confidentiality and security of user information. Data is encrypted in transit and stored at rest on a server with advanced security protections [3].

4. RECOMMENDATION

As Malaysia is currently in the midst of a pandemic era, in which we are currently dealing with and fighting the third wave of Covid-19, it is impossible for us to avoid using the "MySejahtera" app, which has become the most mandatory app in every single citizen of Malaysia for contact tracing purposes. The programme must be downloaded and installed by any means required because it is the only means of preventing the spread of the enormous and devastating Coronavirus from one location to another, which is otherwise impossible. Hence, the primary issue is data leakage, which is being accessed by a third party.

As a result of this massive issue, there are some efficient and effective suggestions of preventing data from being leaked to third parties and ensuring that the data is only used for the purpose of preventing Covid-19. The government must ensure that all information gathered is solely for the purpose of supporting public health. Because this software incorporates functions that can monitor or guide someone's health, regardless of whether or not they are infected with Covid-19, health is the most important consideration. [2]

Next, the data collected can only be used throughout the epidemic and must be stored safely if the crisis continues for any length of time. Other than that, once the pandemic is finished, there must be a specific period of time during which all data must be erased. For example, when six months have passed since the crisis ended, all data will be fully wiped. Its purpose is to prevent any conceivable wrongful behaviour by the government, such as an unintentional or intentional release of data, which could result in a violation of the privacy of someone's personal information.

Furthermore, one of the great alternatives that the government might implement is to allow all of the users of "MySejahtera" to manually erase all of their data when it is no longer required. This method allows someone to make the decision to erase the data on his or her own, without being coerced, and if they choose to do so, it indicates that they have freely given their consent and that the government will not be held liable for any legal actions brought against them by the public.

Besides, the government can create public awareness of the safety and security of the data stored through the app, as well as the benefits of using the app to govern all of the Covid-19-related issues. This will increase the public's trust in the government because they will be able to see that this app provides more benefits than it does harm, and that it is solely for the purpose of preventing the Covid-19 and that there will be no mistakes or negative consequences to using it because otherwise the government will be held responsible for all of the issues that arise. [2]

Furthermore, there is a need to amend PDPA 2010 to cater some issues such as obligation to report data breach, the need of data protection officers, civil remedies for data subject, and issues involving international transfer of personal data [9].

5. CONCLUSION

All in all, we must exercise caution as responsible citizens since we have the choice to choose whether or not to provide our consent or authorization of personal information to anyone. In conclusion, we believe that MySejahtera is not a flawless app and the government should clarify to the public that the data is absolutely protected and legal action could be taken if it is successfully proven otherwise. [2] However, we come to the conclusion that this application is indeed necessary to help the Ministry of Health in controlling the spread of Covid-19.

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I-CReST 2022:142-119 - Right to Education: Education for Undocumented Children in Malaysia

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ABSTRACT

Rights to education is one of the most important issues when people talk about the fundamentals of human rights. However, the vast majority of the stateless children in Malaysia are being neglected their rights to education solely on the basis that they do not have legal documentation saying that they are a citizen. These children are supposed to be given the right to education in order for a country to grow forward and compete on the international stage. It has been reported by UNESCO that important improvements have been made ranging from Chad and Uganda to Lebanon and Turkey in regards to rights to education, especially for the children who do not have legal documentation or residence status, and it is time for Malaysia to follow suit. People do know that the citizens of Malaysia have been nourished by free education starting from primary school to secondary education. However, this privilege has not been applied to stateless children, it is worse that they have been rejected enrolment into public schools and alternative education is the only remedy for this problem. As such, the purpose of this paper is to identify, explain, and contextualize the various categories of undocumented children in Malaysia and their educational opportunities. This paper will highlight some of the big cases regarding the issue of stateless children being denied their right to education. Some recommendations also will be given for the government to consider in regard to this issue. This research is based on a doctrinal basis. It is qualitative in nature and uses published data, reports, research, articles, case laws, newspaper articles, and case studies as its sources. This paper concludes that the Malaysian policy is not yet enough to cure this cancerous problem even with the so-called “Zero Reject Policy”.

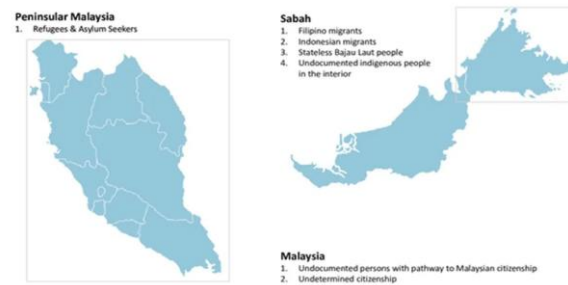
Keywords: Stateless children; right to education; tertiary education; alternative education

1. INTRODUCTION

Rights to Education is one of the most salient issues when we discuss the fundamentals of Human Rights. It is inevitable to assert explicitly that this right is necessary for democracy and human dignity to exist. Malaysia has faced a serious problem when it comes to distributing education for all especially undocumented children. The right of all children to compulsory education at the fundamental level is affirmed and stated explicitly in Article 26 of the Universal Declaration of Human Rights. Additionally, the Convention on the Rights of the Child (CRC) also highlighted the right of all children to education based on equal opportunities for them. Malaysia has ratified this convention, but it seems to be that it is not the panacea that we are looking for to curb this cancerous disease that we have encountered since forever. The “Zero Reject Policy” that has been enforced in 2019 also doesn't seem to be a remedy for this

issue. This is since the regulation has not been implemented uniformly across the country, with some schools refusing to enrol stateless students without proof of Malaysian citizenship. There are no crucial reservations made by Malaysian lawmakers as stated in Article 28 paragraph 1 (a) of the CRC which reads “Make primary education compulsory and available free to all”. This is because Malaysia applies the dualism theory which needs to be tabled in the parliament first before these convention’s provisions shall be made the law that is legally binding.

Fig 1. Different categories of undocumented and non-citizens children in Malaysia by location and legal identities.



Loganathan T, Chan ZX, Hassan F, Ong ZL, Majid HA (2022) Undocumented: An examination of legal identity and education provision for children in Malaysia. PLOS ONE 17(2): e0263404. <https://doi.org/10.1371/journal.pone.0263404>
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Figure 1: Different categories of undocumented and non-citizens children in Malaysia by location and legal identities. [10]

Figure 1 shows the different categories of undocumented children in Malaysia by location and their legal identities. It can be seen clearly see that Sabah is on top of the list when it comes to undocumented children as they have Filipino migrants, Indonesian migrants, Stateless Bajau Laut people, and undocumented indigenous people of Sabah. These undocumented children are also known as “invisible children”. [10] There are estimated to be at least 50,000 invisible children in Sabah according to the Asia Foundation and among the most vulnerable in Malaysia. What is even disturbing is that Malaysia is going nowhere in curbing these issues and worse, they condone this act of not giving them proper education. To depict this, according to Flora Yohanes who is a teacher at a makeshift school run by a Malaysian NGO, “the authorities often conduct checks and these children are constantly living in fear”. [2] They even skipped school for weeks just to avoid the police and they will attend school whenever they feel that it was safe. These children are attending rudimentary schools run by NGOs instead of government schools which have better systems and highly subsidised education. The other option for these children to have their education is by going to a private school which can be costly and unaffordable considering the remuneration received by their parents. They are supposed to be given equal opportunity for education to increase their competitiveness in school and indirectly producing better scholar in the future.

Malaysia is neither a signatory to the 1951 Refugee Convention or its 1967 Protocol, nor has it signed the 1954 Convention on the Status of Stateless Persons or the 1961 Convention on the Reduction of Statelessness. As a result, the immigration legislation makes no distinction between refugees, asylum seekers, irregular migrants, undocumented individuals, or stateless individuals, treating them as “illegal immigrants”. With that being said, they will surely be denied access to education, healthcare, et cetera.

2. RESEARCH METHODOLOGY

This research was conducted solely on a doctrinal basis with the objective of discovering, examining, and analysing the violation of the stateless children's rights to education. We used published data, reports, research, articles, case studies, case laws, and newspaper articles as our sources. Every single source was examined meticulously in order to publish this research. The following steps were taken when conducting this study are reading the published data, reports, research, and articles that are pertaining to the rights to education for stateless children in Malaysia. Apart from that, this process involve reviewing and analysing the aforementioned sources, deduced and drew inferences from the results of the analysis and make recommendations for initiatives and policies that will resolve the situation at hand.

3. RESEARCH FINDINGS

3.1 Who is a Stateless Person?

According to Article 1 of the 1954 Convention Relating to the Status of Stateless Persons that was provided by the United Nations High Commissioner for Refugees (UNHCR) the international legal definition for stateless persons is "persons who are not considered as nationals by any country under the operation of its law" [19]. This simply means that stateless persons are the persons who lack formal documentation and recognition from any country. The phrases 'stateless', 'undocumented', 'non-citizen', and 'migrant', are occasionally used interchangeably in Malaysia and those phrases can refer to a wide range of people and categories, including unregistered births, illegitimate children, children whose parents' citizenship status is unknown, refugees, Bajau Laut people, abandoned children and children of migrant workers [10]. Universal Declaration of Human Rights (UDHR) and Convention on the Rights of the Child (CRC) are some of the examples of the international regulations that are created to protect the human rights of people around the world. Regardless of the existence of international law to defend human rights, the phrase "statelessness" continues to have a significant impact on those people's ability to attain their rights in all aspects, particularly for children, who will govern the future of the world. This is because most of the legislation in Malaysia is designed to safeguard the human rights of official citizens with a formal identity, rather than stateless people.

3.2 The Impact of a Lack of Legitimate Documentation on Children in the Aspect of Education

Education is a basic fundamental human right and is considered one of the most important things for every human being to have as it will help to give people the chance at better lives. Many significant issues could be remedied by pursuing education, such as breaking the cycle of poverty and developing critical thinking abilities without formal education, children would be unable to learn essential skills for everyday living and acquire formal knowledge, leaving them with few opportunities to improve their lives in every aspect. Due to their parents' uncertain citizenship status, the children are indirectly considered illegitimate, which becomes the main source of discrimination against them in terms of their right to an education. The clearest evidence is related to this issue is where that undocumented children are being marginalized from receiving formal education because the majority of the public schools in Malaysia do not accept undocumented children [15].

The Convention on the Rights of the Child (CRC) reaffirms all children's right to an equal opportunity to receive an education regardless of citizenship status. The CRC has been ratified by Malaysia. Nonetheless, the government does not completely comply with Article 28 paragraph 1 (a) of the CRC, which states that state parties shall make elementary education compulsory and accessible to all, as the government excludes non-citizen children from the right to receive a formal education [10]. Regardless of the convention, Malaysia has adopted the dualism theory, which states that international provisions must be implemented by parliament in order to be legally binding within Malaysian law. Therefore, it is not illegal for Malaysia to refuse to fully implement the convention within the framework of Malaysian law. This Education Act 1966 has limited the rights to enrol in public schools and imposed compulsory primary school attendance only for Malaysian citizens where the context of Malaysian citizens is proposed to relate only to those possessing Malaysian citizenship with official identity, leaving the undocumented youngsters in this country out of the scope of this Act. To further illustrate this point, The Malaysian government has prohibited children without legal documentation from enrolling in government public schools since 2002, according to Section 130 of Act 550 of the Education Act 1996, for reasons unknown to the public at large [11].

Even having the Education Act of 1996 in place, stateless and undocumented children are still denied the right to an education due to a lack of legitimate documentation. Malaysia has implemented the Child Act 2001 that was adopted based on principles outlined in CRC. However, by reading the preamble of the Child Act of 2001, together with the clauses mentioned, it concludes the aspects of equality that Malaysian legislation considered for all children in Malaysia to receive an education without discrimination only applied to Malaysian citizens.

In 2013, the Malaysian government came out with a new initiative to help stateless children to receive formal education by establishing Sekolah Bimbingan Jalinan Kasih (SBJK). The purpose of this institution is to provide free and formal education for those abandoned and street children as well as the orphans who live in certified childcare institutions and do not have legitimate identification [12]. However, one of the prerequisites for enrolment is that the students must have at least one Malaysian citizen parent. Aside from that, the Malaysian Ministry of Education also has launched a project called "Zero Reject Policy" in 2019 with the same goal as the SBJK: to help undocumented children to receive their rights to education in public school. Nevertheless, only certain undocumented children are eligible for this benefit, including illegitimate children with at least one Malaysian citizen parent, non-citizen children adopted by Malaysian parents, and children with no Malaysian citizen parents, with a few exceptions, including parents who are foreign embassy staff, parents who work at a government department with a valid permit and parents who are permanent residents in Malaysia [10]. Clearly, even with both of these measures, there are still many undocumented children in Malaysia who are unable to receive formal education due to a specific condition that they are unable to achieve, leaving them to endure continuous discrimination against their right to education throughout their lives.

In Malaysia, it is legally obligated for every kid to complete primary school education, as stated in Article 12 of the Federal Constitution, which states that there shall be no discrimination against any citizen and ensures the right to education for all citizens. However, as previously indicated, all of the education regulations that apply in the Malaysian legal framework do not encompass or protect non-citizens. To get basic elementary education,

undocumented children could only depend on Alternative Learning Centers (ALC) run by agencies like non-governmental organizations (NGOs) [17]. Dignity for Children Foundation, SUKA Society, and Borneo Komrad are a few examples of NGOs that provide free education not only for poor children but also for all other children that could not receive any proper education such as stateless and undocumented children. These organizations provide a large opportunity for those youngsters to develop their talents and obtain basic education up to the secondary level, with convenient and comprehensive facilities for them to enjoy growing up with a decent education. However, the assistance of NGOs only is insufficient because the total number of stateless children in Malaysia is excessive. Estimating the actual number of undocumented children in Malaysia is quite impossible as their nature is to live behind the shadows. Nevertheless, in 2016, Malaysia's previous home minister, Ahmad Zahid Hamidi, claimed that there are approximately 290,000 undocumented children in the country. The Human Rights Commission of Malaysia (SUHAKAM), an independent human rights organization, submitted a scheme to the government in 2015 to build twelve ALC as a way to support undocumented children in conjunction with UNICEF. The proposal, however, was rejected as it seemed impractical in Malaysia due to the lack of formal verification and validation [15]. Despite this, since the government has yet to legally adopt such laws and legislation dealing with stateless children in Malaysia, NGOs keep trying to provide the best proper education for undocumented children to this day.

3.3 Education for Undocumented Children in Malaysia: A Legal Framework Proposal

The Child Rights Coalition Malaysia, in a report for the Universal Periodic Review, has pointed out that clear access to quality education by those from disadvantaged communities is still being affiliated with worrying challenges. It is undeniable that the rights of certified citizens should be prioritized but access to education for undocumented children is a matter of humanity rather than the sovereignty of a country. Malaysian children without birth certificates can attend government-run schools if they can acquire certification from the Department of Social Welfare or their village headmen that they were born in Malaysia, according to a 2009 government announcement. However, it is claimed that few people are aware of this legislation, and no exemption has been provided for youngsters to take formal exams.

The United Nations Committee on the Rights of the Child has stated that states should ensure that all children affected by migration have equal access to economic, social, and cultural rights, as well as essential services, regardless of their or their parent's migration status, by enshrining their rights in law. States are strongly encouraged to reform legislation, policies, and practices that prevent or discriminate against children and their families affected by migration, especially those in an irregular situation, from effectively accessing services and benefits such as health care, education, long-term social security, and social assistance.

Malaysia should be taking an example from the urge of the European Council to its member states to implement effective measures to ensure equal access to quality education, housing, health, and protection services for all children. Amendments of Law across the European Union that can be taken as clear examples for Malaysia to enact its own legislation against this issue include France, in Article 26 of the Decree on basic Education, which enforces equal opportunities in education. The law in France provides that school bursaries for poor students attending secondary schools and colleges are available to all students, regardless of nationality or family residence status. Regardless of whether pupils have a residence permit

or identity documents, the right to education in Italy includes acquiring formal acknowledgment of education and the final school-leaving qualification. Meanwhile, undocumented children in Spain have legal access to subsidies and grants, which are critical for many undocumented children to cover extracurricular school expenses, such as uniforms, books, transportation, and food.

3.4 Access to Tertiary Education for Undocumented Children in Malaysia

The fact that undocumented children have trouble continuing their tertiary education is still unclear and ambiguous. The fact that our country's laws and regulations do not place a strong priority on tertiary education for this group of undocumented children, this is the case where the roots of this issue need to be investigated. This paper found the main factor of the difficulty to pursue their higher education is that these undocumented children do not have any citizenship or nationality from any country, especially Malaysia. Therefore, there is a case law that can be referred to so that it may be seen how challenging it is for this group of undocumented children to gain citizenship in Malaysia.

3.5 Case Law: Lim Jen Hsian & Anor v Ketua Pengarah Jabatan Pendaftaran Negara & Ors [2018] 6 MLJ 548

The case law that this paper wants to emphasise here is the case of Lim Jen Hsian & Anor v Ketua Pengarah Jabatan Pendaftaran Negara & Ors. The fact of the case is that a child was born to a Malaysian father & a Thailand mother out of wedlock. In order to apply for Malaysian citizenship to the second appellant, who is the child, the first appellant relied on the ground that the child is a Malaysian citizen by operation of law by virtue of his birth in Malaysia pursuant to Article 14(1)(b) read with Section 1(e) of Second Schedule of the Federal Constitution. Paragraph (e) of section 1 of Part II of the Second Schedule said that "every person born within the Federation who is not born a citizen of any country otherwise than under this paragraph." The constitutional issues that arise from this relevant case are first, whether the appellants have fulfilled the requirements to obtain citizenship by operation of law as stipulated by Article 14 (1) (b) of the Federal Constitution. Second, whether the issue in this judicial review application is nonjusticiable under Part III, Second Schedule of the Federal Constitution.

In this case, the appellant wanted to affirm that his second applicant's citizenship shall be recognized under Article 15(A) of the Federal Constitution. He further contended that there is no dispute that documentary evidence confirms that the second appellant was born after Merdeka Day in the Federation i.e., on 6 October 2010 in Hospital Tung Shin, Kuala Lumpur, Malaysia thus fulfilling the requirement of *jus soli* in Article 14(1)(b) of the Federal Constitution. On the other hand, the side of the respondents argues that the High Court has no jurisdiction to review the decision of the respondents under Part III of the Federal Constitution because the decision of the government on citizenship is unjustifiable. Part III of the Second Schedule states that the duties of the Federal Government under this Part shall be exercised from time to time by the Minister of that State as directed by Yang di-Pertuan Agong, and the second section specifies that any decision taken under this Part by the Federal Government shall not be subject to appeal or review by any court.

As a result, the court found that the second appellant failed to satisfy the requirements stipulated in paragraph (e) of section 1 of Part II, Second Schedule of the Federal Constitution, to obtain citizenship by operation of law. The court dismissed the appeal and affirmed the

decision of the learned High Court judge. However, in this case, the child follows the nationality of his birth mother thus, this child is not considered stateless. Therefore, in the instant case, the child is recognized as a foreigner. Applying the case law to the discussion in the paper regarding the education for undocumented children, it can be summarized that every people especially the child needs to go through a lengthy and rigorous procedure for him/her to gain Malaysian nationality. The right to a nationality is important because nationality brings individuals under the political and legal protection of the state [20]. Citizenship is crucial for these undocumented children to be acknowledged by society and to be accorded the same rights as other children, including the right to access higher education.

3.6 Media Coverage on the Admission of Undocumented Students in Tertiary Education

Despite the fact that there are a large number of undocumented children in Malaysia, the struggle for tertiary education is rarely covered in the media [6]. However, even though a large number of them have completed their secondary education and have passed the Sijil Pelajaran Malaysia with flying colours, their future is uncertain [6]. They were unable to continue their higher studies because they lacked a valid identification card to show.

The story of a stateless child named Roisah Abdullah was making the rounds on the news [7]. Roisah was recognized as the top student in her school's Sijil Tinggi Pelajaran Malaysia (STPM) program. Despite her accomplishments, she does not receive any offers to continue her education because of her position as a stateless person. In Klang, she was born to a foreigner's mother and an unknown father, and she was later adopted by a couple who lived in the city. Her adoptive parents have been fighting for her Malaysian citizenship since she was born, but have so far been unsuccessful. Later, Roisah was fortunate enough to earn a scholarship from Universiti Tun Abdul Razak, and she was guaranteed a spot at Universiti Utara Malaysia by the former Minister of Higher Education, Datuk Seri Idris Jusoh [1]. She even received a scholarship at the University of Reading in Malaysia after the university's administration learned of her experience. Housing and Local Government Minister Zuraida Kamaruddin has approved Roisah's citizenship application. Roisah is currently pursuing a Bachelor of Accounting degree at Universiti Tun Abdul Razak and has gotten an approval letter for her citizenship application [8].

In contrast, there is another story of an undocumented child called Wong Man Ling. In 2019, The Star released an article reporting the struggle of a girl named Wong Man Ling, born out of wedlock by a Malaysian father and Cambodian mother who had since gone missing [6]. She was able to earn a perfect score on her SPM which is 10A s. However, because of her citizenship status, she was unable to apply for her dream course in dentistry at University Malaya [4]. Her parents are unable to afford to send her to a private university, so she is left with no alternative except to hope for the best and hope for a miracle.

In a nutshell, it can be seen from these two stories of stateless and undocumented children that when Rosiah's case was widely reported in the media, universities such as Universiti Tun Abdul Razak and the University of Reading, Malaysia, expressed their concern, whereas Wong's case received little attention from various parties, including the minister of education himself. It can also be deduced from this point that the problem of undocumented students' access to tertiary education should be made more generally known, particularly to powerful authorities. This is necessary for their educational path to be conducted smoothly, as we saw in Rosiah's situation above. Without the recognition of the media or any high influence

authorities, their efforts and hard work might be useless. Even if they did their best in high school, these undocumented students still need our help so that they can continue their studies to tertiary education because their excellent results cannot guarantee anything without any proper documentation about themselves. This paper believes that there are many incentives that we can take to decrease the level of undocumented students unable to access higher education without having to go to an international higher institution or getting into public universities as an international student as it will cost a fortune. Hence, it cannot be denied that it is really hard for undocumented children to have access to tertiary education.

4. RECOMMENDATION

The research has led to some recommendations that may assist address the problem of undocumented students in the educational sector. An Alternative Education Program is one suggestion. Alternative education must be made available to children from undocumented and stateless communities if official schooling becomes inaccessible or unattainable. Alternative education is a platform where learning activities can be conducted outside of the official education framework [13]. Alternative education can be used to fill a gap in the curriculum offered to certain target groups. It can also be used to bridge the gap between children who are easily integrated into the existing formal education system and those who are stateless due to the host factor. To further explain the Alternative Education Program, this program provides undocumented children with the necessary educational opportunities and access by establishing a foundation in literacy and numeracy skills, utilizing flexible methodologies, increasing global citizenship awareness, and instilling lifelong learning skills such as life skills and civic responsibility. However, the Alternative Education Program does not appear to be a substantial component of Malaysia's educational system. Unlike Thailand or Indonesia, Malaysia has yet to accept the Alternative Education Program as a type of formal education on a par with other forms of formal education. The Alternative Education Program's introduction will create chances for undocumented and stateless individuals.

This report also recommends adopting a new law to protect undocumented children's rights in Malaysia, especially their access to education. Due to its legal recognition of stateless persons and children within its region, Laos is a great role model for us in enacting new laws respecting stateless people's rights. According to Article 7 of the Lao Nationality Law of 2004, a stateless person is "an individual residing in Lao People's Democratic Republic territory who is not a Lao citizen and cannot confirm his nationality". This definition clearly acknowledges a stateless person as one who lives in Laos. The term is useful since it refers to people who cannot prove their nationality. Using Laos as an example, Malaysia can adopt a new law such as the 'Malaysian Nationality Act 2022' to legally recognise undocumented children living in Malaysia. This legal recognition will help this community to gain the same Malaysian privileges as other Malaysian citizens. It is notable because it prevents statelessness among Malaysian children. But the law must be stringent and strict to ensure loyal compliance. The stateless individual or parent must meet all requirements set forth in the Act in order to be granted Malaysian nationality. The determination of nationality of an undocumented person or parent is also subject to permission by the court, which meets annually to set a quota for the stateless to take advantage of this option. Entrusting their children's rights to a stateless parent is risky. If the parents do not obtain citizenship, their children will be denied citizenship and other rights such as health care and education.

In short, undocumented children represent a minority group that has been neglected for decades, and education is the way to reducing poverty and improving quality of life. To improve education quality, all development initiatives should be based on education quality criteria. They need to feel cared for or they will feel neglected. The stateless community needs Malaysians to help them overcome the myriad barriers they encounter and make the world a better place.

5. CONCLUSION

After all, being stateless in a country is equivalent to being invisible, as these undocumented children are kept concealed from society. The law and provisions provided in the Malaysian legal system show that they only protect the rights of education for official Malaysian citizens despite having undocumented and stateless children in this country. Even having international laws in place to protect human rights is insufficient because our own government, which employs dualism theory, must fully interpret international law into our provisions to ensure that the laws can be used to protect the rights of all citizens in this country, regardless of citizenship. The Malaysian government's initiative to enable non-citizen children to acquire formal education is undoubtedly beneficial. Nonetheless, not all stateless children are eligible for benefits and hence remain helpless. No child is born with the power to pick their family, and even stateless children would prefer to have a proper family if they could. Therefore, the Malaysian government really should reconsider its policy toward the stateless community in order to ensure that they deserve the same rights as other citizens, particularly in terms of education, because education is the most significant factor that enables them to grow and improve their lives.

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I-CReST 2022:146-122 - An Analysis of #KerajaanGagal in Calling Out for Social Justice Among Twitter Users: A Look into Government's Act in Managing Flood Disaster

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ABSTRACT

Flooding occurs on a regular basis in Malaysia, and even the home roof was not safe enough to cling to as the water level approached the unfortunate victims. In some areas, one hour of rain is enough for flash floods to destroy property and disrupt Malaysians' lives. This annual occurrence of floods has dramatically impacted the lives of humans, but surprisingly, the government is still taking slow action to deal with such a disaster. Due to Malaysians' growing dissatisfaction with the government's slow flood response, the use of the #KerajaanGagal hashtag as a virtual call for social justice and a form of social movement to raise social awareness has become common in today's digital era, where netizens have become more social media savvy. The public has taken to Twitter to express their dissatisfaction with the government's passivity and incompetence in dealing with the flash floods, using the iconic #KerajaanGagal hashtag. The researcher will look at two analyses (a) What are the implications of the hashtag #KerajaanGagal with the act of the government in managing the flood disaster? (b) How the Twitter users utilize the hashtag #KerajaanGagal to help the flood victims? The methodology employed is qualitative, incorporating content analysis techniques. From December 2021 to June 2022, the author analysed the most viral tweets with the hashtag #KerajaanGagal related to flood disasters from Twitter users' accounts. The researcher categorized 10 tweets with the hashtag #KerajaanGagal related to the flood crisis that went viral with over 1000 retweets among Twitter users. All tweets with the indicated hashtag were analyzed from the selected samples. Apart from the hashtag campaign becoming increasingly harmful as public dissatisfaction grew as a result of the government's poor handling of such issues; the findings revealed that there were numerous significant and proactive welfare movements as a result of the use of the hashtag #KerajaanGagal, which enabled Malaysians to help the less fortunate affected by the flood by providing food aid and other assistance. As a result, blaming our government for failing to address this issue and perpetuating the hashtag "#KerajaanGagal" does not do our government's efforts justice. While there is room for improvement, all that is required is prompt action by high-level officials to address such issues responsibly.

Keywords: Twitter; Twitter users; hashtag; content analysis

1. INTRODUCTION

Imagined being stranded on the roof for almost 12 hours where the victims were just sitting ducks as they watched each other hugging while giggling due to the cold, on the opposite house there's a paralyzed man was stuck in a house with rising water around him, a woman and her child on the boot of a stranded car waiting to be rescued from flood waters around her, and water gushing into the basement of a condominium to submerge vehicles. These were some of the images shared on Malaysian social media in the past three days as heavy rain pummelled most of Peninsular Malaysia (Hassan, 2021). That day was the day of 18 December 2021 which marked one of the worst floods in Malaysian history (The Sun Daily, 2021). The devastation seemed unreal for many Malaysians sharing the videos and pictures, as these involve urban Selangor and the capital city Kuala Lumpur, and not rural Kelantan, Terengganu, and eastern Johor, as annually seen during the year-end monsoon season.

Knowing that great power comes with huge responsibility and glory for the Malaysia government, however, who would have known that a day before the Malaysian worst flood in history, several signs has been issued by the Malaysian Meteorological Department with an orange alert for inclement weather in Kelantan and Terengganu as a first warned, but most believed that this was the usual annual end-of-year monsoon event which often severely affects the east coast states. However, on the next day with the blinks of an eye, the world witnessed a Tropical Depression that took an unexpected turn and dumped unprecedented volumes of rainfall onto the west coast of Peninsular Malaysia although those has been issued an amber alert by Malaysian Meteorological Department which then swiftly rose to a red alert that shows the highest level for the Klang Valley, Selangor, and neighboring states (The Sun Daily, 2021).

This annual occurrence of floods is a yearly event that has dramatically impacted the lives of humans, but surprisingly there is still slow action from the government to handle such a disaster. According to The Sun Daily (2021), it stated that the water minister blamed the public for not taking seriously the heavy rainfall warning issued by Meteorological Department. But what did he and his ministry do with the warning? What were the results of simulation modeling using the expensive software and supercomputers for weather and floods? Due to the frustration growing in Malaysian over the government's slow flood response, the use of the #KerajaanGagal hashtag as a virtual call out for social justice and a form of a social movement to raise social awareness has become prevalent in today's digital era where netizens have become more social media savvy. The public has taken to Twitter to express disappointment with the iconic #KerajaanGagal hashtag over the government's passivity and incompetency in tackling the flash floods.

Thus, the issue that needs to be addressed in this paper is that the disaster has highlighted the government's failure to use digital platforms for communication and rescue. This study might fill a void by investigating how criticism hashtags such as #KerajaanGagal have galvanized Malaysians to lend support to one another and rally for much-needed assistance during such a crisis. As a result, in order to find potential answers in this study, the researcher will use qualitative and content analysis techniques. The researcher proposes two research objectives:

- RO1: To explore what are the implications of the hashtag #KerajaanGagal with the act of the government in managing the flood disaster.
- RO2: To understand how the Twitter users utilize the hashtag #KerajaanGagal to help the flood victims.

An overview of some previous literature discusses which has provided insight into two areas of interest in this study for the literature review. The debate on An Analysis of #KerajaanGagal in Calling Out for Social Justice Among Twitter Users: A Look into Government's Act in Managing Flood Disaster, which is currently escalating, examines previous studies related to the implications of hashtags on Twitter and the consumptions of hashtag activism on Twitter for social welfare. Pauline and Rosli, (2021) explained in their previous study, Hashtag Campaign During Covid-19 Pandemic in Malaysia: Moving from online to offline, the use of hashtags enables online communities to form around specific concerns or causes and serves as a means of communication. When they are mediated online, "ad hoc" or "intimate publics" that revolve around hashtags may arise. Therefore, hashtag activism is the "discursive protest on social media united through a hashtagged word, phrase, or sentence" where hashtags are used to draw attention to concerns and enlist support for a cause. However, the problem addressed by the previous researcher was that various studies have begun to question whether online activism has been effective in promoting long-term offline action, which is still being debated. However, a study on street protests in Malaysia conducted by Bersih (Coalition for Clean and Fair Elections) discovered that its online campaigns, using the hashtags #bersih and #bersihstories, shaped "new discourses of identity and belonging." Bogen (2022) highlighted that there must be an understanding of how digital social movements live, evolve, and are engaged within the digital arena before a structure can be created to further the effectiveness of digital social movements. In findings, through analysis of the hashtag on Twitter, the study provides an illustration of the way that a digital social movement can use a hashtag as a way of advancement for its cause. Hence, through the previous research, the researcher was inspired to do this study knowing that the researcher could do something to understand the situation and explore its application of it.

2. MATERIAL AND METHODS

The researcher employed qualitative research techniques by upholding thematic analysis as the process of identifying patterns or themes within qualitative data. Thematic analysis is an appropriate and powerful method to use when seeking to understand a set of experiences, thoughts, or behaviors across a data set. Thus, according to Maguire & Delahunt, (2017) using thematic analysis, it is a powerful yet flexible method for analyzing qualitative data that can be used to shed a light on the objectives of this study. Given the flexibility of thematic analysis, the researcher will undergo a six-step process which is familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. All the data will be collected by searching the hashtag on the trending column on Twitter which is a big data system that curates and analyzes conversations that are getting most trendy among Twitter users. The author will analyze most viral tweets with the hashtag #KerajaanGagal related to flood disasters from the Twitter users' accounts from December 2021 until June 2022. It is because the end of 2021 was marked by disaster for Malaysians, the use of the hashtag #KerajaanGagal was spiked around that time the first reported death due to the floods was made. Data from ISEAS show that in total, there were 242,000 Twitter users who mentioned #KerajaanGagal 1.42 million times, thus potentially reaching some 54.7 million viewers (Pauline & Rosli, 2021). Therefore, the researcher will

categorize 10 tweets among Twitter users with the hashtag #KerajaanGagal related to the flood crisis that went viral with over 1000 retweets. From the selected samples, all tweets using the indicated hashtag will be analyzed.

3. RESULTS

Three themes emerged in the data, which are (i) *Poor Management* (the Government's act in managing the flood disaster) with a percentage of 30% (ii) *Uncertainty* (uncertainty about safety), with a percentage of 30% and the major theme would be (iii) *Problem Solving* (fast problem solving made by Malaysian citizen) with a percentage of 40%.

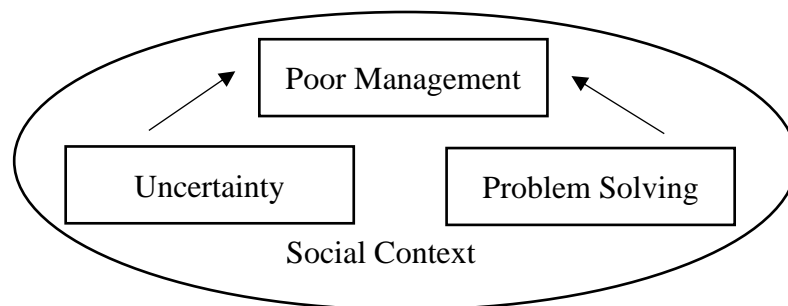


Figure 1: A summarization of the results

Table1: Example tweets by theme that represent the results

NO.	THEME	DESCRIPTION	EXAMPLE TWEETS
1	Poor Management	Express disappointment towards Government's slow act in managing the flood disaster	<p>(1) Listen to the stories of students affected by the floods, they didn't help, ready to ask them to fill out the form if they want help. But you can also spend money on dancing. Near section 16 of the event, even though the area was badly flooded @IsmailSabri60 @Khairykj #KerajaanGagal #gagal (2) We need to build accountability practices. KL residents have had to face major floods at least 3 times in the last 6 months. Please retweet if you agree the Minister in charge must resign #KerajaanGagal</p> <p>(3) This was in july yb @n_izzah dah remind and warn the gov to be prepared #KerajaanGagal #daruratbanjir</p>
2	Uncertainty	Describe their uncertainty about the safety of the flood victims	<p>(1) This is just a story from a family. Imagine another family. Imagine they were afraid for their own safety, the safety of his wife, mother, children. Can only surrender to God Sadly, everything is gone, drifted due to floods, due to management, due to logging due to #KerajaanGagal</p> <p>(2) #KerajaanGagal #DaruratBanjir Surau Al-Munir Taman Sri Nanding, Hulu Langat from night to morning but still didn't get any help. They need help, there's a disabled people here and, the baby is all cold.</p> <p>(3) Now that I'm going viral can someone answer me this. When,oh when, we are getting a photo of @IsmailSabri60 in a scuba suit pretending to go save</p>

			lives? I'd also accept pictures of the detestable @AzminAli or than Harun lady in heel. #KerajaanGagal
3	Problem Solving	Share fast problem solving made by Malaysian citizen	(1) #KerajaanGagal #DaruratBanjir Heartwarming to see Malaysian are offering their homes for temporary shelter to those who affected with flood. Once again, #RakyatJagaRakyat (2) Kpop stans all around MY, I know we have the biggest influences in social media, pls help spread this and other insightful information about our flood victims #DaruratBanjir #KerajaanGagal (3) Hi everyone. I understand everyone in Sri Muda needs help. We're trying our best but the currents and water levels are not forgiving. We need to keep everyone safe too. Please be patient. This is from the team currently wading through waters. #KerajaanGagal (4) Hi My Friend is near the Section 7 Shah Alam surau. Yall can go here if stranded nearby !! #DaruratBanjir #KerajaanGagal

4. DISCUSSIONS

The current study demonstrates how effective crisis communication is a critical component of the strategic response to the flood disaster, as this study demonstrates how criticism hashtags such as #KerajaanGagal have galvanized Malaysians to lend support to one another and rally for much-needed assistance during such a crisis. Social media is now a common medium for individuals to advocate for social justice and a type of social movement to raise such social awareness. The current study adds to a growing body of literature examining the characteristics of social media, specifically Twitter disclosures of the use of the hashtag #KerajaanGagal, which encompasses a wide range of experiences during such crises. This analysis focused on tweets that described how the hashtag was used in relation to the government's actions in dealing with flood disasters. Given the limited length of tweets (140 or 280 characters), the content included is likely to be relevant to how the Twitter user uses the hashtag.

According to the findings, the implications of the hashtag #KerajaanGagal with the government's actions in managing the flood disaster had three emerging overarching themes in the data referred to in Table 1, which include (i) Poor Management (Government's act in managing the flood disaster) (ii) Uncertainty (uncertainty about the safety) (iii) Problem Solving (fast problem solving made by Malaysian citizen). Thus, this can also be supported by Muthiah (2021) stated that there are massive floods in Shah Alam and Klang appears to have caught authorities by surprise, with many Malaysians lamenting the lack of immediate aid provided to victims who are uncertain and needs a fast problem solving during a disaster. therefore in the findings, the first theme emerged as poor management, in which users shared specific actions taken by the government during the crisis that appeared incompetent. As a result, the public has taken to Twitter with the iconic #KerajaanGagal hashtag to express their displeasure with the government's passivity and incompetence in dealing with the flash floods. For instance, one user shared, "Listen to the stories of students affected by the floods, they didn't help, ready to ask them to fill out the form if they want help. But you can also spend money on dancing. Near section 16 of the event, even though the area was badly flooded @IsmailSabri60 @Khairykj #KerajaanGagal #gagal".

The theme was characterized by the coding of poor management, where it is the government's insufficient response that has been shared via the hashtag #KerajaanGagal, as highlighted by a Twitter user in sharing their experience that emphasized the government's slow response that did not meet their needs during a crisis. As previously stated by Pauline and Rosli (2021), hashtag campaigns on social media enable users to express their sentiments on various issues and mobilize people to be part of a movement or cause; they have been used effectively by disenfranchised members of society against powerful elites. Therefore, hashtag campaigns like #KerajaanGagal became increasingly negative as public dissatisfaction grew as a result of the government's poor handling of the pandemic Covid-19 and the December 2021 flood disaster. Subsequently, the association of the hashtag #KerajaanGagal with the government's response to the flood disaster highlighted the government's poor management, which should serve as a wake-up call to the government at the federal, state, and political levels.

The second theme of the hashtag #KerajaanGagal's association with the government's response to the flood disaster is uncertainty. The Twitter user described their experiences with this hashtag as a result of their concern for the flood victims' safety. One user, for example, expresses their scepticism by tweeting, "This is just a family story. Imagine another family. Imagine their concern for their own safety as well as the safety of his wife, mother, and children. "Can only surrender to God", "Sadly, everything is gone, drifted due to floods", "due to management", "due to logging", "due to #KerajaanGagal". These tweets addressed the situation of flood victims, who were mostly using the #KerajaanGagal as SOS alerts, as stated by one tweet. Other tweeted "#KerajaanGagal". "#DaruratBanjir Surau Al-Munir Taman Sri Nanding, Hulu Langat from night to morning but still didn't get any help", "#They need help", "#There's a disabled person here and, the baby is all cold". Although much of the conversation using this hashtag focused on flood victim narratives, most Twitter user advocates noted that the hashtag #KerajaanGagal was used because it was sensational and trended on Twitter around the time the first reported death due to the floods was made (Khor, 2022). Inevitably, the association of the hashtag #KerajaanGagal with the government's response to the flood disaster highlighted the uncertainty about the safety of flood victims, allowing for a better understanding of the issue and assisting the government in better planning and mitigating some solutions to assist flood victims.

Finally, the third theme of the hashtag #KerajaanGagal's association with the government's response to the flood disaster is problem-solving. The Twitter user uses this hashtag to share Malaysian citizens' quick problem-solving. For instance, one tweet shared "Hi My Friend is near the Section 7 Shah Alam surau. Yall can go here if stranded nearby !! #DaruratBanjir #KerajaanGagal". People can use this hashtag to coordinate rescue efforts on Twitter. The growth of Twitter has provided an excellent opportunity to track concerns in order to provide a more complete picture of a disaster. As a result, this study demonstrates that hashtags provide valuable data for investigating people's concerns during natural disasters. This study can help policymakers and disaster risk management experts develop a better strategy for tracking down victims and responding to them in times of need by utilizing hashtags on Twitter. Thus, it can be supported by Chan, (2012) stated that through present studies, there are multiple policy recommendations for reforms at the national level and explores the prospects for a regional cooperation framework in disaster management.

On how, the Twitter users utilize the hashtag #KerajaanGagal to help the flood victims, the finding found out that the main theme is (iii) Problem-Solving was the biggest topic that has been discussed on Twitter with the hashtag of #KerajaanGagal during the time stamp. For

example, one tweet has managed to gather the highest retweets which are 2,279 RTs by utilizing the hashtag stated that “Kpop stans all around MY, I know we have the biggest influences in social media, pls help spread this and other insightful information about our flood victims #DaruratBanjir #KerajaanGagal”. The hashtag has been invaluable in assisting NGOs in mobilising resources and channeling their aid directly to those most affected by floods. Thus, it can be supported by Mezzana & Quinti (2017) stated that we shall now try to identify some benefits and potentialities of the hashtags on Twitter to crisis mapping at large during crisis. It is because many Malaysians on Twitter shared details of trapped victims in the hope that rescue teams would hear them. Not only that, but through the trending hashtag, ordinary citizens have stepped up with offers of vehicle loans, food, volunteering, and even animal shelter.

Overall, this study has revealed one significant implication of the hashtag #KerajaanGagal and how Twitter users use the hashtag #KerajaanGagal, which is a negative hashtag such as #KerajaanGagal, has galvanised Twitter users to request assistance, provide direction for aid distributions, and follow the developments as they unfold. Indeed, as a result of the #KerajaanGagal hashtag, a few new inspirational and unifying hashtags such as #DaruratBanjir, #RakyatJagaRakyat, and #kitajagakita were created. Although the type of hashtags is critical to social media success communication, it may be useful to conclude the current study with a brief review of best practises for using hashtags to advocate messages. Furthermore, the findings show that this study aids situational awareness in some ways. The emerging theme paints a larger picture of poor management and public concerns. As a result, the big picture can help the government access relevant real-time data from hashtags during natural disasters as another way to ensure safety, reduce damage, and social effects that can be summed up as problem-solving.

5. RECOMMENDATION FOR EXPERIMENTATION

The findings of this study have implications for social work practice. Tweets with sector-spanning hashtags will be retweeted and noticed by a government that aspires to excel in its advocacy messages during a disaster on Twitter. Similarly, hashtags that educate the public, communicate key government values and goals, and engage the audience in action or dialogue are more likely to be shared. Thus, Reen (2018) stated in their article 5 Tips for Using Twitter During Emergencies and Natural Disasters that research has shown that Twitter and other social media platforms can help track natural disasters in real-time and alert first responders to areas that require immediate assistance. In several countries in Asia, Twitter and Twitter Lite are important tools for people to communicate with each other, access critical information, and organize relief efforts in times of crisis (Acar & Muraki, 2011). When communication services are limited, hashtag on Twitter is where government agencies, relief organizations, media, volunteers, and citizens go to communicate and collaborate fast. Moreover, this research also shows that #KerajaanGagal helps the government, media, and Twitter users in developing Public Service Announcements (PSA) and unveiling public opinions.

In terms of future directions, it is advised to reduce the impact of noise and misinformation while also analyzing positive and neutral tweets. The researcher's approach may be limited by the fact that the Twitter searching tool does not usually detect emotions, misspellings, colloquialisms, foreign words, sarcasm, and abbreviations. Another limitation concerns tweets that contain incorrect or inaccurate information, as well as spam. As a result, we assumed that the massive number of tweets in a disaster drowns out noise. While the researcher believes that the noises have no significant impact on the results, we will employ some strategies to mitigate

the potential effects of the noises. To avoid spam, the first approach is to remove retweets and tweets containing URLs. The second method involves detecting unrelated or incorrect topics and then removing tweets whose primary topic is one of the irrelevant or incorrect topics. The primary topic is the one with the highest likelihood of being tweeted. The next approach is that we only collected significant tweets that have received more than 1000 RTs to be considered valid. However, we believe that the future plan will address these limitations in order to provide better data and new insights for future studies.

6. CONCLUSION

During the Covid-19 pandemic and unprecedented flood disaster in Malaysia, the hashtag #KerajaanGagal became the buzzword. Overall, the public has painted a clear picture of the government's lack of trust. Given the disastrous way officials responded during and after the floods, including attempts to censor tweets critical of the government, people are wondering how the government will regain Malaysians' trust. However, as public dissatisfaction with the government's handling of such issues grew, there were numerous significant and proactive welfare movements as a result of the use of the hashtag #KerajaanGagal, which enabled Malaysians to help the less fortunate affected by the flood by rendering aid and other assistance. Hence, blaming our government for failing to address this issue and perpetuating the use of the hashtag "#KerajaanGagal" does not do justice to its efforts. While there is room for improvement, all that is required is prompt action by high authorities to address such issues with high responsibility and full support from the "Rakyat."

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DECLARATION OF CONFLICTING INTERESTS

The author(s) declared no potential conflicts of interest with respect to the research, authorship, or publication of this article.

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I-CReST 2022:151-128 - Social Support as a Mediator of Stress and Life Satisfaction for People with Intellectual or Developmental Disabilities during the COVID-19 Pandemic

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ABSTRACT

This study examined factors that predict stress level and life satisfaction among adults with intellectual or developmental disabilities during the COVID-19 pandemic and the role of social support. Stress was significantly correlated with both mental illness and severity of behaviour problems, with each additional stressor increasing the odds of poor mental health by 20%. This relationship held, even after controlling for level of ID, gender, and place of residence. Lack of social support was associated with having a mental illness; individuals who lacked social support was twice as likely to have a mental illness. The importance of considering these factors in the prevention, diagnosis, and treatment of mental health in this population is discussed. In this paper, the author will analyze three formulations of the main analysis: (a) How were individuals with intellectual or developmental disabilities impacted by the pandemic, including impacts on employment and on their life in general? (b) What demographic, personal, and environmental factors predict stress level and life satisfaction during the pandemic for adults with intellectual or developmental disabilities? (c) Does social support mediate the relationship between stress level and life satisfaction for adults with intellectual or developmental disabilities during the pandemic? The methodology used is qualitative with convenience sampling. The author will gather responses in the author area which is Hulu Selangor, a dept interview was developed. Using convenience sampling, the author will reach out to personal contacts within universities, as well as local agencies and groups and ask them to distribute the survey to potential participants with and without disabilities within their networks.

Keywords: COVID-19; employment; satisfaction with life; social support; stress; well-being

1. INTRODUCTION

People with disabilities (PWDs) in Malaysia are among the most needy minority groups in the Malaysian population [1]. Almost everyone will be disabled, either temporarily or permanently, at some point in their lives. According to the World Health Organization (WHO), over 1 billion people – roughly 15% of the global population – are currently disabled, and this number is growing due to demographic aging and a rising prevalence of diabetes complications. The pandemic of COVID-19 has had a huge impact on the lives of individuals with disabilities (ID). Adults with ID are more likely to be infected with COVID-19 and, once exposed to the virus, have higher rates of hospitalization and mortality, according to research from around the world [2]. As an outcome, the Malaysian government implemented the Movement Control Order (MCO) for the public good on 18 March 2020; it was filled by the Conditional MCO (CMCO) on 4 May 2020, which was then replaced by the Recovery MCO

(RMCO) on 10 June 2020. During the early stages of MCO, Malaysians found it difficult to comply to the severe restrictions, such as forbidden public gatherings and community distancing demands; Malaysians are a highly social bunch, and social gatherings are an integral part of their daily lives [3]. Regardless of the physical health safeguards, stay at home orders have had a negative impact on mental health and overall health [4], especially for those in the disabled community.

Parents and caregivers of people with disabilities, for example, experienced negative effects on mental health as a result of increased providing care needs, fear of exposure to the virus, and rising economic burdens [5], as well as negative impacts on quality of life and wellbeing [6]. Parents and caregivers also experienced a decline in support programs and access to basic services [7]. Disabled children were denied access to academic, treatment, and medical care [6].

Individuals with intellectual or developmental disabilities may experience increased stress in addition to the stress and fear of becoming ill [8], because they are more likely to encounter social difficulties in life and health disparities when being managed in health services during in the pandemic. Adults with severe intellectual disabilities may also suffer from stress related to social distancing [9].

The current study sought to ascertain how the COVID19 pandemic affected adults with intellectual or developmental disabilities, as well as what factors were associated with stress levels and life satisfaction during the pandemic. Furthermore, researchers investigated whether increased stress was associated with decreased life satisfaction or even whether social support moderates the association between stress and life satisfaction in people with intellectual or developmental disabilities. In this article, social support generally refers to the respondents' perceptions or explanations offered by the social support.

This research objectives is (a) to determine individuals with intellectual or developmental disabilities impacted by the pandemic, including impacts on employment and on their life in general, (b) to investigate demographic, personal, and environmental factors predict stress level and life satisfaction during the pandemic for adults with intellectual or developmental disabilities, and (c) to determine social support mediate the relationship between stress level and life satisfaction for adults with intellectual or developmental disabilities during the pandemic.

2. BODY

2.1 Intellectual or Developmental Disabilities Individual in Government Organization Center

Persons with disabilities, who have a certain feelings as the rest of society, face increased complexities, particularly when faced with the "steadily for the past bed dilemma," in which persons with disabilities may be left behind due to bias, stereotypes, and even disability discriminatory treatment. In this regard, no residential standard or regulation can protect unfair judgements.

There is also confusion as to what will occur to supportive services when they are needed, what will happen with remediation, and how support services are available on an equal ground

with everyone else well according to the willpower priorities of people with disabilities. This confusion is compounded for those that are poor, homeless, or face forced institutionalization. For example, Taman Sinar Harapan which is an organization of disabilities and mental health people's been placed. This service is open to People with Disabilities who are registered with the Department of Social Welfare and recommended by a medical officer or physician. As for them this is their home even though before Covid-19 they are not been out of that home but still these people still get the effect from it.

3. METHOD

A detailed interview was designed to elicit broad responses on this topic. Individuals 18 years and older with and without disabilities and/or chronic health conditions participated in a survey interview. Using convenience sampling, the researcher contacted personal contacts within local agencies and groups, and asked them to conduct interviews with potential participants with and without disabilities within their networks. The survey was open from early April 2022 to late June 2020.

The survey was designed specifically to learn how the COVID19 pandemic has affected people all over the world, including those with intellectual or developmental disabilities. The survey included COVID19 detailed questions that were exploratory and descriptive in nature and measures for assessing the behavioural impact of the pandemic, as the goal was to study the new experience with the COVID19 pandemic.

4. RESULTS AND DISCUSSION

Finding is the most important part in the research. Basically, findings are the result based on the facts which is the data from the respondents who participated in the experiment and research. For these qualitative findings, authors recruit participants who are convenient and easily accessible.

In this chapter, the data analysis will be presented in four sections. The first section presents the first objective that is to investigate demographic, personal, and environmental factors that predict stress level and life satisfaction during the pandemic for adults with intellectual or developmental disabilities. The second section presents adults that live at Taman Sinar Harapan impacted by the pandemic, including impacts on employment and on their life in general. The third section is about the factors that cause youth to easily get depression. And the last section will be presenting social support mediate the relationship between stress level and life satisfaction for adults with intellectual or developmental disabilities during the pandemic.

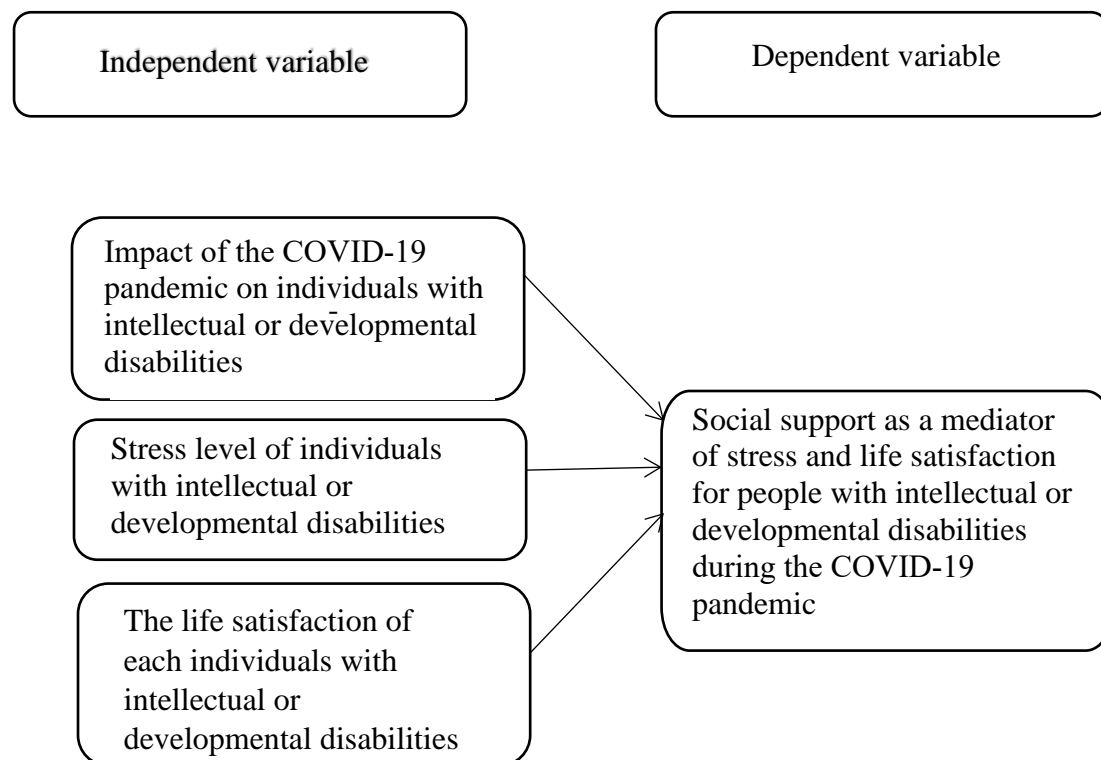
The background data or demographic respondents was collected through questions in section one of the research instruments. In this research, author find that some of the adults that physical disability and can think, they do know the pandemic of Covid-19 meanwhile for the adults that is cognitive disability which they could not communicate well enough, they just show their emotions through cry, shout. They experience stress and that is why they just can cry all about it. Because during the pandemic they really could not go out of the dorm of each of them.

In addition, there is currently 7 dorm that being personalized with 3 dorms is all for men and 4 dorms is for the women. For the men dorms, one dorm is basically has 35 people and apart from that total of individual with intellectual and disabled people at the Taman Sinar Harapan is 295 which basically there almost reach 300 people. And all of the men adults has mental health problem. Half of the adults that live there are could not move which they have to been take care by the staff like bath, and, eat.

The author also discovers that if the adults present could not stop shouting and crying because they could not leave the dorms. The healthcare assistants which is the staff will help to calm them down because each of them has the knowledge that they stated that they have the certificate that was given by the government in dealing with intellectual and disabled people.

Furthermore, at Taman Sinar Harapan, a government institution for intellectual and disabled people, there are three counsellors or physiologists who manage their emotions and physical well-being. However, according to the staff, this is insufficient because the three of them cannot handle almost all of the adults there, which is why each dorm is supervised by a healthcare assistant.

4.1 Research Framework



Section A: How were individuals with intellectual or developmental disabilities impacted by the pandemic, including impacts on employment and on their life in general?

Less communication with people around them makes them easily feel down.

Adults that have difficulty to communicate bring their emotions with cry, scream

Lack of going out of the dorms leads them towards stress

Adults that can walk and communicate well fought with each other

Stress is triggered by a major life event, illness or a combination of factors particular to a certain place and time.

Section B: What demographic, personal, and environmental factors predict stress level and life satisfaction during the pandemic for adults with intellectual or developmental disabilities?

Losing interest in things usually enjoy as their family did not visit during pandemic

Intellectual/disability adults who have weakened immune systems will easily get stressed.

Women more likely to get stress cause of various change in hormone

Tend to be low self-esteem and moody for adults that can walk and communicate well

Refuse to speak and withdrawing from friends and family

Section C: Does social support mediate the relationship between stress level and life satisfaction for adults with intellectual or developmental disabilities during the pandemic

Lack of access to healthcare and support services for individuals with intellectual or developmental disabilities

Lack of empowerment based on social support services

Intellectual/disability adults does not eat regularly, exercise, sleep enough

5. CONCLUSION

According to the current study, the pandemic had a negative impact on the lives of the majority of respondents who had an intellectual or developmental disability. Individuals with an intellectual or developmental disability experienced feelings of stress in addition to these psychological impacts, and nearly half of the respondents disclosed neutral happiness to unhappiness with life. Furthermore, the pandemic's negative effects on life, stress level during the pandemic, and social support predicted life satisfaction during the pandemic. Finally, social support was discovered to be a significant mediator, mediating the relationship between stress levels and life satisfaction.

Considering that the data for this study was gathered at the start of the pandemic, many of the issues presented, such as feelings of loneliness and poor psychosocial well-being, are still continual and will most likely continue long after the pandemic is over. Because they feel that they've been living there but no one outside of an NGO visited them. This is concerning because individuals with intellectual or developmental disabilities were already more likely to face these psychosocial and vocational challenges prior to the pandemic.

There are limitations to this study. First, although the author did visit Taman Sinar Harapan to interview the adults there, there are some questions not being answered by them but the staff help it though. As authors have less knowledge in communication with intellectual and disability adults. Second, the author could not receive answers from almost all adults; the majority of them have mental health and could not think straightly.

This study has important implications for practice and research because the influence of stress and social support on the value of life and mental health is comparatively rare in decision-making for people with intellectual or developmental disabilities, especially in such an extraordinary COVID19 crisis. Individuals with specific learning disabilities have been denied access to critical healthcare and support services as a result of the pandemic.

Finally, research is needed to examine the characteristics of participants with intellectual or developmental disabilities during the disease outbreak over level to identify how they cope, discover potential concerns that arise, and start preparing counselors to deal with these issues once requirements are met. This would also aid in determining which services are most beneficial and necessary. It is critical to conduct research on healthcare and the best way to provide certain assistance to patients with intellectual or developmental disabilities.

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I-CReST 2022:161-145 - Tahap Pengetahuan dan Amalan Solat di Kalangan Pelajar Jabatan Pelancongan dan Hospitaliti Politeknik Muadzam Shah

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ABSTRAK

Solat merupakan rukun Islam yang kedua yang menjadi asas dan tiang agama dalam Islam. Walau bagaimanapun masih terdapat golongan yang tidak melaksanakan ibadat solat terutamanya di kalangan pelajar. Menurut kajian oleh [5], para pelajar didapati kurang menitikberatkan pelaksanaan solat yang difardhukan keatas mereka. Kekekapan pelaksanaan solat di kalangan pelajar berkait rapat dengan gaya hidup dan pelajar menganggap solat hanya perlu dilakukan oleh golongan tua sahaja. Kertas kajian ini dilaksanakan bagi memeriksa tahap pengetahuan dan amalan ibadah solat di kalangan pelajar Politeknik Muadzam Shah. Terdapat dua objektif kajian ini iaitu yang pertama untuk mengkaji tahap pengetahuan pelajar berkaitan solat. Ojektif kedua kajian pula adalah untuk mengukur tahap amalan solat di kalangan pelajar. Dalam kajian ini, soal selidik yang digunakan diadaptasi daripada [7], dan telah diedarkan kepada pelajar-pelajar Jabatan Pelancongan dan Hospitaliti Politeknik Muadzam Shah. Data responden telah dianalisis menggunakan Statistical Package for Social Sciences (SPSS) versi 22. Dapatan kajian mendapati tahap pengetahuan pelajar tentang solat adalah pada tahap yang sederhana, Selain itu, tahap amalan solat pula adalah pada tahap yang sederhana iaitu nilai skor min keseluruhan adalah 3.5476. Hasil kajian ini mendapati pelajar masih gagal untuk menunaikan solat lima waktu secara sempurna. Justeru dapatan kajian ini diharapkan dapat memberikan satu kesedaran bagi semua pihak terutamanya pensyarah politeknik untuk melaksanakan penambahbaikan terhadap amalan solat pelajar. Hal ini dapat dilakukan dengan menganjurkan pelbagai program, kursus atau kem solat yang bertujuan khusus untuk meningkatkan pengetahuan serta kesedaran tentang amalan solat dalam kehidupan seharian pelajar.

Kata Kunci: Pengetahuan; amalan; ibadah solat

1. PENGENALAN

Kewajipan menunaikan solat merupakan perintah Allah SWT yang penting dan mempunyai kesan positif kepada perjalanan hidup manusia. Solat yang didirikan dengan sempurna, disamping usaha mendekatkan diri kepada Allah SWT dan bertaqwa kepadanya dapat membolehkan umat islam mencapai kedudukan yang terpuji dan termasuk dalam golongan orang yang beriman,. Kepentingan mengerjakan ibadah solat diperkukuhkan dengan firman Allah yang bermaksud

“Sesungguhnya solat itu mencegah dari (perbuatan) keji dan mungkar”

(Surah Al-Ankabut, Ayat 45)

Ibadat solat boleh dikategorikan kepada dua kategori, iaitu solat fardhu dan solat sunat. Solat fardhu merupakan solat yang menjadi kewajipan ke atas setiap individu muslim yang berakal. Solat fardhu wajib dilaksanakan lima kali sehari semalam tanpa mengambilkira keadaan atau kesihatan seseorang muslim tersebut. Kategori yang kedua pula adalah solat sunat. Solat sunat ini sangat digalakkan oleh Islam untuk dilaksanakan oleh umatnya. Hal ini kerana jika dilaksanakan, ia dapat melengkapi kekurangan-kekurangan yang mungkin terdapat dalam solat fardhu [8].

Masalah generasi muda yang tidak mengendahkan kepentingan bersolat masa kini amat membimbangkan. Menurut [4], jika masalah generasi muda yang tidak solat ini berterusan, ia boleh memberikan impak yang negatif kepada pembentukan sahsiah dan nilai taqwa mereka. Jika tidak dibendung segera, generasi muda akan terus meninggalkan solat dan mereka akhirnya hidup tanpa penghayatan agama. Natiujahnya, terjadilah keruntuhan akhlak di kalangan mereka sedangkan mereka inilah yang diharapkan untuk memimpin negara kelak[5].

Permasalahan yang sama disokong oleh kajian [6]. Menurut kajian ini, ramai umat Islam di Malaysia yang mengabaikan ibadah solat. Umat Islam dilihat ramai yang tidak konsisten bersembahyang cukup 5 waktu setiap hari. Menurut kajian ini lagi, golongan remaja merupakan golongan umat Islam yang paling ramai di Malaysia. Namun, pengamalan solat di kalangan mereka ini adalah lemah dan mendukacitakan.[6].

Oleh yang demikian, bagi tujuan melahirkan generasi muda yang menitikberatkan amalan solat dalam hidup mereka, maka penyelidikan berkaitan solat ini dirasakan amat signifikan untuk dijalankan. Kajian ini dilaksanakan bertujuan untuk melihat tahap pengetahuan dan amalan solat dalam kalangan pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah. Secara khusus, objektif serta persoalan kajian ini adalah:

- i. Mengkaji apakah tahap pengetahuan solat dalam kalangan pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah.
- ii. Mengenalpasti apakah tahap amalan solat dalam kalangan pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah.

Kajian yang dijalankan ini diharapkan dapat memberikan sumbangan kepada perkembangan ilmu, polisi dan dasar pendidikan pengajian tinggi, ibu bapa serta institusi pengajian tinggi dalam memantapkan pengetahuan dan amalan solat di kalangan pelajar.

2. ISI KANDUNGAN KAJIAN

Bahagian ini dibina bagi membincangkan tentang sorotan kajian bagi menyatakan hasil dapatan kajian-kajian lepas, metodologi yang digunakan untuk menganalisa data dalam kajian ini, dan akhir skali berkenaan dapatan serta perbincangan bagi setiap persoalan kajian.

2.1 Sorotan Kajian

Di Malaysia, terdapat kajian-kajian lepas yang menunjukkan generasi muda terutamanya pelajar di pusat pengajian tinggi masih lemah dalam mendirikan ibadah solat walaupun ilmu asas fardhu ain terutamanya berkenaan solat ini telah dipelajari ketika bersekolah. Satu kajian yang dijalankan ke atas pelajar semester satu Politeknik Kuching Sarawak telah menemukan bahawa tahap amalan solat pelajar-pelajar ini masih di tahap yang kurang memuaskan. Kajian ini menyarankan agar tindakan segera perlu diambil bagi memastikan tahap kesedaran dan pengamalan solat dalam kalangan pelajar.

Seterusnya, kajian ke atas pelajar pelajar Universiti Utara Malaysia telah menemukan bahawa tahap penghayatan solat dikalangan pelajar ini adalah rendah. Pelajar-pelajar tidak menganggap bahawa pelaksanaan solat merupakan satu perkara yang penting dalam hidup mereka [3]. Kajian ini juga mendapati gaya hidup pelajar menjadi penyebab utama berlakunya perkara ini.

Satu kajian lain yang dilaksanakan ke atas pelajar-pelajar Politeknik Kota Kinabalu telah mendapati tahap pengetahuan solat pelajar adalah sederhana [7]. Dapatan kajian ini juga mendapati tahap amalan solat para pelajar turut di tahap yang sederhana. Dapatan yang sama juga diperoleh daripada kajian terhadap pelajar-pelajar institusi pengajian tinggi di negeri Kelantan yang mana tahap perlasanaan solat fardhu pelajar masih kurang memuaskan.[9]

Dapatan kajian yang sama turut diperoleh dalam kajian ke atas amalan solat pelajar Politeknik Tuanku Syed Sirajuddin. Pelajar didapati tidak melaksanakan solat mengikut waktu yang difardhukan [4]. Melalui kajian ini juga, para pelajar sendiri mengakui yang mereka memerlukan sokongan daripada ibu bapa, kawan-kawan dan persekitaran dalam memastikan mereka melaksanakan solat fardu dengan sempurna.

Terkini, dapatan oleh kajian yang dilaksanakan ke atas pelajar-pelajar politeknik Hulu Terengganu menemukan tahap amalan solat pelajar adalah sederhana biarpun pelajar faham akan kepentingan solat [10]. Tahap pelaksanaan solat pelajar juga didapati amat bergantung dengan faktor luaran seperti ibu bapa, rakan sebaya dan media massa.

2.2 Metodologi Kajian

Rekabentuk kajian yang dijalankan ini adalah berbentuk deskriptif yang bertujuan untuk melihat tahap pengetahuan dan amalan solat dalam kalangan pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah.

Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah terdiri daripada dua jenis program iaitu Diploma Perlancongan Rekreasi (DRT) dan Diploma Pengurusan Pelancongan (DUP). Populasi yang terlibat dalam kajian ini adalah pelajar-pelajar beragama islam yang terdiri daripada pelajar semester satu sehingga lima bagi kedua-dua program di jabatan ini. Jumlah sampel yang terpilih menjadi responden kajian ini adalah sebanyak 150. Soal selidik dikumpulkan menggunakan aplikasi *Google Form* dan data telah dianalisa menggunakan *Statistical Package for Social Sciences (SPSS) version 22 (IBM Corporation, New York, NY, USA)*.

Kajian ini mengadaptasi soalselidik [7] sebagai instrument kajian. Soal selidik ini mengandungi tiga bahagian bagi mengumpulkan data. Bahagian A memerlukan responden

untuk melengkapkan maklumat demografi. Bahagian B pula mengumpulkan maklumat berkenaan tahap pengetahuan solat pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah. Akhir sekali, Bahagian C mengukur tahap amalan solat pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah. Item item di Bahagian B pula menganalisa tahap pengetahuan solat para responden. Dalam bahagian ini responden perlu menjawab 15 soalan berkenaan rukun solat, dan juga 10 soalan berkaitan perkara sunat dalam solat. Responden perlu menjawab salah satu pilihan saada Ya, Tidak Pasti atau Tidak. Akhirnya, Bahagian C diukur menggunakan skala likert yang bermula dengan 1 (sangat tidak bersetuju) sehingga 5 (sangat bersetuju) untuk mendapatkan tahap pengamalan solat di kalangan pelajar. Tahap amalan solat ini kemudiannya dianalisa berdasarkan nilai skor min seperti dalam Jadual 1.

Jadual 1: Nilai Skor Min

Nilai Skor Min	Tahap
3.67 – 5.00	Tinggi
2.34 – 3.66	Sederhana
1.00 – 2.33	Rendah

(Sumber : [2])

Merujuk kepada Jadual 1 dapatan bagi bahagian ini mengelaskan semula lima point skala likert kepada tiga peringkat. Peringkat pertama adalah rendah di mana nilai skor min antara 1.00 hingga 2.33, di ikuti dengan sederhana bagi skor min 2.34 hingga 3.66 dan skor min 3.67 hingga 5.00 dikategorikan sebagai tinggi [2].

2.3 Dapatan dan Perbincangan Kajian

2.3.1 Demografi Responden

Jadual 2 menunjukkan data demografi responden yang terlibat dalam kajian ini. Berdasarkan jadual tersebut, majoriti responden adalah pelajar perempuan (73%) berbanding pelajar lelaki (27%). 67% responden adalah merupakan pelajar daripada program DUP manakala selebihnya adalah daripada program DRT. Pelajar Semester 2 (35%) menunjukkan responden paling ramai menjawab soal selidik ini diikuti dengan pelajar Semester 1 (23%), Semester 3 (21%), Semester 4 (13%) dan Semester 5 (8%). Hampir keseluruhan (98%) responden pernah menghadiri kelas Fardhu Ain. Ini bermakna para pelajar telah mendapat pengetahuan awal tentang solat dan kepentingannya sejak dari alam persekolahan lagi.

Jadual 2: Demografi Responden

		Bilangan	Peratusan (%)
Jantina	Lelaki	40	27
	Perempuan	110	73
	Jumlah	150	100
Program	DRT	49	33
	DUP	101	67
	Jumlah	150	100
Semester	Semester 1	34	23
	Semester 2	52	35
	Semester 3	32	21

	Semester 4	20	13
	Semester 5	12	8
	Jumlah	150	100
Pernah menghadiri Kelas Fardhu Ain	Ya	147	98
	Tidak	3	2
	Jumlah	150	100

2.3.2 Persoalan Kajian 1 : Apakah Tahap Pengetahuan Solat dalam kalangan Pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah?

Bagi mengukur persolan kajian yang pertama ini, item dikategorikan kepada dua iaitu pengetahuan berkenaan rukun solat dan juga pengetahuan berkenaan perkara sunat dalam solat.

Jadual 3: Tahap Pengetahuan Pelajar Tentang Rukun Solat

No	Item	Ya (%)	Tidak Pasti (%)	Tidak (%)
1	Rukun Solat ada 12 perkara	14	9	77
2	Rukun solat terbahagi kepada rukun Qauli dan Fi'li.	63	15	22
3	Tempat niat mestilah di dalam hati.	85	5	10
4	Berdiri tegak merupakan salah satu rukun solat.	80	7	13
5	Mengangkat tangan ketika takbiratul ihram adalah rukun solat.	85	7	8
6	Rukuk adalah rukun solat yang kedua.	17	13	69
7	Sujud dilakukan sebelum rukuk.	7	3	89
8	Memberi salam adalah rukun solat yang terakhir.	53	9	39
9	Duduk antara dua sujud adalah rukun solat.	95	5	0
10	Duduk tahiyat awal adalah rukun solat.	59	8	33
11	Tomakninah bermaksud berhenti seketika.	85	11	4
12	Berselawat ke atas nabi dilakukan ketika tahiyat akhir.	87	7	6
13	Tertinggal salah satu rukun solat boleh membatalkan solat.	62	20	18
14	Meninggalkan bacaan al-Fatihah boleh merosakkan solat.	86	10	4
15	Tertib bermaksud melakukan semua rukun mengikut susunan	91	8	1

Jadual 3 menunjukkan peratusan pengetahuan pelajar berkenaan rukun solat. Berdasarkan jadual tersebut, 11 soalan berjaya dijawab dengan betul oleh majoriti (lebih 50%) pelajar. Ini menunjukkan responden mempunyai pengetahuan yang baik tentang rukun-rukun solat. Walau bagaimanapun, terdapat 4 soalan gagal dijawab dengan betul oleh pelajar pelajar ini iaitu bagi soalan 2,5,8 dan 10 dan. 78% pelajar tidak mengetahui bahawa rukun solat ada tiga iaitu tambahan Rukun Qauli, Fi'li dan Qalbi.

Berikutnya, 92% pelajar tidak mengetahui bahawa mengangkat tangan ketika takbiratul ihram bukan merupakan rukun solat. Perbuatan mengangkat tangan sebenarnya merupakan perkara sunat di dalam solat. Ini diikuti dengan 62% pelajar tidak tahu bahawa member salam bukan merupakan rukun solat yang terakhir. Akhir skali didapati 67% pelajar tidak mengetahui hukum duduk tahiyat awal adalah sunat dan bukan merupakan rukun solat.

Hasil kajian juga mendapati hanya 2 orang pelajar berjaya menjawab kesemua solan dengan betul. Cuma 1% daripada keseluruhan responden mengetahui dengan sempurna rukun solat. Justeru itu, hasil dapatan ini boleh disimpulkan bahawa tahap pengetahuan pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah tentang rukun solat adalah pada tahap yang rendah

Jadual 4: Tahap Pengetahuan Pelajar Tentang Perkara Sunat Solat

No	Item	Ya (%)	Tidak Pasti (%)	Tidak (%)
1	Sunat solat terbahagi kepada sunat ab'adh dan hai'at.	72	24	4
2	Apabila tertinggal sunat ab'adh hendaklah digantikan dengan sujud sahwi.	57	31	12
3	Meninggalkan membaca tahiyat awal tidak merosakkan solat.	43	24	33
4	Doa qunut wajib dibaca pada rakaat kedua solat subuh	38	9	53
5	Sujud sahwi dilakukan sebagai ganti kerana terlupa melakukan salah satu sunat hai'at.	54	15	31
6	Meninggalkan membaca doa iftitah tidak menjejaskan solat	72	15	13
7	Membaca surah selepas al-Fatihah merupakan sunat hai'at	68	17	15
8	Menyaringkan suara pada solat zuhur dan asar boleh membatalkan solat.	17	39	44
9	Menggerak-gerakkan jari telunjuk ketika membaca tahiyat merupakan perbuatan sunat solat	25	32	43
10	Meninggalkan membaca doa ketika sujud tidak menjejaskan solat.	53	23	24

Bagi bahagian kedua iaitu pengetahuan pelajar berkenaan perkara sunat di dalam solat. Jadual 4 menunjukkan peratusan pengetahuan pelajar berkenaan perkara sunat dalam solat. Berdasarkan jadual tersebut, 6 soalan berjaya dijawab dengan betul oleh majoriti (lebih 50%) pelajar. Ini menunjukkan responden mempunyai pengetahuan yang baik tentang sunat-sunat solat.

Walau bagaimanapun, terdapat 4 soalan gagal dijawab dengan betul oleh majority pelajar ini iaitu bagi soalan 3,5,8 dan 9. 57% pelajar tidak mengetahui bahawa meninggalkan membaca tahiyat awal tidak merosakkan solat kerana ia merupakan sunat solat. Berikutnya, 69% pelajar tidak mengetahui bahawa sujud sahwi dilakukan sebagai ganti kerana terlupa melakukan salah satu sunat ab'adh dan bukannya sunat hai'at.

Ini diikuti dengan 56% pelajar tidak tahu bahawa menyaringkan suara pada solat zuhur dan asar tidak membatalkan solat. Akhir skali didapati 75% pelajar tidak mengetahui bahawa menggerak-gerakkan jari telunjuk ketika membaca tahiyat merupakan perbuatan sunat solat.

Kajian ini juga mendapati hanya 8 (5%) orang pelajar Berjaya menjawab kesemua solan ini dengan betul. Peratusan yang rendah ini menunjukkan bahawa tahap pengetahuan pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah tentang perkara sunat dalam solat adalah pada tahap yang rendah

Dapatan kajian ini menunjukkan secara keseluruhan, tahap pengetahuan pelajar tentang solat adalah pada tahap yang rendah dan kurang memuaskan. Rukun solat perlu difahami serta diikuti dengan sempurna kerana kesilapan pada mana mana satu rukun solat ini boleh menyebabkan solat terbatal. Begitu juga dengan perkara sunat, biarpun ia tidak membatalkan keseluruhan solat, namun kesan meninggalkan sunat-sunat solat boleh menyebabkan solat yang didirikan kurang penghayatan.

2.3.3 Persoalan Kajian 2 : Apakah Tahap Amalan Solat dalam kalangan Pelajar Jabatan Perlancongan dan Hospitaliti Politeknik Muadzam Shah?

Jadual 5: Tahap Amalan Solat di kalangan Pelajar

No	Item	Min	SD
1	Pada pendapat saya tahap pengetahuan solat saya adalah pada tahap	3.5667	0.6494
2	Solat fardhu merupakan solat yang wajib dilakukan oleh individu Muslim.	4.9533	0.1155
3	Saya lebih suka menunaikan solat di masjid.	3.5800	0.8994
4	Saya tidak merasa malas untuk mengerjakan solat.	3.6200	1.1032
5	Saya mengerjakan solat cukup 5 kali sehari.	3.7000	1.0346
6	Saya sentiasa menunaikan solat.	3.4600	1.2830
7	Saya sering mengajak ahli keluarga mengerjakan solat.	3.6467	1.0109
8	Saya akan memastikan ahli keluarga saya mengerjakan solat.	3.9867	0.9340
9	Ketika sakit saya tetap mengerjakan solat.	3.3267	1.1729
10	Saya segera menunaikan solat apabila tersedar masa solat sudah habis.	3.9133	1.1289
11	Saya berminat menghadiri program yang berkaitan solat.	3.9400	0.9066
12	Saya merasakan selama ini cara solat saya sudah betul.	3.3400	0.8657
13	Saya berpuashati dengan bacaan al-Fatihah dan bacaan dalam solat saya.	3.6533	0.9830
14	Saya tahu cara untuk mengerjakan bersolat.	4.5467	0.9454
Min Keseluruhan		3.5476	0.9309

Berdasarkan Jadual 5, hasil analisis data tahap amalan solat di kalangan pelajar menunjukkan min keseluruhan berada pada tahap yang sederhana iaitu 3.5476. Jadual turut menunjukkan bahawa hanya 6 item yang menunjukkan tahap amalan solat pelajar adalah tinggi iaitu item 2,5,8,10 dan 11. Bagi 8 item yang lain seperti tahap pengetahuan, amalan solat di masjid, perasaan tidak malas bersolat, kekerapan bersolat, mengajak ahli keluarga bersolat menunjukkan skor min pada tahap yang sederhana. Hal ini menunjukkan mereka sedar akan kefardhuan solat atas individu Muslim tetapi mereka sendiri tidak mengamalkan solat secara istiqamah.

3. KESIMPULAN

Sebagai kesimpulan, kajian ini mendapati bahawa tahap pengetahuan serta amalan solat pelajar Politeknik Muadzam Shah adalah sederhana dan kurang memuaskan. Dapatan ini jelas membimbangkan lantaran masih ramai pelajar yang tidak menunaikan solat fardhu secara

sempurna dan istiqamah. Dapatan ini juga membuktikan bahawa para pelajar masih lagi perlu kepada pemantauan dan bimbingan daripada ibu bapa, pensyarah dan rakan rakan.

Hasil kajian ini seharusnya memberikan satu kesedaran bagi semua pihak terutamanya pensyarah politeknik untuk melaksanakan penambahbaikan terhadap amalan solat pelajar . Justeru itu, sebarang langkah atau usaha dalam memastikan pelajar melaksanakan solat perlu dititikberatkan. Penganjuran pelbagai program, kursus atau kem solat yang bertujuan khusus untuk meningkatkan pengetahuan serta kesedaran tentang amalan solat dalam kehidupan seharian pelajar perlulah dilaksanakan dengan lebih banyak agar dapat melahirkan pelajar yang berkualiti dari segi sahsiah dan nilai taqwa dalam diri serta mampu mencapai kecemerlangan dunia dan akhirat.

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I-CReST 2022:167-151 - Exploring Student's Perception on the role of Learning Management System to Support Learning in Polytechnic English Language Classroom

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ABSTRACT

The adoption of a Learning Management System (LMS) is seen to be increasingly popular in recent years and has been used by many higher education institutions in the belief to create more engaging and accessible learning environments. In fact, studies have shown the positive impact LMS has offered on the quality of learning. However, the acceptance of LMS among the users is determined by accounting for the use of the platform and the users' experience. It is crucial to gain real responses from the perspective of the user to improve the quality of the system. Currently, all Polytechnic in Malaysia is embracing their own learning platform known as CIDOS and studies involving this platform to understand the experience of the user are sparse. This study was conducted to gain perception from the end-user of the CIDOS platform, the student. A semi-structured interview was designed and posted to 10 respondents to understand their attitude, actual use and challenges they face while using the platform. The student's perceptions were measured and viewed within the extended theory of the Technology Acceptance Model (TAM) by Davis (1989). Through thematic analysis, five themes emerged which reflect the students' perception towards the platform. It was concluded that the students' behavior to use were primarily influenced by their perception of the role of the LMS in facilitating learning activities. Reliable sources to retrieve academic materials, lack of active interaction activities, absence of students' autonomy, lecturers' ability to create a fun learning environment and reliability of internet connection are found to be presenting the students' perception. The findings of this study offer an expanded understanding of LMS acceptance among higher education students and a reference for related areas of study.

Keywords: Learning Management System (LMS); CIDOS; Technology Acceptance Model (TAM)

1. INTRODUCTION

The introduction of learning management systems particularly in higher education learning practice is one of the changes that many institutions are currently experiencing in the effort to execute online learning. One such technology that enables eLearning programmes is the LMS (Coskuncay, 2013; Lasanthika, 2019). It is one of the elements of eLearning that is now being used in teaching and learning practices by many higher education institutions (Alenezi, 2018). LMS adoption is not meant to replace traditional classroom settings; rather, it serves as a supplement to them by providing online or campus based access to course materials (Landry et al., 2006; Jamal & Shanaah, 2011). An LMS is a piece of software that has a variety of

integrated instructional features and operations. It appears to be a useful tool that can improve communication between students and teachers.

“Instructors can post lectures or graphics, moderate discussions, invoke chat sessions and give quizzes, all within the confines of the same software system. Not only can instructors and students “manage” the flow of information and communications, but the instructor can both assess and keep track of the performance of the students, monitoring their progress and assigning grades” (Ko, 2010, p.8).

LMS offers varieties in the way students can communicate with instructors. They can write, record (speak), use graphics and visuals to communicate comfortably using the featured application. Students can communicate not only with lecturers but also with other members of the course community. LMS allows interaction to be extended outside the classroom and enhances the traditional face-to-face learning experience (Washington, 2019). The LMS was developed to monitor and keep track of the students’ academic activities and performance. Lecturers can monitor the students’ work progress and at the same time, students are aware that they are being observed behind the screen. This means that the LMS lets both parties play their part and take responsibility for their task without having to meet. LMSs benefit not only the students but also the lecturers (Alenezi, 2018). He added that the software has various advantages compared to traditional systems, which include ease of access, better communication, and increased relationships between students.

A number of studies have been conducted and found out that adapting the LMS as part of the eLearning practice has managed to bring a positive impact in assisting teaching and learning practice especially in Higher Education Institution (HEI). A study conducted by Bere, Deng, and Tay (2018) on the impact of eLearning using LMS on the performance in teaching and learning revealed that eLearning using the LMS is more effective than traditional instruction methods with respect to the improvement of the performance of teaching and learning in higher education. The same result is held by the students studied by Burgstrom (2017) who recognised the ability of Schoology, the Learning Management System in aiding the students’ individual learning and allowing them to pace their own learning in the classroom after the platform is given encouragement by the instructors. The same view is shared by Lasanthika (2019). Effective use of LMS enriches the learning experience for all stakeholders involved. However, does the provided LMS system get full support from the faculty to use it? This research aims to understand and discuss the the perception of the end user of the LMS system

1.1 LMS-CIDOS

CIDOS is a web-based solution designed specifically for efficient and effective control over curriculum document inventory, teaching and learning materials and knowledge sharing. It has been introduced to be used by all polytechnic institutions in Malaysia since around 2010. CIDOS allows lecturers to create forums, chat, upload teaching and learning materials and keep track of student progress (Mohamad, Salam, & Bakar, 2014). With the aim to embrace ICT integration in teaching and learning, the CIDOS is seen as a platform where students can use to access the content of the subject like e-notes, videos, forums and discussions, assignments submission and conduct tests and quizzes.

2. PROBLEM STATEMENT

Several studies related to LMS utilization in higher education institutions revealed a low percentage in the usage of LMS among the students. Bazalais et. al (2018) in his studies recommending an alternative to improve the use of LMS by creating more awareness of how undergraduate or students interact with the learning platform. Venkatesh et al. (2008) indicated that facilitating conditions competes with the other variables in determining actual use behavior. The resources surrounding the use of an information system, determine the pattern of usage.

A study conducted by Al-Sharhan et al. (2021) which investigated the degree of LMS utilization in a private university in Kuwait revealed inadequate use of the LMS function. The administrative and management function like file sharing and assignment distribution and submission is being used more. Meanwhile, interactive learning functions like chat, forum and discussion are rarely used by the instructors. Another similar result was obtained by Azlim et al. (2014) who conducted a quantitative study on 93 lecturers teaching in higher education institutions in Malaysia. The study examined the utilisation of tools in the LMS consisting of groups, chat, forum, announcement, document, Wiki, learning path, users, exercises, course description and agenda. Although the result showed a positive perception towards the advantage of LMS, the use of the system is rather low.

Table 1 presents the individual activity report that has tracked the students' activities while browsing the CIDOS system. The report presents the result for two semesters performed by students of the same class when taking the Communicative English 1 (DUE 10012) course in December 2020 and Session 1 2021/2022. Results showed a decline by 18.37% on the activities done by the students while browsing the system. Therefore, the research is conducted to find out the view from the students' side regarding this matter.

Table 1: Students' Activity Track

Session	Number of Students	Entry uploaded by instructor	Students' Activity Track	%
December 2020	28	63	1135/1764	64.34%
Session 1 2021/2022	28	63	811/1764	45.97%

The screenshot displays the 'Activity completion' report for the course 'DUE30022 COMMUNICATIVE ENGLISH 2'. It includes a navigation bar with options like 'Home', 'My courses', 'JABATAN PENDIDIKAN AM', 'PENGAJIAN SARJANA SIKLUS 2 - DUE', 'JUNE 2022', 'DUE30022 JARID2021', 'Reports', and 'Activity completion'. Below the navigation bar, there are filters for 'Requerita group' (set to 'DUE30022') and 'First name' (set to 'A'). A summary bar shows 'Page: 1/2 (1000)'. The main table lists 28 students and their completion status for various modules, represented by checkboxes.

Figure 1: The report for students' activities completion generated from CIDOS system

This research is expected to understand students' perception on how the LMS-CIDOS has helped them in the learning process and at the same time seek to understand the issues and challenges that slow down the process of achieving a satisfying learning experience. Basically, this study would like to discover the factors that affect students' preference on the system that influence the attitude towards use (AT) which then determine their behavior and intention to use the system.

3. LITERATURE REVIEW

Many research have proven that technology holds great potential for significantly improving second language learning (Beatty, 2013; Chapelle, 2016; Hashim, 2018). Ashrafzadeh and Sayadian (2015) viewed that through the use of technology, teaching and learning can be made interactive and in turn, the instructions become more effective. Many English language teachers have been searching for effective instruction to motivate students to learn English so that the students achieve a better learning experience. One of the options is by employing an eLearning concept in the classroom (Suppasetseree & Dennis, 2010). There are various high-tech, mid-tech and low-tech communication systems that are used for language acquisition as emerging technologies affect the way students learn a language (Genc-Ersoy & Ersoy, 2013). New technologies in education aid in the delivery of educational content, for instance, in making them interactive and immersive (Ahmad et al., 2019). The implementation of technology has provided options for more interesting and productive teaching and learning sessions predominantly in language learning (Pazilah et al., 2019).

Numbers of research have proven that technology has a lot of potential for improving second language learning (Beatty, 2013; Chapelle, 2016; Hashim, et. al, 2018). The use of LMS is an example of how technology is integrated into the teaching and learning process. The LMS is said to be one of the most extensively adopted technologies due to the high rate of adoption by institutions and faculty (Pomerantz, Brown, & Brooks, 2018). However, success cannot be assured by merely deploying new learning strategies, such as LMS. As a result, an expanding number of studies have been conducted to learn more about the attitudes, actual uses, difficulties, and views of students as LMS end users.

In order to learn about the use of an LMS named Moodle, its advantages and drawbacks, Alanezi (2018) conducted a study with 703 students and 40 instructors. Perceived usefulness and perceived ease of use are found to have a significant impact on the intention to use. The likelihood that a student will use the portal for their studies increases with their level of perceived usefulness for the site. Likewise, the likelihood that a student will accept and use the platform increases with the level of perceived ease of use of the systems (Hamid, Salleh, & Laxman, 2020). Umar, Ahmad, Othman & Kadar (2020) also arrived at similar findings where perceived usefulness and perceived ease of use had increased students' intention towards utilizing eLearning except in their study, perceived ease of use was revealed to be the most significant element determining the students' intention and their actual use of such systems. A study by Kumar, Nayak, and Bhinder (2021) found a contrary outcome, showing that perceived ease of use has no bearing on attitudes toward using LMS.

Moving on to the difficulties of utilizing LMS, the LMS's structure would be one of the barriers to students utilizing it because as long as the system is designed to deliver value, attitudes toward its continuous usage will be sustained (Gamble, 2017). Research involving 370 undergraduates found that the intricacy of the LMS's structure discourages them from using

it (Kumar et al., 2021). Due to the availability of more convenient alternatives or issues with understanding the LMS system, the students do not anticipate utilising the LMS. Their willingness to participate in learning activities on LMS is significantly influenced by the LMS's architecture (Hamid et al., 2020). An efficient user interface can make it easier for users to operate the system and significantly reduce the amount of effort needed to do so (Shaheen, 2022).

In addition to the organisation, instructors play a role in influencing students because the materials they present are found to boost students' adoption of e-learning platforms. (Alghizzawi et al., 2019). Additionally, lecturers are supposed to play a significant impact in convincing students to embrace and use the LMS (Hamid et al., 2020). Aside from organization and instructors, technology would be another factor contributing to students' use of LMS. Salloum et al. (2019) found that significant beneficial effects on the use of e-learning systems are earned through computer self-efficacy, enjoyment, and playfulness. The study also showed that accessibility significantly improves e-learning platforms usage. It is noted that a multitude of LMS-related findings have been gathered to understand attitudes, actual usage, difficulties, and perceptions among students who utilize the system. However, there has been a dearth of recent studies done specifically in Malaysian context about English Language classrooms in polytechnics.

4. CONCEPTUAL FRAMEWORK

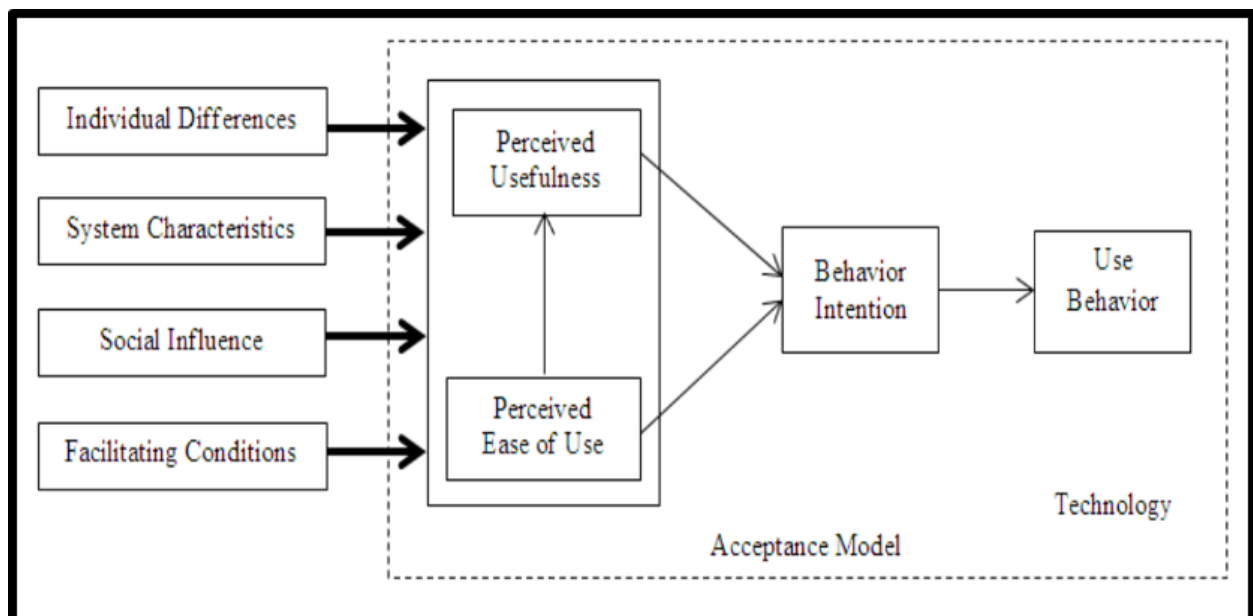


Figure 2: The External Variables for the TAM (Venkatesh & Bala, 2008)

According to the TAM diagram (refer to figure 2), both PU and PEOU are influenced by external variables. The external variables tell in more detail what rooted the PU and PEOU. Zadeh and Fauzi (2019) viewed that if external factors are not determined, the model in examining human behaviors will be too general and could not determine human behavior in more specific situations. In 2008, Venkatesh found out that the external variables in the previous model were not specified and he had synthesized the previous model by formulating

the new version of TAM. He translated the external variables into four categories which are individual differences, system characteristics, social influence and facilitating conditions.

5. METHODOLOGY

A qualitative approach was employed to identify the sources of the respondents' beliefs that shape their perception. The researcher will use interviews and audio recordings as the instrument to collect the data. The primary instrument will be a semi-structured interview where the researcher already prepared seven questions to be asked to the interviewers. The video recording then was transcribed and analyzed to take out the information. As the data has been transferred into text, the researcher categorized the content into themes. The emerging themes were considered as the potential sources of the respondents' beliefs. There were no pre-suggested themes provided in classifying data into units of meaning' to elicit real description information from the respondent (Suhaila & Faizah, 2013). Other than that, interpretations of the data will be shown to the respondents for their confirmation to determine the accuracy of the data thus ensuring internal validity of the study.

The research questions set for this study have become the driving force for adopting the semi-structured interview approach. The table below (Table 1) shows the research questions and the data collection method used to answer them.

Table 1: Data Collection Methods for the Research Questions

Research Questions	Data Collection Methods
1. What are the perceptions of the students about using LMS-CIDOS in learning the Communicative English course?	Interview (open-ended questions)
2. What are the unique experiences the students have encountered concerning the utilization of LMS-CIDOS in learning Communicative English course?	Interview (open-ended questions)
3. What are the perceived conditions and challenges faced by Polytechnic students in using the LMS-CIDOS in the English Language classroom?	Interview (open-ended questions)

5.1 Participants

The sample of the research consisted of 10 students from DAT2A class who are currently taking Diploma in Accounting at Muadzam Shah Polytechnic. The sample has taken Communicative English 1 subject when they were in semester 1 and have experience using the LMS-CIDOS 3.5 platform. During the interview the students were already in their second semester and were required to enroll for the Communicative English 2 course. This could be said that they have background experience in using the system.

6. RESULTS AND DISCUSSIONS

The result is discussed based on the result of the thematic analysis. 10 students have participated in the interview session and had shared their experiences utilizing the system throughout their study time. Based on the inscription the researcher analyzed the most frequent response and categorized the feedback into themes. Through the data analysis process, few themes emerged which presented the interviewee's perception of using LMS-CIDOS systems for the Communicative English (CE) course. Guided by the extended model of Technology Acceptance Model (TAM) the themes reflect some of the elements of the model.

Conversely, interview findings were substantial in validating these outcomes. The first research question (RQ 1) is outlined to find out students' perceived condition of the LMS-CIDOS system. Based on the students' feedback during the interview, they agreed that LMS-CIDOS plays its role to support them in learning CE courses. More than half of the students highlighted that they find it easy to have a platform to submit assigned tasks or exercise by just uploading the file in the platform created by the lecturer. Other than that, students also see the CIDOS as one of the reliable sources for them to access the curriculum content, retrieve students' study guide, get summary of every chapter, and learn the topic to be covered along the semester. The organization of topic by week also helps them to get an overview of what topic to be learned along the semester. This highlights that there is a close relationship between PEOU and PU. In terms of satisfaction, the majority (80%) of the respondent claimed that they enjoy exploring LMS-CIDOS and discover new experiences of using another learning platform compared to what they used to apply at school, which is mostly named google classroom. On the other hand, students also pointed out their frustrations on the system stability as they must deal with poor internet bandwidth and system congestion to access the system during the peak time. The condition of students' devices has also been highlighted by the students as reasons to feel frustrated due to the limited view they get while surfing the system especially when using their mobile phone. This result reflects the structure in TAM model that the external factor in this situation was described as in internet connection and types of devices has given effect to the attitude towards use (AT) even if they find the system is useful for the learning purpose.

To obtain more in-depth understanding the researcher had designed the second research question (RQ 2) which is exploring the students' unique experiences learning English course in CIDOS. Students were questioned about how they find the system helpful in improving their English Language competency and therefore, few themes emerged. The first theme informed that students perceived CIDOS as a reliable platform for academic materials and content dissemination. Students responded that although they used other online learning platforms such as Microsoft Teams, WhatsApp or Telegram for learning interaction, LMS-CIDOS is still mentioned to be sources for the students to get back as reference for topics and checking up their exercise progress. It is believed that students have created 'trust' in the system that it can provide them with necessary information whenever they need and as they choose to get back to the system. This complies with what has been claimed as Voluntariness in Use by Venkatesh (2003) who proposed the extended model of TAM. He then further explained that voluntariness represents the condition under which the intended usage of technology is to be performed. The second theme emerged under (RQ 2) is fewer interesting activities that enable community interaction. According to the students, almost all activities given to them required writing tasks and reading comprehension activities. Little attention is given to improve their listening and speaking skills even though there are features to support these two activities. This clarifies that lecturers did not develop activities that caters all the four language skills. The same result was

found in a study conducted by Annamalai et.al (2021) where it claimed that learning strategies are not impactful due to a lack of interactive activities.

The next theme is the absence of students' autonomy in using the system. Based on the responses, six participants highlighted that they would access the LMS-CIDOS when receiving instruction from the lecturer to download notes, watch videos, submit assignments or exercise and complete quizzes. Lecturers would inform students during real-time online class in Microsoft Teams or in the class WhatsApp group if there are tasks that need the students' attention to do in the CIDOS. In other words, CIDOS will function whenever the lecturer instructs the students to do so. Through the interview, students never mention about them having the autonomy to curate their own account. Basically, students only act like a consumer to the page. The capability of lecture to create an active community of online learning is important to determine the successful use of a system. As cited in Hasnan et. al (2021) the instructor's ability to encourage active communication in the learning environment, form engagement with the online community and deliver the appropriate lesson effectively makes all the difference in student learning outcomes. Instructors must be able and willing to provide immediate feedback and enforce a safe environment where students feel valued and able to share their ideas (Zanjani et al., 2017). Cited in Annamali et. al (2021), Cigdem and Ozturk (2016) assert that if students are not confident about their capabilities of using LMS or view the interaction as problematic, they would prefer not to use the system.

Henceforth, to understand the nature of poor involvement in the students' tracking activity in the CIDOS, the researcher imposes the third research question (RQ3) which intends to find out challenges the students encounter while using the system. Reid (2019) believes that the study on faculty members' and student's perspectives about their experience embracing and using online learning management systems is worth the exploration. It is imperative to understand what the challenges are encountered by the students to interact with the learning platform so the faculty could learn the ground issues that hinder the efficiency of the system. Based on the interview, their unpleasant experience towards the poor performance of the internet bandwidth. As a result, students must use their own device and internet data to fulfill the required task. This finding is consistent with the research literature regarding the infrastructure differences and limitations (Appana, 2008; Mokhtar, 2016; Mozelius & Rydell, 2017; Cheok et al., 2017; Zanjani et al., 2017), and also regarding the emphasis on the significance of good infrastructure and bandwidth that influence technology adoption and acceptance (Kamla & Hafedh, 2010; Wang et al., 2010; Zanjani et al., 2017)

7. CONCLUSION AND RECOMMENDATION

Numerous studies have revealed the advantages of online learning on students' learning and motivation, as well as their listening, reading, writing, and speaking skills (Ling et al., 2019; Ramadania, 2021). It is believed that the quality can be improved to the highest degree with the complete cooperation of every faculty member in maximizing the use of the LMS to promote learning. The necessity for the authority, in particular the department of Polytechnic and Community College, to comprehend and recognize the problems and obstacles preventing technical institutions from providing high-quality education is critical. Through the results gained from this study, it is recommended that the transition to a blended learning environment in the polytechnic institution is facilitated by providing the following: reliable hardware and bandwidth for easy learning access, improved and more user-friendly tools in LMS-CIDOS and insert additional features for communication medium in LMS-CIDOS. Improving the ideas

indirectly could add points to the usefulness of the LMS-CIDOS system as a medium to carry out the blended learning concept in polytechnic and community college institutions. A review made by Ahmadi (2018) on the use of technology in English Language learning concluded that technology provides interaction between teachers and learners, provides comprehensible input and output, helps learners to develop thinking skills, makes learning and teaching more student-centered, promotes learners' autonomy and helps them feel more confident and increases learners' motivation to effectively learn a foreign language. This is also consistent with the findings of Bere, Deng, and Tay (2018) which claimed that interactions through e-Learning using the LMS allow students to engage in their comfort zones or relaxed environments that promote knowledge construction.

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I-CReST 2022:168-152 - The Influence of Perceived Usefulness, Ease of Use and Perceived Security on Consumer Acceptance of Cashless Payment

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ABSTRACT

Cashless payment is a new trend that has emerged due to technological advancements. Furthermore, the cashless payment method is essential and benefits consumers who frequently visit food service establishments. Eating out at restaurants or ordering meals with cashless payment has become increasingly popular. It is related to today's endemic situation that forces people to use contactless payment methods. This study examines the influence of perceived usefulness, ease of use, and perceived security on consumers' willingness to accept cashless payment at food service establishments and applies the argumentative research design approach. The study's findings reveal a positive relationship between perceived usefulness, perceived ease of use, and perceived security with customers' acceptance of cashless payment at food service establishments. Furthermore, the findings encouraged customers to use cashless payment methods, which eliminates the possibility of criminal activity.

Keywords: Cashless payment; perceived usefulness; perceived ease of use; perceived security; foodservice establishment

1. INTRODUCTION

Cashless payment is a payment gateway that electronically transfers funds using debit cards, credit cards, or ACH via mobile phones, websites, kiosks, or other digital devices [1]. Customer preferences for technology that offers fast, convenient, and valuable services drove society's adoption of cashless systems [2]. Furthermore, [3] mentions that cashless payments have been one of the most significant aspects of the global economy and significantly contribute to economic growth. Moreover, cashless payment methods can be used in various industries, particularly the food and beverage industry [4]. Eating out at restaurants or ordering meals for takeout and delivery has grown popular in the United States [5]. Thus, the technology and food service industry are related.

A food service establishment is a location where food is served directly to the consumer in individual portions, either free or for a charge, and the food is consumed inside the premises or elsewhere [6]. He also mentioned the example of food service establishments such as restaurants, bistros, cafes, bars, corner stores and others.

The Covid-19 pandemic has made the use of cashless payment a necessity. [7] supported this statement when he stated that prior to Covid-19, most respondents preferred to dine at restaurants regularly. However, in the post-Covid-19 era, most respondents chose to eat at

restaurants occasionally, such as once a month. The payment method has changed, with most consumers preferring internet transfers to avoid contact [7]. Furthermore, he suggests that restaurants consider accepting online payments rather than cash payments to attract customers, particularly those who prefer contactless payments to avoid contracting the disease. This method will also undoubtedly help restaurant owners survive the pandemic.

Thus, the cashless payment technology must be introduced to consumers who lack awareness of this method. Consumers' lack of awareness of the benefits of cashless payments is one of the main reasons for their slow acceptance [8]. Cashless payment is a new trend that has emerged due to technological advancements, intending to make people's lives easier. According to [9], customers would enjoy the flexibility of not having to carry cash in their pockets. Furthermore, they would not have to go to an Automated Teller Machine (ATM) every time they needed cash. This innovative technology enables smartphone users to perform financial transactions or payments via applications installed on the phone [10]. [9] also supported this claim and stated that with the convenience of high-tech gadgets, the transaction might be done simply using wireless technologies through mobile devices such as smartphones. The internet is a crucial element in cashless payment as all digital payment options necessitate internet use. The internet connects banks so that payments can be made. When buying things online (E-Commerce), the internet is almost always required [11]. Consumers who lack knowledge about cashless payment may prefer to use cash for their purchases. If consumers are not cautious or careless, this payment method may lead to robbery or other related crimes [3].

Some consumers hesitate to use cashless payment due to uncertainty and potentially unwanted results [12]. People will lose trust in the face of uncertainty, according to [13], because of concerns about data security and privacy, the possibility of fraud, technological performance, and process challenges. Consumers who use electronic transactions are increasingly concerned about security. [13] supported this view and mentioned that customers' perceptions of the safety and security of mobile payment operations are the primary issue and obstacle to the wide adoption of mobile payment. [14] state that trust is crucial for consumers to use the cashless payment method. Furthermore, [12] also mentions that Malaysians accept cashless payments; however, participation is minimal due to a lack of awareness and confidence in security issues.

However, customers have their preference to use cashless payment or cash methods at food service establishments such as restaurants and cafes. Some customers struggle to keep up with restaurant technology due to its rapid growth and development. Since the technology will help improve people's quality of life, the researchers decided to conduct this study and hope that the findings will attract more consumers to use the cashless payment methods at food service establishments. As such, this study intends to identify the factors influencing consumer acceptance of cashless payment methods at food service establishments and review the relationship between perceived usefulness, perceived ease of use and perceived security with the acceptance of cashless payment at food service establishments.

2. LITERATURE REVIEW

2.1 Cashless Payment Scenario at Food Service Establishment

Cashless payment can take many different forms and mediums. For example, cashless payment can take the form of credit or debit cards, cheques, online banking, mobile apps or any other type of online payment [15]. Today, most consumers use cashless payment in their daily lives because purchasing any item is more effortless, particularly when visiting a food service establishment such as a restaurant. [16] stated that the number of cashless transactions worldwide increased from 2013 to 2022. It was clearly visible when the Covid-19 pandemic hit the world. In addition, Covid-19 has a negative impact on the hospitality industry, initially with the lockdown and then with changes in customer preferences [7]. As the virus spreads quickly, cashless payment is one of the alternatives to curb the virus from spreading because it keeps people from encountering others. [3] also mentioned that cashless payments have become a vital component of the global economy and seen as an essential factor of economic expansion. [17] indicated that the average online banking rate increased to 74.4% from 2016 to 2018.

2.2 Perceived Usefulness towards Cashless Payment

Perceived usefulness played an essential role in the adoption of cashless payment methods. In the Technology Acceptance Model (TAM), perceived usefulness (PU) is one of the independent characteristics. The Technology Acceptance Model (TAM) defines perceived usefulness as the degree to which a person feels that using a particular system will increase his or her work performance. Perceived usefulness relates to customers' perceptions of what they would get from experience [18]. [19] described perceived usefulness as the amount to which an individual believes a specific system would improve his or her work performance. Perceived usefulness shows that most respondents think cashless payment is extremely beneficial since it can save time and decrease time spent paying [20]. This statement relates to the study where cashless payment users save time when paying at the payment counter. They can use the pay wave method and, at the same time, make the payment process smoother and faster.

2.3 Perceived Ease of Use towards Cashless Payment

According to [21], the degree to which a person believes utilising a particular technology would be painless is characterised as perceived ease of use. The latest research by [20] proves that most responders find cashless payment easy to use and learn. This study intends to focus on the ease of using cashless payment. Cashless payment can make the payment process faster, more convenient, and safer [11]. Therefore, the cashless payment technology can make the payment process more manageable.

2.4 Perceived Security of the Cashless Payment

According to [22], perceived security refers to how much customers feel secure from any system's potential threats. Simply put, the customers feel protected against security threats when using cashless payment. Security is always essential in customers' decisions to use cashless payment methods. [23] stated, "as more consumers are concerned about the security of a cashless payment system, the greater the threat of cashless payment security will be". Customers will lose their desire to use the cashless payment system, especially those who do

not trust it. [24] agreed, claiming that non-cash payment methods are more secure than cash because they prevent wallets from being misplaced.

2.5 Consumer Acceptance on Cashless Payment

Customer preferences for technology that offers fast, convenient, and valuable services drove society's adoption of cashless systems [2]. According to [25], cashless payments eliminate the need to carry a case full of bulky notes. Simply having the necessary cards or using mobile banking would suffice. Moreover, [25] also mentioned that a PIN-protected card, for example, will only work with its credentials, giving the consumers a greater sense of security, unlike carrying cash and alerting everyone to the possibility of taking anything valuable. However, consumer perception plays a role in accepting various digital payment systems [26]. These criteria will affect consumers' acceptance of cashless payments in food service establishments.

Furthermore, the acceptance of cashless payment is based on customer behaviour. Habitual buying behaviour, variety-seeking behaviour, dissonance-reducing buying behaviour, and complex buying behaviour are the four categories of consumer behaviour [27]. Personal, psychological, social, and cultural elements have a role in determining consumer behaviour characteristics. These factors significantly impact a customer's behaviour, and the attributes that define a customer change over time [27].

In addition, [28] stated that consumers prefer to use cash rather than cashless payment when buying goods or services. Since cashless payments have become one of the crucial components of the global economy [3], acceptance among consumers is vital. According to [13], many restaurant chains have recognized the mobile payment trend and its potential benefits. As a result, they have begun to adopt POS systems for such purposes. The reason is that they clearly understand that a cashless payment method will give benefits to both consumers and restaurateurs. Based on the literature from past studies, factors affecting consumer acceptance of cashless payment at food service establishments are perceived usefulness, ease of use [29] and perceived security.

2.6 Conceptual Framework

Figure 1 below depicts the conceptual study framework based on the past literature and highlighted issues. The framework illustrates the relationship between perceived usefulness, perceived ease of use and perceived security towards consumers' acceptance of cashless payments at food service establishments. It further displays the factors influencing cashless payment as an independent variable, while consumer acceptance is the dependent variable.

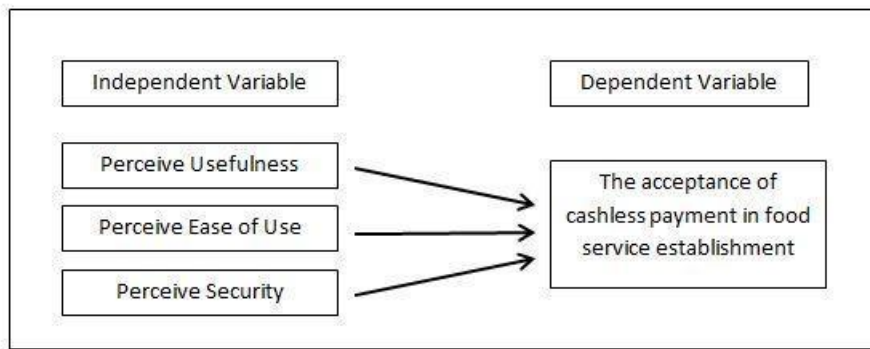


Figure 1: Conceptual framework of perceived usefulness, perceived ease of use and perceived security towards the acceptance of cashless payment establishment

3. METHODOLOGY

This study applied the argumentative research design. Secondary data were employed to collect all the findings in the journal article from previous related studies. For each article, the researchers read and familiarised themselves with the data. To find the articles, the researchers entered keywords related to the study, such as ‘cashless payment’, ‘perceived usefulness’, ‘perceived ease of use’, ‘perceived security’ and ‘food service establishment’. Furthermore, the data gathered were analysed using the content analysis method. Content analysis is a research technique that identifies patterns in recorded communication. Relevant data were collected using a systematic literature review technique. A total of 30 articles from related previous studies on cashless payment, perceived usefulness, perceived ease of use, perceived security, and food service establishment was collected, filtered, and analysed to ensure that it is reliable and precise for discussion.

4. DISCUSSION

The first factor influencing consumers in accepting cashless payments is perceived usefulness. Consumers who are knowledgeable about cashless payment will believe that it has many benefits, which can help improve the performance of cashless payment technology. Most previous studies discovered a correlation between perceived usefulness and cashless payment [30,29,14]. [30] revealed that perceived usefulness positively influenced behavioural intention to use a digital wallet. Furthermore, the research findings have proven a linear relationship, and the regression model used in their research was feasible and correct. Simply put, cashless payment is useful to consumers as it gives numerous benefits. [29,31] acknowledges that perceived usefulness significantly influences e-wallet intentions and adoption. The study's findings will help managers and policymakers design effective techniques for capturing consumers' intention to use and experience e-wallets in a volatile market. According to [31], cashless payments should be set up in existing frameworks and developing economic and policy frameworks to ensure Malaysia stays on track with the latest global trend. It is vital for Malaysia and other countries to keep up with the currents of modernity, which will lead to the growth of cashless payment methods over time. [14] supported this statement indicating that the country will lead a cashless society in 2050. The country will have advanced cashless payment technology that can improve the country's economy. All previous researchers in Asia, such as Malaysia and Indonesia, have agreed that perceived usefulness is a factor that positively correlates with cashless payment. Thus, the hypothesis for this study is accepted. The more knowledge and confidence the customer has in cashless payment, the greater the acceptance of

cashless payment at food service establishments. In other words, a relationship exists between perceived usefulness and acceptance of cashless payment at food service establishments.

Perceived ease of use is the next factor that the researchers retrieved from the past research articles. Perceived ease of use is vital in consumer acceptance of cashless payment at food service establishments. Cashless payment makes the consumer's life easier. It saves time during the payment process as consumers only need to present their debit/credit card or use an electronic device to pay. [30,24,29] agreed as their research findings revealed that perceived ease of use is one of the factors that influence consumers' perception of the use of cashless payment at food service establishments. Besides, cashless payment will be more accessible to consumers with a strong internet connection. The Internet is a compulsory element when it comes to cashless payment. A cashless payment must be compatible with an internet connection to facilitate consumer use. [11] supported this statement stating that the Internet is almost always required. Furthermore, [12] agreed that the perceived ease of use is related to self-efficacy. Perceived ease of use is strongly associated with intention to use and significantly impacts perceived usefulness. It can be said that perceived ease of use depends on the individual who uses cashless payment because everyone has different perceptions due to different cultures and backgrounds. Meanwhile, [20] agreed that cashless payment has a clear and understandable system. It is simple, and customers can easily use the cashless payment method to make their payments. Since this study's primary target market is consumers who visit food service establishments, the cashless payment system is suitable for all ages, including children, the uneducated, and the elderly. In addition, the findings from [32] declared that the perceived ease of use is the most crucial factor in forming a positive attitude toward the cashless system, followed by the perception of usefulness. In addition, the findings from [33] acknowledged that perceived ease of use is partially and simultaneously important for the intention to use the cashless payment. To conclude, the findings from past literature prove a relationship between perceived ease of use and acceptance of cashless payment at food service establishments.

The last factor that plays a role in influencing the acceptance of cashless payment among consumers is perceived security. Even though perceived usefulness and perceived ease of use are important factors influencing the consumer, perceived security is the most crucial factor to consider because it is closely related to a cashless payment system. Based on [3] study, the adoption of cashless payment strongly correlates with perceived technology security. Their study may help policymakers address consumer concerns to ensure a smooth transition to a cashless society. [34] agreed with the findings and stated that the perception of security substantially impacts the desire to adopt cashless payment in the future. It is essential to be knowledgeable about the security of cashless payment to persuade the consumers to believe, trust and be confident in using the method. The findings from [35] research also noted that the rural population was willing to accept the cashless payment system, with security and transparency remaining the most important factors. In addition, [24,29] agreed that cashless payments have significantly influenced perceived security. Nevertheless, it is proven in this study that cashless payment is safe to use and has an excellent security system. It relates to the research study where increased security of cashless payment will increase consumers' confidence and acceptance of cashless payment.

The above discussion of previous literature revealed that all factors significantly affect consumers' acceptance of cashless payment at food service establishments. The data gathered in [4] study indicated that cashless payment options in Indonesia are growing. Cashless payment methods are becoming more popular, just as they are in Bandung. It demonstrates that

Bandung residents, particularly millennials, are influenced by the technology push system to use cashless payment methods. Meanwhile, [36] discovered that credit card usage influenced cardholders' lifestyles, spending habits, and debt attitudes, focusing on the impact of payment mechanisms on purchase behaviour. Furthermore, the results collected by [37] showed that all the variables investigated had a favourable link with using cashless payments. Their study may provide insight into how cashless payment service providers may provide better customer-centric services. [38] have the same thought as [37] that there is a significant relationship between the influence of cashless transactions on payment system performance, with the most impacting component being the enabling condition. Even though there are arguments from [36] research, most researchers agree with the cashless payment system.

To conclude, all factors discussed in the previous study are proven to influence consumers' acceptance of cashless payments. There is a relationship between perceived usefulness, perceived ease of use and perceived security in accepting cashless payment at food service establishments. However, the relationship of the factors depends on the setting of each study. For example, the results obtained in a study conducted in rural areas may differ from those in big cities because technological advancements are not the same in all areas.

5. CONCLUSION AND RECOMMENDATION

In conclusion, this study revealed a positive relationship between perceived usefulness, perceived ease of use, and perceived security with consumers' acceptance of cashless payment at food service establishments. The more knowledge and confidence consumers have in cashless payment, the greater the acceptance of cashless payment at food service establishments. Moreover, the researchers state that the greater the availability of internet access, the easier it is for consumers to access cashless payment. As a result, the security of cashless payment will increase consumer trust in using cashless payment, particularly in food service establishments.

The researchers hope that the findings from this study will guide and help future researchers understand more about cashless payment at food service establishments. Since cashless payments offer numerous benefits to consumers, one of the significant advantages is that consumers do not have to bring much cash, eliminating the possibility of criminal activities. Moreover, the government encouraged people to use contactless and cashless payment methods due to the Covid-19 pandemic. Consumers will soon realise that cashless transactions will gradually replace cash transactions. For example, the consumers can perform online transfers and home delivery using a debit/credit card or online banking to prevent any contact. It is critical to ensure we do not fall behind in the economy. It also shows that consumers concerned about security are more confident in using cashless payment methods. Cashless payment is especially appealing to traders because it eliminates the possibility of a shortfall that may result in a salary cut. Thus, this study can be expanded if the government, social media, and influencers raise consumer awareness regarding cash payment methods, procedures, and benefits.

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I-CReST 2022:180-160 - The Effectiveness of Enrichment Programs among Secondary Gifted and Talented Muslim Students

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ABSTRACT

Gifted and talented students have an extraordinary ability to perform or demonstrate the potential for performing at strikingly large amounts of achievement contrasted with other students at their age. This makes the students discovered the current education system is low or moderate level of practice based on their mental age. An enrichment programs are proposed to recognize the impact of capacities and ability improvement amongst gifted and talented students. In this research, we determine the acceptance of advanced syllabus on chemical analysis by using FTIR which is normally offers during undergraduate level toward secondary gifted and talented students in Kolej GENIUS Insan. A pre-test and post-test were conducted to measure students' performance in knowledge over the program. Besides that, both tests also determine the effectiveness of the enrichment program amongst gifted and talented students which related to teaching and learning aspects and the level of preference toward science.

Keywords: FTIR program; chemical analysis; pre-test; post-test

1. INTRODUCTION

Gifted and talented person is a person with higher level abilities focuses on the task commitment, creativity and general abilities [1]. Moltzen in [2] states that gifted students may show extraordinary with full of capacities. It found six areas to demonstrate on the skills conduct including general scholarly, innovative, administration, particular scholastic, visual and performing expressions, and psychomotor capacities. Gifted and talented students show the highest point of the range with an Intelligent Quotient (IQ) of 140 to 145 that shows up in the proportion between 1 out of 2000. They regularly discover the educational modules set for age-peers as opposed to unrewarding and insignificant. They can work with exciting, challenging and rewarding advanced materials.

Advanced syllabuses and enrichment programs approaches can be implemented to provide a higher quality and challenging education modules to the gifted and talented students. Davis and Rimm in [3] stated that curriculum should be extensively prepared and deeper that encounters the gifted and talented student's performances. In Kolej GENIUS Insan, students are taught sciences subjects including physics, chemistry, biology and additional mathematics in early level of secondary school. Besides that, as early 13 years old, students are exposes to the research subject. In addition, pre-university subjects are offered to students as early as 16 years old. As an enrichment program, Rahim and Ahmad Hilmi in [4] stated that NAQul InsanTM offers better understanding in teaching and learning processes. NAQul InsanTM is a

scholarly talk on the modern science that oriented on Al-Quran verses and has been implemented for gifted and talented students in Kolej GENIUS Insan since 2016.

Al-Razi Halal Action Laboratory in Kolej GENIUS Insan is equip with analysis instruments including Fourier Transform Infrared Spectroscopy (FTIR), High Performance Liquid Chromatography (HPLC), Gas Chromatography–Mass Spectrometry (GC-MS) and Polymerase Chain Reaction (PCR). FTIR is one of the instruments in analysing the identification of unknown compounds or samples, determine the concentration or amount of components in a material, analyse the consistency of sample. It is also has been used to determine the quality of olive oil through analysis of its authentication and adulteration [5] and [6]. Moreover, it was also applied for characterization of metabolic products from biodegradation of pollutants and surface characterization of multiple fiber-polymer biomaterials as this technique determines the protein adsorption, cell adhesion, and immune-response of the implanted materials in [7] and [8].

In this research, the acceptance of advanced syllabus focuses on chemical analysis using FTIR through a workshop among gifted and talented students in Kolej GENIUS Insan was investigated. Students are evaluated based on their knowledge on this topic before and after the workshop. Pre-test and post-test were conducted to observe and compute their understanding and knowledge level.

2. METHODS

In conducting an advanced syllabus among secondary school students, approaches in delivering the course should be implemented by using of co-teaching models as discussed in [9]. This research was conducted by providing a day workshop on concept of FTIR and practical session which are given by different lecturers. The level of understanding and knowledge on chemical analysis using FTIR was determine using the observation and computation through quantitative approach.

Small group of students from Kolej GENIUS Insan were participated in this research. 10 students sat for pre-test a day before the program to observe their knowledge about chemical analysis and FTIR. This pre-test consists of 15 questions – 10 multiple-choice questions and 5 structured questions including the questions in the concepts, components and properties of FTIR and also the questions on chemical analysis.

The program consists of two sessions, with the first session was the lectures on the spectroscopy and FTIR. Both lectures were delivered by the lecturer whom expert in these topics. Meanwhile, the second session was on the practical session and hands on FTIR instrument. Students were exposed to the sample preparations and conducted the chemical analysis using FTIR. The post-test was used to identify the level of understanding on chemical analysis using FTIR after the program. After the program, students sat for the post-test, which the questions were the same questions as in the pre-test. The marks from the pre-test and post-test were compared using the computation approach of SPSS. Therefore, the student's performance on the advanced syllabus have been determined.

3. RESULT AND DISCUSSION

The acceptance of the advanced syllabus among gifted and talented students in Kolej GENIUS Insan have been identified by observing the student's performance through pre-test and post-test marks. In this research, the difference marks of pre-test and post-test was calculated and after that the student's performance are observed based on the understanding and knowledge, teaching and learning aspects and also the level of preference toward science.

Based on the results of the difference between pre-test and post-test, four categories including not effective (1 to 4 marks), less effective (5 to 8 marks), effective (9 to 12 marks) and most effective (13- to 7 marks) were identified. By using descriptive statistic, the marks were analysed as in Table 1.

Table 1: Student's Performance Based on Different Between Pre-Test and Post-Test Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Effective	1	10.0	10.0	10.0
	Effective	9	90.0	90.0	100.0
	Total	10	100.0	100.0	

Among 10 students, 90% obtained the difference on their pre-test and post-test marks between nine to twelve marks which in the effective category. Meanwhile, only one student who obtained less effective mark. As the students studying advanced subject in early age, they are able to answer some of the questions during the pre-test. Based on the answers, students can obtain more corrected answers after the program that have been examined in the post-test compared with the pre-test. Most of the students obtained the correct answer on the concept and components of FTIR. Thus, it is proven that advanced syllabus is suitable for gifted and talented students that shows increasing in their performance and knowledge focuses on chemical analysis using FTIR.

In addition, this research was conducted to observe teaching and learning session of the enrichment program toward gifted and talented students in Kolej GENIUS Insan. There are nine components that have been considered including related course materials to class needs, course requirements and objective clearly explained, lecturer's expertise on the subject, lecturer's encouragement on class participation, lecturers' focuses on subject, lecturer's abilities to answer questions, lecturer's communication skills, lecturer's acceptance toward difference opinions and lecturer's teaching skills through the evaluation form. The score; extremely satisfied (5), very satisfied (4), most satisfied (3), less satisfied (2) and not satisfied (1).

Table 2: Related Course Materials to Class Needs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	3	30.0	30.0	30.0
	Extremely Satisfied	7	70.0	70.0	100.0
	Total	10	100.0	100.0	

During the program, students are provided with printed course materials that offered all the information related to the chemical analysis and FTIR. In addition, the lecture was conducted based on the information added with further explanation that makes the session easier to follow and the level of understanding was high. In Table 2, it shows 70% students extremely satisfied with the course materials that leads to the better understanding.

In the beginning of the lecture, the course requirements and objective clearly explained to the students so that students are well prepared and ready to participate. As in Table 3, seven students are extremely satisfied that the clear explanation was given the beginning of the session. Meanwhile, three students are very satisfied. This is showed that, clear explanation on the objectives of the lecture helps the students to focus and follow the session.

Table 3: Course Requirements and Objective Clearly Explained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	3	30.0	30.0	30.0
	Extremely Satisfied	7	70.0	70.0	100.0
	Total	10	100.0	100.0	

Next, lecturer's expertise on the subject is the most important aspect in teaching and learning session. This aspect will lead to the better understanding and the effectiveness of the knowledge transfer. Gifted and talented students normally tend to ask questions that required the lecturer to answer it immediately due to their high curiosity and attention on that topic. 80% of the students are extremely satisfied with the lecturer as stated in Table 4.

Table 4: Lecturer's Expertise on the Subject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately Satisfied	1	10.0	10.0	10.0
	Very Satisfied	1	10.0	10.0	20.0
	Extremely Satisfied	8	80.0	80.0	100.0
	Total	10	100.0	100.0	

Table 5: Lecturer's Encouragement on Class Participation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	3	30.0	30.0	30.0
	Extremely Satisfied	7	70.0	70.0	100.0
	Total	10	100.0	100.0	

Table 6: Lecturer's Abilities to Answer Questions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	3	30.0	30.0	30.0
	Extremely Satisfied	7	70.0	70.0	100.0
	Total	10	100.0	100.0	

Table 7: Lecturer's Acceptance Toward Difference Opinions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	3	30.0	30.0	30.0
	Extremely Satisfied	7	70.0	70.0	100.0
	Total	10	100.0	100.0	

Table 5, Table 6 and 7 shows the lecturer's encouragement on class participation, the lecturer's abilities to answer questions and lecturer's acceptance toward difference opinions respectively. These aspects showed that 70% of the students are extremely satisfied and 30% are very satisfied. Meanwhile, In Table 8 and Table 9, eight students are extremely satisfied with the lecturers' focus on delivering the lecture and lecturer's teaching skills. These aspects are important to avoid lengthy lecture and possibility for the lecturer delivering information that are not related to the topic. Lecturer should be able to attract students' interest during the lecture. Telling humour is one of the methods that can be applied during the lecture to gain interest among students.

Table 8: Lecturers' Focuses on Subject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	2	20.0	20.0	20.0
	Extremely Satisfied	8	80.0	80.0	100.0
	Total	10	100.0	100.0	

Table 9: Lecturer's Teaching Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	2	20.0	20.0	20.0
	Extremely Satisfied	8	80.0	80.0	100.0
	Total	10	100.0	100.0	

In addition, lecturer's communication skills are also an important to be considered during teaching and learning session. Lecturer should be able to speak clearly, use the appropriate words that suitable with the age of the students, body language, eyes contact and listen well. 90% of the students are extremely satisfied with the lecturer as stated in Table 10.

Table 10: Lecturer's Communication Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Satisfied	1	10.0	10.0	10.0
	Extremely Satisfied	9	90.0	90.0	100.0
	Total	10	100.0	100.0	

From the above discussion, it shows all the students are satisfied with the teaching and learning session throughout this workshop.

As shows in Fig 1, 60% of the students are extremely satisfied, 30% was very satisfied and 10% are moderately satisfied that the advanced syllabus on the chemical analysis using FTIR increase their level of preference in science. Even though Kolej GENIUS Insan provides sciences subjects in early age, the level of preference toward science subjects might differ as their ages, interests, lecturer, topics and many more. Some of students in this research are excellent students and some are average students. The level of preference might differ due to their interest.

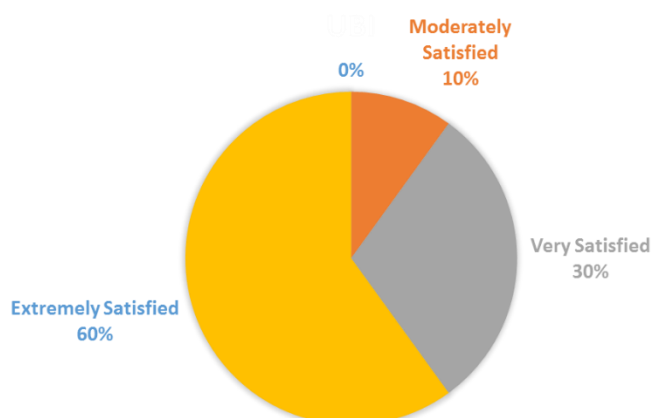


Figure 1: Students' Preference Toward Science

To identify the relationship between the acceptance of advanced syllabus and the effectiveness of the enrichment program which related to teaching and learning aspects and also the level of preference toward science amongst gifted and talented students in Kolej GENIUS Insan, correlations test is computed by using SPSS. As stated in Table 11, Pearson Correlation gave the negative values for both teaching and learning aspects and the level of preference toward science. This is indicated that there is no correlation between advanced syllabus with both aspects that have been investigated.

Table 11: Correlations Test

Correlations		different marks	Total feedback on the teaching and learning (lecture)	Is the FTIR course increase your interest in science
different marks	Pearson Correlation	1	-.147	-.214
	Sig. (2-tailed)		.686	.552
	N	10	10	10
Total feedback on the teaching and learning (lecture)	Pearson Correlation	-.147	1	.656*
	Sig. (2-tailed)	.686		.039
	N	10	10	10
Is the FTIR course increase your interest in science	Pearson Correlation	-.214	.656*	1
	Sig. (2-tailed)	.552	.039	
	N	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

4. CONCLUSION

In this research, a workshop on chemical analysis using FTIR has been identified as advanced syllabus and enrichment program through the performance of gifted and talented students in Kolej GENIUS Insan. The acceptance of the program related to teaching and learning and the level of preference toward science has been identified by using pre-test and post-test. By using descriptive statistic method, it is found that the advanced syllabus is effective to be provided to the gifted and talented students based on students' performance. Students are extremely satisfied with the teaching and learning session and their level of preference toward science are also at the higher level. However, the level of their preference toward science and the teaching and learning approaches is not related to the student's performance on the FTIR's workshop.

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I-CReST 2022:189-166 - Digital Marketing Communication and Consumers' Purchasing Decisions During the Covid-19 Pandemic

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ABSTRACT

Digital marketing communication, that is, communication between businesses and consumers using digital or electronic media, is expanding quickly, particularly during the COVID-19 period. The widespread interruptions caused by the epidemic have highlighted the advantages of digital communication even more. As a consequence of the epidemic, more than 80 percent of customers are more receptive to companies' digital products and value digital interactions with businesses more highly, according to a survey. Simultaneously, the COVID-19 epidemic has slowed globalization tendencies, at least in the medium term, creating digital communication obstacles and exposing weaknesses in the worldwide movement of people and goods. However, it has also created new digital marketing possibilities. As the modern world evolves into modern technologies, the author will examine: (a) how fast the digital marketing communication occurs; (b) the effectiveness of digital marketing communication; (c) how modern marketing communication affects recipients'/consumers' purchasing decisions; and (d) how digital marketing communication benefited the brand during the pandemic. To get a contextualized knowledge of how digital marketing works and consumer behaviors, attitudes, and purchase motives, qualitative research was undertaken. By doing this study, this paper will assist business owners and entrepreneurs in comprehending how current marketing technologies operate even in the pandemic and lockdown period.

1. INTRODUCTION

Many industrial companies are not pioneers in adopting new marketing tools and channels. As a result, industrial firms are rethinking their marketing communications strategy in light of the increasing number and complexity of stakeholders and the fragmentation of the media landscape. Our daily lives have become increasingly digitised. It has a significant impact on the way businesses and consumers conduct business in the traditional sense. According to Kaplan and Haenlein (2010), consumer behaviour is changing as a result of digitization and social media in particular, and this has important implications for businesses, products, and brands. Spending time on the internet and using social media is becoming increasingly popular with consumers (Forrester Research, 2008; Nielsen, 2012). As a result, the way people use the internet is evolving. They use online services to do everything from search to email to social media to music to video to email. Using digital marketing and social media, small businesses can expand their customer base and improve relationships with current clients. Digitalization's first step, broadband access, has already demonstrated its enormous potential for business growth and competitiveness, including the ability to reach new audiences, improve performance and efficiency, and more.

Since consumers could use their purchases from the comfort of their own homes, especially when it came to branded cosmetics, digital purchases had a significant impact on sales during COVID-19. During a pandemic, a large number of customers purchased branded cosmetics online (COVID-19). Since low-cost smartphones and low-cost data have become widely available, the global population's ability to access the internet has grown exponentially. Online channels make it simple for businesses in this scenario to connect with their target customers, build brand awareness, and sell products or services. In order to attract customers, a company must have a presence online. Consumers have the ability to compare prices and find the best deal thanks to digital tools. Customer research, brand awareness, purchase behaviour and communication, and post-purchase evaluation all play a role in digital marketing's role in the consumer purchasing process. COVID-19 has forced people to stay indoors and spend more time on the internet. Digital technology has shifted the focus of potential customers. COVID-19 has profoundly altered the way we know, think, and live our lives. Marketers and customers alike are scrambling to adjust to this bizarre new normal. The company has lost a lot of money, and it wants to stay in business. As the epidemic has spread, consumers' attitudes, behaviours, and spending patterns have changed due to the closures and widespread fear of infection.

When it comes to purchasing goods and services, consumers are looking for products and services that can be delivered at any time of the day or night. Consumers' shopping habits have been forced to change as a result of physical store closings. A new customer journey is taking place for people who were previously reluctant to shop online. Such services are now appreciated by them and they express their gratitude for the platform's ease of use. Increasingly, brands are utilising mobile and digital channels to conduct business directly with their customers (D2C). Because the factors that influence brand decisions also influence, buying local trends spread more quickly. Long-term industry growth will be aided by such a shift in consumer behaviour and business models.

1.1 Need for This Study

As a result of the COVID-19 pandemic, small and medium-sized businesses (SMEs) and even big companies were forced to close their doors following the Malaysian government's Movement Control Order (PKP/MCO) because they were unable to contact their customers. Having an effective digital marketing strategy may put small businesses at risk of serious setbacks. Because of the COVID-19 pandemic, businesses are able to interact with consumers through a variety of digital marketing platforms, making digital marketing an important part of business transactions in this era. Because of the outbreak of COVID-19, many business owners have been forced to close their doors. Digital marketing is the practise of promoting a business's products or services to potential customers through the use of digital channels. Breakthrough marketing is a type of marketing that allows new business ideas to be tested in the marketplace through direct interaction with potential customers, regardless of where they are in the world.

One of the most important current marketing strategies is customer loyalty. This is because it ensures the financial success of a company as well as the advantages of its loyal customers, as well as both parties' profit (Margarita, 2016). Customers' awareness is only the first step toward successful online business in Malaysia, as success is determined by how well e-businesses adapt and operate long-term, sustainable relationships with loyal customers. With a high level of customer loyalty comes a direct connection to the digital marketing platform. Because of the way social interaction can occur when live chat welcome messages are sent to online directions, online customers and online businesses have forged a strong relationship

because of the way social interaction can occur when live chat welcome messages are sent. In addition, customers can engage with online business postings by liking, sharing, and commenting on them. Content on brand pages that is shared as posts and displayed in the site's timeline allows users to see not only images of products but also product descriptions from the content on those pages. Consequently, this study concludes that high interactivity customer engagement leads to direct contact with digital marketing platforms such as social media platforms.

To customers, social media represents a brand's true self, rather than an image management exercise. Enhances brand perception, increases customer loyalty, and influences the purchasing decision-making process through this form of connection (Hutter et al., 2013). When an individual's experiences become more powerful, they are more likely to follow through on their behavioural goals (Ajzen, 1991). When it comes to forecasting sales and deciding what actions to take to influence consumer buying behaviour, marketing managers rely heavily on the information provided by consumers in order to predict future sales and determine how actions they take can influence consumer buying behaviour.

1.2 Background

The development of electronic devices and equipment, as well as the development of marketing practises, have facilitated this effect in the business world (Chen & Lin, 2019). Digital marketing practises have taken over the world of marketing. A marketing practise is considered digital if it is implemented using a digital medium, according to the definition. When digital delivery technology is used to establish customer-marketer relationships, marketing communications become digital as well. Digital communications are used by marketers to provide their customers with direct communication via digital delivery technology (Bird, 2007).

Consumers around the world recognise the importance of digital media in influencing their purchasing decisions in a variety of product categories. There is strong evidence that both parties participate equally in digital marketing communications. Consumer purchasing behaviour is being influenced by digital channels in one way or another. Consumers, on the other hand, use digital media to exert influence over product categories such as clothing and fashion, books, and accessories by conducting product searches and providing their feedback and recommendations (Kink & Hess, 2008). Research has yet to back up this evidence in particular, the impact of digital marketing on the volume of consumer decision-making processes. Research in the cosmetics industry has focused on the offline factors that influence the purchase of branded cosmetics. Consumer purchasing decisions are influenced by a variety of factors, including the cost of branded cosmetics, recommendations from friends and family, and access to credit (Sudhahar & Venkatapathy, 2005).

Even though it's a specialised study, the findings of Hutter, Hautz, Dennhardt and Füller (2013) show that modern technology presents new challenges and opportunities for marketers in the branded beauty market because of the influence of digital communication on customers' purchasing decisions. Because the effects of digital technology use in marketing communications have yet to be confirmed, marketers need to know exactly how technology can influence purchasing decisions. Consumers now have a great deal of say in how their purchasing decisions are made. For them, this has resulted in a re-creation of value in the form of education and entertainment (Prahalad & Ramaswamy, 2004b). A study found that the value

customers received from online searches increased when a list of factors, including better matching, increased awareness, time efficiency, transparency in pricing, crowd matching, problem solving and entertainment, was provided. was presented. (Bughin et al., 2011).

1.3 Objectives

This research paper aims to discover the impact of digital marketing communication and consumers' purchasing decision during the COVID-19 pandemic by focusing these following specific objectives:

- To draw the outcomes of using the digital marketing during the pandemic COVID-19
- To investigate the effects of digital marketing towards consumers' purchasing behaviour
- To find out how the digital marketing communication connects business owners and consumers

1.4 Research Question

- RQ1: What are the outcome of using digital marketing communication during the COVID-19 pandemic?
- RQ2: How far the digital marketing affect consumers' purchasing behaviour?
- RQ3: How does the digital marketing communication connects business owners and consumers?

2. RESEARCH METHODOLOGY

The data collection methods used in this study classify it as a descriptive study. Finding meaning, explaining hypotheses, and determining how frequently something occurs are all reasons to use descriptive research design. Customers and marketers alike prefer to communicate via digital marketing channels, according to the literature. To determine the sample size, researchers should use the population proportion approach if they want to know the population's proportion rather than its average value (Dash, 2012). Research objectives are clearly defined and this study shows the impact of digital marketing communication across urban as well as semi-urban locations across various population types, such as different income groups, different educational levels, and various occupations. All are made up of various subgroups of respondents who communicate primarily through digital means.

Users of social media sites like Twitter, Instagram, and Facebook were chosen at random for this study. A simple sampling method was used in this study's data collection. In the case of researchers with a large population and limited time, facility sampling is the simplest sampling method because it randomly selects samples. Research can take any person from the sample that is free to answer a questionnaire on social media platforms like Twitter, Instagram and Facebook who is voluntarily answering it thus can also get respondents to respond quickly because respondents have the ability to answer questionnaires online and send them directly at the time they are being completed. Nominal, ordinal, and interval measures of variables were all employed in this investigation. In order to conduct a survey, Google Forms was used to randomly distribute questionnaire forms to users of the site.

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I-CReST 2022:190-188 - Factors Influencing Household Waste Management Behaviour in Shah Alam

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ABSTRACT

Sustainable household waste management has long become a priority for policy makers and relevant stakeholders in Malaysia. As one of the topmost criteria towards moving from developing to developed nation, this country is still struggling to find the right formula to encourage recycling as part of its community habit. This study hence attempted to examine factors influencing current household waste management, placing emphasis on recycling behaviour among Malaysians. The Theory of Planned Behaviour was modelled in examining how these factors are able to predict recycling behaviour. Questionnaire survey method was used in collecting primary data. Samples were selected using simple random sampling which yielded 127 usable responses. In assessing factors influencing recycling behaviour, linear regression analysis suggested that perceived facility condition, prior recycling knowledge, and attitude have significant and positive impact on the extent of recycling behaviour among respondents. Among these, prior recycling knowledge was found to be the strongest factor. In contrast, subjective norms and awareness were found to have no significant influence. This study hopes to help policy makers, waste management strategists, local administrators, and researchers in the field to formulate sustainable policies, and identify further areas of study in the relevant field.

Keywords: Waste management; recycling behaviour; Theory of Planned Behaviour; household waste; sustainable management

1. INTRODUCTION AND RESEARCH OBJECTIVES

In 2012, global municipal solid waste output was anticipated to be 1.3 billion metric tonnes, with a projected increase to 2.2 billion metric tonnes by 2025 (Hoornweg & Bhada-Tata, 2012). The majority of municipal solid waste intake comes from household solid waste (HSW).

Despite several attempts by the government, such as enactment of new laws and pursuing privatisation, Malaysia is still lagging behind significantly in sustainable waste management practices, particularly in the area of recycling. Paper, plastics, and bottles are the three categories of recyclables in Malaysia, although relatively little of the garbage gets recycled. In Kuala Lumpur, for example, the current recycling rate is 4.5 percent of total garbage generation. It was planned to raise it to 16 percent by 2005 and 20 percent by 2020 (Chen et al., 2021). It has been forecasted that Malaysia is on target to fail miserably of its 2020 objectives of diverting 40 percent of garbage from landfills and improving their recycling rates to 22 percent.

It is mandatory for Malaysians to segregate solid waste which has been set by the government since 1 September 2015. This execution is in accordance with rules under the Solid Waste and Public Cleansing Management Act 2007, according to the Ministry of Housing and Local Government (Act 672). Malaysia's present waste management practises, however, are unable to reduce the disposal rates. Waste reduction via the 3Rs programme (reduce, reuse, and recycle) is still in the planning stages. The status of municipal solid waste (MSW) remains mixed and moist (Chua & Bashir, 2020). South Korea and Singapore have recycling rates of 53.7 percent and 34 percent respectively, in contrast to other Asian nations (Harizah, 2021).

According to Das et al. (2019), there are few main issues related to waste management, first is waste generation, where there is an increase of waste at a rate that is unexpectedly high. This is attributed to the lack of environmental awareness among the public which leads to an inappropriate method of garbage disposal. There is also not much difference between income or standard of living, which evidently higher income groups tend to refuse to participate in managing their waste properly, while those in poor and marginalised countries would not have the proper infrastructure to manage their waste.

Malaysia as a developing country had definitely experimented with solid waste management since 1988, but it had so far been lacklustre which had prompted the Malaysian government to introduce compulsory waste segregation in June 2016 with penalties to those who do not comply. There was also the Solid Waste Management and Public Cleanliness Corporation (SWCorp) which was responsible for various initiatives to promote good solid waste management among the public. In 2020 the recycling rate is only at 17.5 percent, a drastic change is required in order to achieve a rate of 22 percent (Yoke et al., 2019).

Households must separate their garbage into recyclable and non-recyclable commodities including plastic, paper, metal, aluminium, glass, and e-waste (general wastes). Failure to comply with the requirements will result in a fine of not more than RM 1000 (Solid Waste and Public Cleansing Management Act, 2007). However, there has been no data that can directly evaluate the contributions of Malaysia's waste segregation programme since its implementation. Nevertheless, the topic of waste recovery in Malaysia has always been swept aside in terms of its urgency as the matter has yet to be grasped by the general public, and this needs to end. For that reason, further understanding of the issues and possible positive impact of sustainable household waste management through recycling efforts should be gathered and empirically tested.

Using the fundamentals of the Theory of Planned Behaviour (TPB), this study puts an emphasis on personal context to identify its key antecedents towards recycling behaviour among Malaysians. This study was hoped to narrow down the knowledge gaps and furnish useful information and strategies in helping policy makers by providing answers to the emerging research question: What factors functioned as key determinants of recycling behaviour among Malaysians?

2. LITERATURE REVIEW

Previous researchers had investigated various recycling drivers that can potentially impact waste management efforts in Malaysia. Access to recycling, home recycling practices, recycling cost, willingness to adopt recycling practices, environmental impacts, roles of religion, rewards & incentives and charity purpose is the driver identified by Tiew et al. (2019)

on recycling behaviours between regular recyclers and non recyclers in Malaysia, which interestingly find that Malaysian both those recycle and not, had made it clear reward and incentives is not the reason for them to recycle. Meanwhile, environmental impact and attitude would be considered the biggest factor to recycle.

Majid et al. (2021) had looked into factors that influence recycling intention among semi-dense areas residents in Johor found that attitude about recycle, perceived behavioural control, moral norm, and consequences awareness are the factor the influence recycling intention, while that still might be the case, the paper suggest continues campaign by the government agencies and introduce policy that would further encourage people to recycle.

2.1 Theory of Planned Behaviour

Developed by Ajzen (1991), The Theory of Planned Behaviour (TPB) is a theory to predict an individual's intention to engage in a behaviour at a specific time and place. The hypothesis was developed to describe all actions that people can exercise self-control over. This model's most important element is behavioural intent, which is impacted by attitudes toward the likelihood that a behaviour will result in the desired outcome and a subjective assessment of the risks and advantages of that outcome. Previously it had been used to explain health behaviours of people including smoking, substance use, drinking and many more.

According to the theory, behavioural success is a function of both ability (behavioural control) and motivation (intention). It makes a distinction between the behavioural (attitude), normative (subjective norms), and control (perceived behavioural control):

i. Attitude

It focused on personal belief that an individual is able to influence his or her ability to practice recycling efforts in daily life. It entails a consideration of the outcomes of performing the behaviour.

ii. Subjective Norms

It referred to descriptive measures of internal and external beliefs. It can be mostly related to social peers or people of important views and beliefs on recycling behaviour, either it is a social norm, cultural or none at all.

iii. Perceived Behavioural Control

This is the perspective of a person's assessment on how simple or difficult it is to carry out the desired conduct. A person's views of behavioural control change depending on the scenario because perceived behavioural control differs across contexts and behaviours. The Theory of Planned Behaviour replaced the Theory of Reasoned Action as a result of the addition of this theory construct.

It focused on the environment of the individual's external factors that might affect him and her, for instance perceived facility condition and recycling knowledge.

2.2 Hypothesis Development and Conceptual Framework

The individual or group effort to practise sorting, preparing and storing household waste is what is classified as recycling behaviour (Tonglet et al., 2004). A paper by Ittiravivongs (2012)

mentioned that recycling behaviour is influenced by recycling intention, habit, recycling ability, facility condition and adequacy of recycling information significantly which also in the paper finding that recycling habit to be a biggest influence on recycling behaviour. In a paper by Latif, Osmar and Bidin (2018) recycling behaviour is heavily influenced by the public accessibility to a structural and institutionalised program that makes recycling effortless and convenient, this situational factor which was a finding that indicated to be a major obstacle to recycling behaviour in their research and past literature.

2.2.1 Attitude

According to Theory of Planned Behaviour by Ajzen (1991), the function of three belief determinants include the attitude of the behavioural belief, subjective norms of the normative belief, and perceived behavioural control of the control belief. A person's overall subjective norms represent his perception of how significant other people expect him to act regarding the behaviour and evaluation of performing a certain behaviour is what attitude is referred to (Park & Ha, 2014). According to Hameed et al. (2021), a consumer's positive attitude toward recycling plastic waste leads to a desire to recycle plastic waste. Wang, Guo and Wang (2016) also found out that attitude has a positive relationship with behaviour intention, but the paper adds that this requires a cultivation from programs such as environmental campaigns and a belief that other residents are also participating in the betterment of the environment and society. Hence, hypothesis H_1 was developed to identify whether attitude predicted recycling behaviour.

H_1 : Attitude have significant positive relationship towards recycling Behaviour.

2.2.2 Subjective Norm

Subjective norm is the perception of social pressure from important others, which can be a person's significant other, family, friends, society or even just someone important to the person. The perceived pressure from significant others to perform (or not to perform) the behaviour would influence behavioural intention. Subjective norm is a part of the mediation for theory of planned behaviour by Ajzen (1991) that causes behavioural intention. In one paper finding that subjective norms have a positive relationship with recycling behaviour, it was the weakest among the theory of planned behaviour's predictor (Mannetti, Pierro, & Livi, 2004). Wan, Shen and Choi (2017), also Thi Thu Nguyen et al. (2018) had found that recycling intention would be high with a strong subjective norm, the study further elaborate that if the peer and society encourage recycling, individual will likely perform recycling without expectation of a reward and if there is enough social pressure, it will likely encourage individual to recycle. Hence, hypothesis H_2 was developed to identify whether subjective norms predicted recycling behaviour.

H_2 : Subjective norms have significant positive relationship towards recycling behaviour.

2.2.3 Perceived Facility Condition

Rogoff and Williams (2012) define that recycling facilities consist of various activities such as collection, material recovery facility, combustion landfill, and transportation. Zhang (2016)

mentioned that the lack of an effective facility not only limits the ability to recycle physically, but it also lowers people's expectations about how their recycling intentions would be realised. In other words, physical and psychological access to good infrastructure influences the realisation of recycling behaviour. In the same paper one of the key causes for China's predicament in domestic garbage recycling is a lack of effective and convenient recycling facilities. First, China lacks a national standard to guide municipal solid waste sorting, resulting in disparities in sorting standards across the country. People may be confused by the variety, which may prevent them from creating a consistent view and habit regarding how to sort waste for a more effective recycling result (Zhang et al., 2016). Hence, hypothesis H₃ was developed to identify whether perceived facility conditions predicted recycling behaviour.

H₃: Perceived facility conditions have significant positive relationship towards recycling behaviour.

2.2.4 Recycling Knowledge

Another important variable in recycling behavioural studies is knowledge. Concrete knowledge shapes recycling behaviour on the one hand, while abstract knowledge may be an important predictor of pro-environmental behaviour on the other (Chung & Lo, 2004). In Iran, Abadan residents were polled via a questionnaire survey of 2400 people to assess their knowledge, attitudes, and practises regarding solid waste reduction, source separation and recycling, collection, and willingness to pay for solid waste services (Babaei et al., 2015). The study also looked at the relationship between demographic factors and knowledge of solid waste management. According to the data analysed, the studied community had a very positive attitude toward participating in solid waste source separation and recycling plans. The respondents, on the other hand, not only lacked intimate knowledge of the various steps of solid waste management, but also lacked the ability to put these steps into practice .

People don't recycle for a variety of reasons, including a lack of awareness about what can and cannot be recycled, as well as cumbersome recycling facilities. The findings of a quantitative national study suggest that elements such as in-house source separation management, as well as the essential knowledge and an accessible recycling facility, would increase household recycling (Strydom, 2018). Hence, hypothesis H₄ was developed to identify whether recycling knowledge predicted recycling behaviour.

H₄: Recycling knowledge have significant positive relationship towards recycling behaviour.

2.2.5 Awareness

Public awareness is a crucial part of waste management development, as it has been appearing in political agenda which aim to address climate change, resource and waste management. (Wilson, 2007).

Wang et al. (2020) studied the urban Chinese population, many of them are aware of the major threats of household solid waste, which include environmental pollution, health risks, and crisis of resources. But it seems that recycling knowledge among the respondents was quite low, while that seems to be the case, those respondents still show willingness or at least want

to try and participate in proper waste management practises. The study also suggests an increase in solid waste education and a better policy regarding solid waste management.

Al-Naggar, Abdulghani and Al-Areefi (2019) looked into Malaysian knowledge, attitude and practice on inappropriate waste management, the majority of the respondents are aware of the risk and the type of disease it brings. Most Malaysians also say that they should segregate (type of waste like plastics, glass and domestics) to help better manage domestic waste. While many claim their main source of information on waste management is electronic media. While it seems to be that many are knowledgeable, findings in how often Malaysian practices appropriate waste management is mixed, with many only practising it sometimes while there seem to be a portion of them rarely or never practising appropriate waste management. Overall findings Malaysians in general have moderate awards of waste management, as it is even recommended that education can be the key to further improve their awareness, especially future generations.

According to Yoke et al. (2019), a result from government initiatives and public awareness on sustainable environment survey had found that the level of awareness among Selangorian are moderately aware of recycling initiatives.

Tiew et al. (2019) made a comparative study on recycling behaviours between regular recyclers and non recyclers in Malaysia. They found that Malaysians strongly believe that recycling would help reduce many of the climate issues. But this finding contradicts with their keenest to participate in recycling activities. Hence, hypothesis H₅ was developed to identify whether awareness predicted recycling behaviour.

H₅: Awareness have significant positive relationship towards recycling behaviour.

Conceptual framework that was developed for the purpose of the current study is depicted in Figure 1.

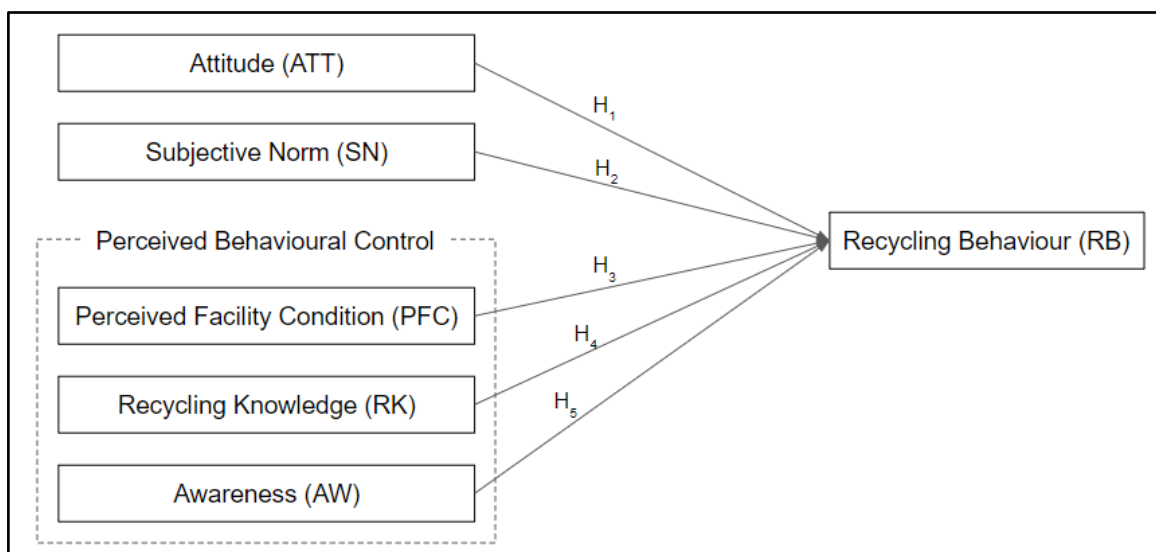


Figure 1: Factors that drove recycling behaviour among Shah Alam residents

3. METHODOLOGY

The population of this study involved individuals residing in Shah Alam, Malaysia. Considering the total population (481,654) in this city, this study employed simple random sampling due to its efficiency in avoiding misrepresentation of population members (Sekaran, 2003; and Hussey & Hussey, 1997). After further calculations and reference from Krecjie and Morgan (1970), this study was able to decide on a sample size of 384 residents in Shah Alam.

In testing the theoretical model and associated hypothesis, a questionnaire was conducted with carefully structured questions chosen after doing considerable test to elicit dependable reply from the sample (Hussey & Hussey, 1997). Questionnaire for this study was adapted from Ittiravivongs (2011) to be studied within a Malaysian context. This instrument included the demographic information of respondents, as well as statements representing six variables that were being empirically tested for this study.

Combinations of open and closed-ended questions were asked and organised as below:

i. Demographic Information

Questions in this section consist of close-ended questions that sought information on respondents demographics, such as gender, age group, education background, marital status, and employment status. This section also engaged with respondents' geographical structure, looking into the area where they are living in, as well as the efficiency of the waste management system within their area. This would help the current study to identify how household waste is being managed differently between urban, suburban and rural areas.

ii. Drivers for Recycling Behaviour

This section represented the measurement of independent variables influencing waste management, which placed focus on respondents' recycling behaviour. Applying the concept of the TPB model, this section classified five variables. For each variable, respondents were asked to rate their agreement towards four reflective statements. Close-ended statements were then developed using a 6-point Likert scale. Response categories varied from (1) Strongly Disagree to (6) Strongly Agree. Interpretations of close-ended questions were much easier as the questions were standardised and therefore could easily be analysed. Besides, less time was needed in completing the questions. The respondents were required to select a response that would closely represent their viewpoints for the statements provided in the questions.

iii. Recycling Behaviour

For recycling behaviour, respondents were asked to rate their agreement towards four reflective statements. Close-ended statements were then developed using a 6-point Likert scale. Response categories varied from (1) Strongly Disagree to (6) Strongly Agree. Respondents were required to select a response that would closely represent their viewpoints for the statements provided in the questions.

Digital version of the questionnaire was created using Google Form, where the link to this Google Form was sent out to 384 residents of Shah Alam via multiple Whatsapp groups. Respondents were informed that participation was voluntary, that they could withdraw from the study at any time, and that confidentiality was assured. Moreover, they were informed that the purpose of the project was to investigate public awareness on household waste

management. The survey took approximately 20–30 minutes to complete. Only one reminder of participation was circulated, and those who did not consent to the study were excluded from analysis.

A total of 130 responses were completed and reverted, which gives the current study a response rate of 33.85 percent, with 100% active response rate. Concurring with Saunders, Lewis and Thornhill (2012), the major cause of non-response to this questionnaire was due to the selected respondents refusing to have any involvement towards the current study, but did not give a reason.

According to Baruch (1999), a response rate of approximately 35 percent can be considered to be reasonable for studies which involve representation of a population. Neuman (2005) had also considered response rates of between 10 and 50 percent for distributed questionnaires to be reasonable. Further, Saunders, Lewis and Thornhill (2012) and Sileyew (2019) had argued that a response rate of 20 percent is acceptable. After looking into previous literature, the current study proceeded with analysis using 130 responses.

In the current study, data coding and analysis were done by Statistical Package for Social Sciences (SPSS) version 21. At the analysis stage, appropriate descriptive and inferential statistics were used. According to Zikmund (1994), the statistical method chosen depended on measurement scale, number of variables, and type of questions. Keller and Warrack (1997) stated that knowing the type of data being measured was important because it determined the type of statistical techniques. In analysing the data, this study focused testing the hypothesis developed for the research.

4. DATA ANALYSIS AND FINDINGS

In seeking the empirical evidence on the factors influencing recycling behaviour, the theoretical model of the study led to the development of five hypotheses.

Table 1: Summary of Hypothesis Testing

Hypothesis	Causal Relationship	B¹	P²	Result³
H ₁	ATT → RB	0.275	0.010	Accept
H ₂	SN → RB	0.024	0.797	Reject
H ₃	PFC → RB	0.121	0.069	Accept
H ₄	RK → RB	0.446	0.000	Accept
H ₅	AW → RB	-0.005	0.961	Reject

¹Regression Coefficient

²Statistical Significance of the Test ($\alpha = 0.10$)

³Results on Hypothesis Testing

In assessing factors influencing recycling behaviour, linear regression analysis suggested that perceived facility condition, prior recycling knowledge, and attitude have significant and positive impact on the extent of recycling behaviour among respondents. Among these, prior recycling knowledge was found to be the strongest factor. In contrast, subjective norms and awareness were found to have no significant influence. Details of analysis for each hypothesis were discussed next.

Analysis in Table 1 showed that attitude had a significant positive influence on recycling behaviour ($p < 0.10$). The estimate of standardised regression weight ($\beta = 0.275$) showed that

when attitude increased by 1 standard deviation, recycling behaviour increased by 0.275 standard deviation. As a result, H₁ was accepted.

In looking at the influence of subjective norms on recycling knowledge, Table 1 demonstrated that subjective norms were not able to explain the variance in recycling behaviour significantly ($p > 0.10$). Thus, H₂ was rejected.

Perceived facility condition demonstrated a significant positive relationship towards recycling behaviour ($\beta = 0.121$), ($p < 0.05$). Thus, H₃ was accepted. The current study hence found that perceived facility condition influenced recycling behaviour.

The result in Table 1 signified that recycling knowledge had a significant negative relationship with E-business usage ($p < 0.10$, $\beta = 0.446$). Thus, H₄ was accepted. An increase that was observed in recycling knowledge by 1 standard deviation had resulted with recycling behaviour to increase by 0.446 standard deviations. This signified that higher level of knowledge would result in higher level of recycling behaviour.

The current study however found that no significant relationship existed between awareness and recycling behaviour ($p > 0.05$, $\beta = -0.005$). Thus, H₅ was rejected.

5. CONCLUSION

In conclusion, the outcomes of this investigation are corroborated with previous research. The findings of this study can provide useful insights to the government, policy maker and any relevant stakeholder in Malaysia. Not only useful for the government, the findings also can be useful for the private sector as too many of them are involved with recycling issues. Besides, findings from the current study can also serve as useful information for e-commerce startups to consider in ensuring the minimization rate of waste management in Malaysia. Furthermore, these findings would encourage fellow Malaysians and e-commerce startups to be invested with recycling initiatives in hopes of making mobile applications from it. To thrive in today's hypercompetitive market, a quick response to rapid changes in the business environment is required (Intan Salwani et al, 2009). Firms should consider the opportunities and risks of transforming their traditional business into a web-based business in order to compete in the global business environment, which could result in higher profit maximisation (Paynter & Lim, 2001).

The findings of this study strongly showed that the respondents have prior recycling knowledge. They are aware of the benefits of recycling and the aim of recycling, however only a small percentage of respondents recycle on a regular basis. The majority of respondents cited a lack of facilities for trash separation as their main concern, and several added that they were too busy to practise recycling. Nowadays, residents are referring to online applications if they want to do any transactions. Especially cashless and contactless interactions have seen dramatic improvements in a future full of technological sophistication.

Perceived family conditions are found as significant variables towards the household waste management behaviour. However, the community, which includes family and friends, may deliver information about recycling since those who do it typically remark that they have the biggest effect on recycling resources. Likewise, most of the respondents listed a lack of facilities as one of the primary reasons for not recycling, and the authorities should provide

additional recycling facilities. Each residential area should adopt this recycling practice, by providing facilities in each of them.

Furthermore, the result of this study shows that attitude is found as a significant predictor. This means that the respondents have a willingness to practise recycling, but they feel that recycling waste is time consuming. Most of the respondents are finding recycling information oftenly around them. Nowadays there is a lack of information about recycling in Malaysia. One of the most successful ways to encourage recycling among households is through television. People might be informed about the recycling effort by watching television. In other words, this study implies that the educational environment is one of the most important starting points to begin promoting recycling in general life.

Moreover, Malaysia nowadays towards the online applications practising, most of the businesses can grab this opportunities to promote their brand. Following the findings of this study, strong emphasis must be given to Web functionality to facilitate online recycling transactions. It is important to have a team of experts with IT professionals overseeing the firm's E-business activities. Online application would also help to connect multiple recycling businesses with various stakeholders including authorities and public via superapp which is similar to what Grab or TouchnGo offers. Not only that, but this application also intends to apply technology in creating a community currency which can help to stimulate the local community and encourage cashless payment services. Meanwhile, it also comes as an e-commerce platform which can benefit both users and vendors according to transactions made within this platform.

This study had placed its prime focus on Shah Alam residents as a unit of analysis. As a result, the findings may not be completely relevant to other service industry sub-sectors. Future researchers are urged to pursue more exploratory ideas and notions addressed in this paper. Recommendations for prospective future study include empirical studies that use large datasets from Malaysia to identify cross-state disparities with regards to this issue. Further research might be conducted on the possible link between non-significant variables that have the potential to generate indirect correlations in predicting recycling behaviour.

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I-CReST 2022:194-207 - Stress Management of Online Academic Learning Among Students

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ABSTRACT

This study was conducted to identify stress management among students of Universiti Sains Islam Malaysia (USIM). In addition, the study aimed to determine the relationship and factors between online academic learning on stress management. The study sample involved respondents consisting of bachelor's degree students from various faculties. The data obtained were analyzed using Statistical Package for Social Science (SPSS) and SMART PLS software, including descriptive data, correlation analysis, regression analysis, and mean scores used to determine the factors driving stress management as a dependent variable. The findings of the study indicate that factors influencing stress management among respondents related to online academic learning.

Keywords: Stress management; online academic learning; students

1. INTRODUCTION

For a long time, face to face method has been the practiced of teaching and learning in Malaysia be it at the school level or the tertiary level. However, when the Covid-19 hits the world, the education landscape has changed dramatically worldwide, including in Malaysia with regard to the implementation of teaching and learning. Covid-19 is a newly discovered infectious coronavirus that spreads from one person to another through droplets. The virus emerged in December 2019 and was first discovered in Wuhan, China. In January 2021, it was declared as a public health emergency of international concern. In an attempt to control the spread of Covid-19, the government of Malaysia as well as in other parts of the world took the initiative to close all educational institutions. Due to the closure of the institutional educations, the face-to-face teaching and learning can no longer be implemented.

In order to ensure that the students are not left behind in education, the Ministry of Education (MoE), Malaysia came out with the solutions to implement the online home-based teaching and learning method. Since then, the online teaching and learning became the 'new normal' of the learning process at the educational institutions. Even though online learning was the best option pertaining to teaching and learning approach that the Covid-19 pandemic has to offer to the students, it is seen as a challenge not only for parents but also to the teachers

and students themselves in facing various challenges. The surge of using electronic gadgets for instance, has led the students to spend more time facing the laptops, computers, smartphones and tablets. The increase in exposure to smart devices has been proved to increase stress and burnout levels (Mheidly, Fares & Fares, 2020). As a result, over the past decade, studies exploring stress and burnout in the educational and occupational settings were published extensively.

Stress is the cause of almost all problems involving mental health. Moderate stress can have a positive effect because stress is able to help the body and mind to work properly. In fact, too much stress will have a negative impact on one's health and achievement especially to students. Among the factors that caused students to experience stress was the factor of online learning at home during the COVID-19 pandemic.

Specifically, this study was conducted to answer the following questions:

1. What is the level of academic load and the level of student stress?
2. Is there a relationship between stress management and online academic learning?

This study aimed to examine the level of academic loaded and its relationship with stress management among undergraduate students at USIM.

2. LITERATURE REVIEW

According to the study conducted by Mheidly, Fares & Fares (2020), it is shown that the exposure to computer and smartphone screens is associated with a lot of stress-related symptoms. The symptoms can appear in the form of psychological and cognitive and to have a serious impact on the students' quality of life and daily function. In a similar study to online learning, which is the distance learning, Murdhiono et. al. (2022) found that the students are required to be more creative, active, and independent, alongside greater workloads as compared to face-to-face learning. In online learning, it is found that the situation can be more challenging when students lack support from peers and lecturers due to prolonged physical and social distancing policies. Students report problems with online study include material misunderstanding, poor learning outcomes, limited student-instructor engagement, and lack of online learning tool. These stressors eventually trigger academic stress among students during online learning period.

In contrast to the pandemic Covid-19, during the pre-pandemic, the digital technologies are always seen as adjacent and secondary to distance learning (Pandey et. al., 2021), whilst at the same time having potentials and well established to enhance student learning. The concept of blended learning for instance, combining the benefits of face-to-face and online teaching which gradually being integrated into institutions (Dziuban et al. 2018), and digital technologies are clearly integral to the future of university education around the world (Henderson et al. 2017). Nonetheless, as a result of sudden emergence of Covid-19, there are a lot of unforeseen challenges with regards to online teaching and learning including, lack of experience, lack of time preparing for the teaching, as well as support with regards to technology (Bao, 2020). Meanwhile, on the students' side, the challenges are even worse when there are wide range of distractions of studying at home including difficulty to find spaces for home learning, insufficient hardware as well as unstable networks (Zhang et. al, 2020).

In terms of psychological effects, according to Wang et al. (2020), students may be experiencing from the outbreak of Covid-19 including anxiety, fear, and worry, among others. The study is supported by Cao et. al (2020) that compared to prior academic terms, individuals in the following term were more sedentary, anxious, and depressed. In addition, Huckins et al. (2020), suggested that wide variety of behaviours, such as increased phone usage, decreased physical activity, and fewer locations visited, are associated with fluctuations in Covid-19 news reporting. Elmer's et al. (2020) in their study suggested that some students could be at higher risk of social isolation and the development of mental health problems as the consequences of living by themselves, having less direct contact to close family members and friends, receive less social support as well as less social network.

It is noteworthy that the effects of prolonged exposure to telecommunication can also affect physical health. Mheidly, Fares and Fares (2020) attested that observing screens and using the smartphones for extended periods of time leads to physical harm. The study also found neck pain to be a prominent problem among adolescent and paediatric users, mainly due to the prolonged and distorted positioning when using these devices. Specifically, bending the neck when using digital screens and smartphones may progressively lead to stresses on the cervical spine; a condition known as "iHunch." It may also strain the ligaments, muscles, and tendons of the vertebral column. Recognizing stress and burnout resulting from the online learning during pandemics is necessary to develop effective mitigation strategies (Yusof & Azman, 2013; Miskan, & Fisol, 2021). Smart devices have grown its popularity, widely used in teaching and learning as well as becoming an integral part of every students, and accordingly, research on its effects is necessary to be able to reap the benefits of this technology in a safe and healthy manner.

From the impacts shown in the previous studies, it is evident that management are important to reduce academic stress in students (Murdhiono et al., 2022). However, research on management with regards to academic stress has been limited. Research on academic stress management is urgently needed to mitigate stress in students, particularly in the Covid-19 pandemic. It is believed that such research will be able to provide more detailed mental health management guidelines for students learning. This study contributes to a limited literature by evaluating several components of management and respondent characteristics on students' academic stress during the Covid-19 pandemic at the Universiti Sains Islam Malaysia (USIM). The hypothesis as below:

H0: There is no significant relationship between academic load and stress management.

H1: There is a significant relationship between online academic learning and stress management.

3. RESEARCH METHODOLOGY

This descriptive study uses a quantitative approach that involves a survey process through questionnaires to collect data. The study data collection method was chosen because the researcher was able to get a general picture in descriptive and quantitative form (Fraenkael & Wallen, 1994). This is intended to obtain an overview of information on the level of time management and stress among Masters students at USIM.

This study uses the formula of Fidell et. al., (2013) which is $N > 50 + 8m$. The number of samples used was 233 respondents to obtain significant results. This study uses a simple

random sampling method or "simple random sampling" which this method is applied to Bachelor's Degree students. The sample for this study consists of undergraduate students who are studying full-time at USIM from faculties such as the Faculty of Economics and Muamalat (FEM); Faculty of Syariah and Law (FSU); Faculty of Science and Technology (FST); Faculty of Leadership and Management (FKP); Faculty of Primary Language Studies (FPBU); Faculty of Quran and Sunnah Studies (FPQS); Faculty of Engineering and Built Environment (FKAB); Faculty of Dentistry (FPG); and Faculty of Medicine and Health Sciences (FPSK). Sample selection for this study was made based on cluster random sampling.

The questionnaire used in this study consists of two sets of questionnaires, namely the Online Academic Burden Scale and the Student Stress Scale to measure the variables studied. This scale uses 5 Likert scales namely Never = 1, Rarely = 2, Sometimes = 3, Often = 4 and Very Often = 5. Both of these questionnaires have a high internal consistency of 0.880 Cronbach's Alpha for the Scale academic and 0.940 Cronbach's Alpha for the Student Stress Scale where it is a high level of item reliability (Mohd Majid Konting, 1994). It can be concluded that values above 0.80 are considered very good.

4. RESULTS AND DISCUSSION

Data analysis in this study used Statistical Package for Social Science (SPSS) 27 for Windows and SMART-PLS. The process of analyzing involves two types of statistics, namely descriptive statistics and inferential statistics. The descriptive statistics used in this study are the mean and standard deviation to describe the study sample's profile of academic load and stress levels. In comparison, inferential statistics are used to examine the variables' differences, contributions and relationships.

Demographic analysis data such as Table 1 explain respondents' gender, faculty and residence backgrounds.

Table 1: Demography

Variabel	Sample	N	Percentage (%)
Gender	Male	74	31.76%
	Female	159	68.24%
Faculty	FEM	61	26.18%
	FSU	52	22.32%
	FST	7	3.00%
	FKP	10	4.29%
	FPBU	81	34.76%
	FPQS	7	3.00%
	FKAB	2	0.86%
	FPg	3	1.29%
	FPSK	10	4.29%
Location	City	116	49.79%
	Rural	89	38.20%
	Suburbs	28	12.02%

To answer the online academic learning questions, 10 questions were submitted to the respondents. The study's results found that the mean value of each question above reached a moderate value.

Table 3: Academic Online Learning

No.	Item	Min	Sisihan Piawai
1	I believed that academic assignments were unclear.	2.423	0.887
2	I had to compete with a colleague to get superior achievements.	2.933	1.135
3	I did not attain the desired success of achievement.	2.903	1.027
4	I have a heavy academic load.	2.913	1.083
5	I felt the assignment was given in a short period.	2.623	1.068
6	I was bothered with unsatisfactory exam results compared to other colleagues.	2.803	1.188
7	I am not enthusiastic about online learning.	2.483	1.118
8	I was unable to thoroughly prepare since there were too many things to study.	2.923	1.117
9	I frequently create final tasks for academic classes.	2.862	1.163
10	I am having internet access problems that make online learning difficult.	2.492	0.965

To answer stress management, a total of 10 questions were posed to the respondents. The results of the study found that the mean value of each question above reached a moderate value. This indicates that respondents agree with stress management.

Table 4: Stress Management

No.	Item	Min	Sisihan Piawai
1	I cannot manage stress well.	2.433	0.998
2	I have trouble making decisions.	2.753	1.045
3	I think negatively in any situation.	2.222	0.942
4	I will experience prolonged feelings of depression as a result of related problems.	2.232	1.032
5	I felt very tired physically and mentally after studying.	2.773	1.062
6	I feel discouraged when I cannot complete a task.	2.803	1.082
7	I was unable to control my feelings and emotions.	2.362	0.947
8	I cannot handle problems well which cause me stress easily.	2.422	1.018
9	I have too many responsibilities that I have to take on when being a student,	2.402	1.013
10	I have no place for me to complain about the problem.	2.251	1.207

After running the PLS-SEM algorithm, estimated result for the Path Coefficient (β) are obtained and reported for the path model as shown in Figure 1: The diagram reports the results for the inner model obtained through the PLS algorithm and bootstrapping procedure,

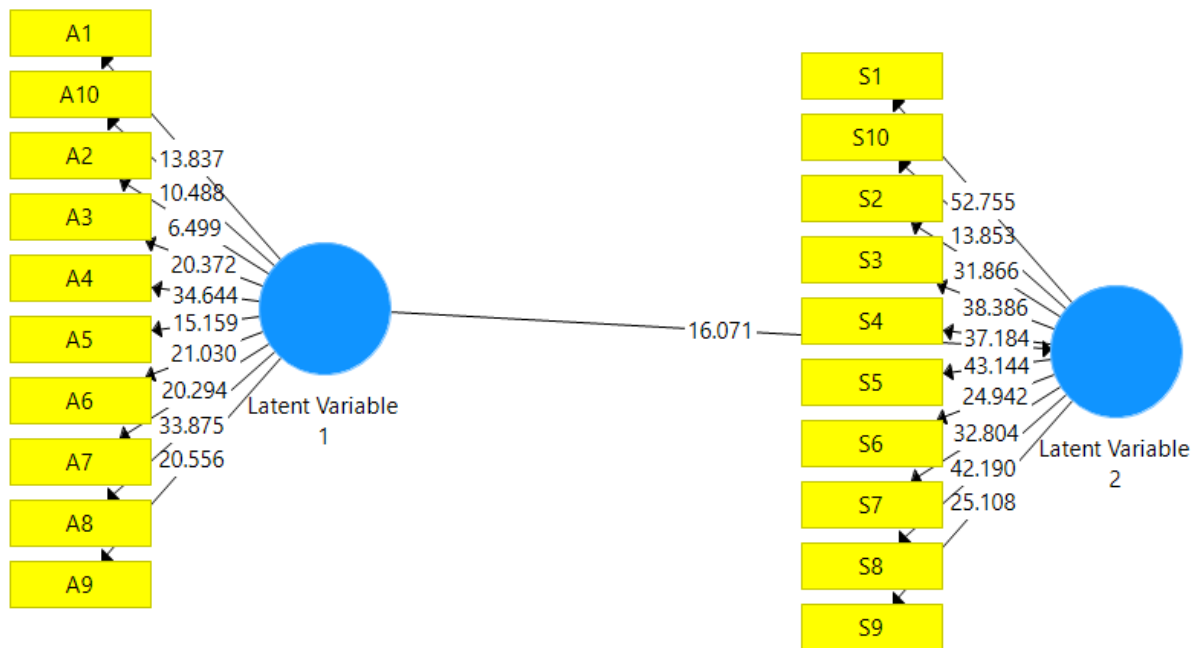


Figure 1: Academic (1) and Stress Relationship (2)

The hypothesised relationship between academic loaded and stress management, was supported (H1). The result indicated a positive significant relationship between academic loaded and stress management with $\beta=0.624$ and $t\text{-value}=16.071$ ($p<0.05$). Table 4 shows the summarized result of the proposed structural model with regards to the path coefficient (β), standard deviation, t-statistics, and p-values.

Table 4: Result of Hypothesis

Hypothesis	Relationship	Path Coefficient (β)	Standard Deviation	t-statistics	p-values.	Result
H1	Academic Loaded and Stress Management	0.624	0.039	16.071	0.000	Supported

5. CONCLUSION

Online academic learning is one of the essential learning skills that students must develop to avoid suffering tension or anxiety while studying. This study's findings indicate that online academic learning and student stress are moderate and unsatisfactory. This suggests that students still lack efficient online academic learning skills and that their stress levels are moderately concerning. These findings directly affect several parties involved in postgraduate studies as online academic learning and stress are skills that can be learned and mastered.

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I-CReST 2022:198-174 - Penggunaan Microsoft Teams sebagai Platform E-Pembelajaran dalam Kursus Pengajian Islam di Jabatan Pengajian Am

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ABSTRAK

Pembelajaran berasaskan teknologi yang diaplikasi masa kini boleh meningkatkan kualiti proses pengajaran dan pembelajaran kerana mengintegrasikan elemen teknologi yang menarik perhatian seperti audio, visual, grafik, animasi dan sebagainya. Oleh itu, kajian ini bertujuan mengenalpasti tahap penggunaan *Microsoft Teams* bagi kursus Pengajian Islam dalam kalangan pelajar semester dua. Tiga konstruk yang diuji ialah tahap pengetahuan, kesediaan dan penerimaan pelajar terhadap penggunaan *Microsoft Teams* sebagai platform e-pembelajaran dalam kursus Pengajian Islam. Rekabentuk kajian yang digunakan adalah berbentuk tinjauan deskriptif dengan menggunakan pendekatan kuantitatif melalui instrumen soal selidik. Nilai kebolehpercayaan *alpha cronbach* 0.983 daripada kajian rintis yang dijalankan terhadap 27 orang pelajar. Soal selidik dikumpul, disemak dan dianalisa dengan menggunakan perisian *Statistical Package of Social Science* (SPSS) 26 dalam bentuk kekerapan, min, peratusan, dan sisihan piawai. Responden terdiri daripada 140 orang pelajar semester dua dari tiga program yang mengambil kursus Pengajian Islam. Secara keseluruhan, dapatan kajian mencatatkan dapatan min dan sisihan piawai bagi konstruk tahap pengetahuan, kesediaan dan penerimaan pelajar adalah tinggi. Kesimpulannya kajian ini mendapati pelajar yang terlibat sangat mengetahui, mahir menggunakan dan menunjukkan kesediaan yang positif dengan penggunaan *Microsoft Team* sebagai platform e-pembelajaran kursus Pengajian Islam. Implikasi kajian menunjukkan penggunaan *Microsoft Team* sangat penting dalam pengajaran dan pembelajaran di politeknik demi menyokong usaha untuk memartabatkan pembelajaran dalam talian di era pandemik ke tahap global sejajar dengan lonjakan kesembilan dalam Pelan Pembangunan Pendidikan Malaysia 2015-2025 (Pendidikan Tinggi)

Kata Kunci: Microsoft Teams; Pengajian Islam; pengetahuan; kesediaan; penerimaan

1. PENGENALAN

Pembelajaran dan pengajaran atas talian adalah sesuatu perkara yang tidak asing lagi semenjak pandemik COVID-19 melanda Malaysia. Pelaksanaan pembelajaran atas talian telah lama dipraktikkan di negara-negara maju kerana ia dipercayai mampu memberikan pelbagai manfaat dan kebaikan.[1] Menurut Taha (2020), laporan UNESCO menunjukkan penutupan sekolah dan universiti telah memberi kesan kepada 1.5 bilion bilangan pelajar di seluruh dunia.[2]. Rentetan daripada itu, kerajaan telah meminta pihak pengurusan sekolah dan IPT untuk

melaksanakan pembelajaran dan pengajaran atas talian. Arahan yang telah dikeluarkan oleh pihak kerajaan itu sekali gus menjadikan sistem pembelajaran dan pengajaran secara maya atau dalam talian sangat penting dan perlu dikuasai sepenuhnya oleh semua pihak yang berkaitan dalam sektor pendidikan di negara ini terutamanya pihak guru, pensyarah serta pelajar. [3]

Setiap IPT mempunyai sistem pengurusan pembelajaran (Learning Management System) yang tersendiri, namun situasi pandemik yang melanda pada hari ini menuntut aplikasi dan teknologi terkini yang lebih menyeluruh untuk menjayakan aktiviti pengajaran dan pembelajaran secara segerak (synchronous) mahupun tidak segerak (asynchronous). [4]. Terdapat beberapa platform digital dalam proses penyampaian ilmu seperti *Microsoft Teams*, Google Classroom, Webex, Zoom serta platform melalui media sosial lain seperti Whatsapp, Telegram dan Youtube. Semua tenaga pengajar diberi ruang untuk menggunakan apa sahaja medium untuk melaksanakan kursus-kursus sedia ada dengan menggunakan kaedah e-pembelajaran (e-learning) melalui platform yang bersesuaian dengan keadaan semasa. Justeru, penggunaan aplikasi *Microsoft Teams* dipilih sebagai platform utama untuk menjalankan sesi pembelajaran dan pengajaran secara segerak disamping platform pembelajaran sedia ada yang disediakan oleh pihak JPPKK.

Microsoft Teams adalah satu aplikasi yang diperkenalkan oleh *Microsoft*. Aplikasi ini diintegrasikan secara langsung dalam *Microsoft Office 360* yang membolehkan seseorang atau institusi yang melanggan untuk berhubung, berkomunikasi, bekerjasama dan melakukan aktiviti dengan mudah dan pantas. *Microsoft Teams* juga membolehkan komuniti berkolaborasi secara *live*, membuat pengumuman (*posts*), memuat naik fail seperti nota (*upload files*), mencatat nota (*setup one note classbook*), memuat naik tugas (*assignments*) dan menyemak tugas pelajar yang dihantar secara dalam talian (*grades*) malah pensyarah dan pelajar juga boleh bertemu secara maya seperti dalam bilik darjah. Fungsi yang ada dalam *Microsoft Teams* ini mampu menarik minat pelajar dalam meneruskan pembelajaran dan pengajaran secara atas talian.

Pelaksanaan pembelajaran dan pengajaran di IPT telah mengalami revolusi daripada kaedah penyampaian dalam bilik darjah atau dewan kuliah kepada pembelajaran dalam talian. Hal ini merupakan satu cabaran yang amat besar bukan sahaja kepada warga pensyarah, malahan kepada pelajar. Mengaplikasikan teknologi seperti mengadakan kelas dalam talian bukanlah mudah, tambahan pula ketika fasa awal pandemik yang secara tiba-tiba memaksa pensyarah dan pelajar untuk 'bersahabat baik' dengan kaedah yang baharu. Tanggungjawab untuk memudahkan proses penghijrahan aktiviti kuliah bersemuka ke atas talian jatuh di atas bahu kedua-dua pihak, iaitu pensyarah dan pelajar. Oleh itu, pelajar perlulah berusaha supaya transisi ini dapat dijalankan dengan jayanya. Kalangan pensyarah pula dinasihatkan supaya memahami kemampuan sesebuah aplikasi teknologi sebelum digunakan sebagai sebahagian daripada solusi teknologi dalam pendidikan. Ini kerana, setiap aplikasi mempunyai fitur dan kemampuan yang berlainan.

Bagi memastikan proses PdP tetap berjalan, pihak Politeknik Sultan Idris Shah (PSIS) dan Politeknik Balik Pulau (PBU) telah mempersiapkan tenaga pengajar dengan memberikan pelbagai latihan penggunaan aplikasi secara komprehensif dan teknikal kepada para pensyarah. Pensyarah dan pelajar juga diberikan beberapa kemudahan bantuan rangkaian internet dan capaian aplikasi secara percuma untuk menjayakan kelas dan tutorial seperti penggunaan *Microsoft Teams*.

Kursus di bawah Jabatan Pengajian Am (JPA) iaitu kursus Pengajian Islam (MPU23032) juga dilaksanakan secara atas talian. Pensyarah telah melaksanakan PdPDT dengan menggunakan platform *Microsoft Teams*. Oleh itu, para pengkaji melihat satu kajian perlu dilaksanakan dalam kalangan pelajar PSIS dan PBU bagi menjawab objektif kajian ini untuk mengenal pasti tahap pengetahuan, tahap kesediaan dan tahap penerimaan pelajar terhadap penggunaan *Microsoft Teams* sebagai platform e-pembelajaran Pengajian Islam.

2. TINJAUAN LITERATUR

Beberapa kajian yang dibuat oleh para penyelidik bagi mengkaji keberkesanan penggunaan *Microsoft Teams* sebagai platform dalam e pembelajaran antaranya kajian hasil dapatan Amani & Umi Hamidaton (2020) mendapati bahawa para pelajar menunjukkan sikap yang positif terhadap penggunaan aplikasi *Microsoft Teams*. Pelajar menunjukkan tahap kesediaan yang tinggi untuk menggunakan aplikasi tersebut pada bila-bila masa yang diperlukan untuk tujuan pembelajaran. Para pelajar juga menunjukkan bahawa mereka sentiasa bersedia untuk mempelajari cara-cara menggunakan *Microsoft Teams* dengan lebih berkesan dan mereka tidak bersetuju bahawa penggunaan *Microsoft Teams* menghalang mereka daripada berinteraksi secara aktif dengan pensyarah semasa kuliah dijalankan. [5]

Kajian ini disokong oleh hasil dapatan Adi Suarman dalam kajiannya yang bertajuk *Microsoft Teams For Education Sebagai Media Pembelajaran Interaktif Meningkatkan Minat Belajar* menunjukkan bahawa pembelajaran menggunakan *Microsoft Teams* sebagai platform dalam pembelajaran adalah sangat baik digunakan untuk meningkatkan minat belajar.[6] Ini juga bertepatan dengan kajian Muh. Rais & Herdiawal (2021) di mana hasil kajian mereka mendapati sebanyak 94% pelajar bersetuju dengan penggunaan *Microsoft Teams* dalam bidang matematik Institut Agama Islam Muhammadiyah.[6]

Adapun ditinjau daripada sudut kesediaan pelajar mendapati hasil kajian Abdul Aziz Ishak & Aida Zuraina Mir Ahmad Talaat (2020) berkaitan kesediaan pelajar untuk menghadapi pembelajaran secara atas talian pula mendapati bahawa tahap kesediaan pelajar berada pada tahap sederhana dengan nilai min keseluruhan 3.14.[7] Menurut Mohd Zulfakar Bin Mohd Naw, Abdul Majeed Bin Zulkipli & Abdul Rasid Bin Abdul Razzaq (2022) mendapati bahawa pelajar kursus Pendek di Kolej Komuniti Rompin bersedia untuk melaksanakan pembelajaran secara atas talian.[8]. Namun begitu terdapat halangan yang perlu diatasi seperti situasi atau persekitaran pelajar sama ada dalam melaksanakan sesuatu atau persekitaran mereka termasuklah kesibukan dengan kerja, pengurusan masa kurang cekap dan gangguan daripada kerja lain (Schilke, 2001). Manakala halangan personaliti pula merujuk kepada persepsi kewujudan halangan disebabkan diri sendiri dan sikap terhadap e-pembelajaran.

Bagi mengenalpasti tahap penerimaan pelajar terdapat beberapa kajian antaranya hasil kajian Noorazian Mohd Arshad, Zulkurnain et.al (2021) mendapati bahawa daripada sudut tanggapan mudah guna pelajar bersetuju yang e-pembelajaran menjimatkan masa membuat rujukan, mereka selesa menggunakan sistem ini kerana ia mudah dan e-pembelajaran dapat menyediakan maklumat yang tepat, baik, terperinci dan tepat pada masa yang diperlukan. Daripada ciri-ciri pensyarah, menunjukkan pensyarah berpengaruh terhadap penerimaan e-pembelajaran dalam kalangan responden selain kualiti daripada sudut teknikal [9]

Oleh itu, kajian ini akan memfokuskan kepada tahap pengetahuan, kesediaan pelajar sebagai indikator utama untuk melihat sejauh mana penerimaan mereka terhadap penggunaan platform pengajaran dan pembelajaran atas talian khususnya *Microsoft Teams* dalam Pengajian Islam.

3. METHODOLOGI

Reka bentuk kajian yang digunakan dalam kajian ini adalah berbentuk tinjauan deskriptif dengan menggunakan pendekatan kuantitatif melalui instrumen soal selidik yang melibatkan 140 orang sebagai sampel. Responden kajian yang terdiri daripada 39 orang pelajar lelaki dan 101 orang pelajar perempuan ini dipilih melalui teknik persampelan rawak mudah dari dua buah Politeknik iaitu Politeknik Sultan Idris Shah dan Politeknik Balik Pulau. Soal selidik yang digunakan dan konstruk kajian telah disemak oleh pakar penilai. Nilai *Cronbach Alpha* iaitu 0.983 telah menunjukkan bahawa instrumen tersebut mencatatkan nilai kebolehpercayaan yang baik dan boleh diterima dalam kajian ini (Azizi, 2006) [10]. Sementara itu, kajian tinjauan sesuai dijalankan untuk mengukur pendapat dan persepsi (Kariya et al. 2020) [11]. Teknik yang dipilih untuk melakukan kajian tinjauan adalah dengan menggunakan soal selidik. Ini adalah kerana soal selidik adalah cara yang praktikal dan paling berkesan untuk mendapatkan maklumat (Najmul Hasan & Bao Yukun, 2020) [12]. Data kajian ini dianalisis secara statistik deskriptif untuk menentukan tahap min dan sisihan piawai menggunakan perisian SPSS versi 26. Interpretasi semua pembolehubah dalam kajian ini ditentukan melalui interpretasi tahap yang diberikan oleh Jamil Ahmad (2002) seperti ditunjukkan pada Jadual 1. [13]

Jadual 1: Interpretasi Min dan Tahap

SKOR MIN	TAHAP
3.67 – 5.00	Tinggi
2.34 – 3.66	Sederhana
1.00 – 2.33	Rendah

4. DAPATAN KAJIAN

4.1 Tahap Pengetahuan Pelajar Terhadap Penggunaan Microsoft Teams sebagai platform e-Pembelajaran Pengajian Islam

Berdasarkan Jadual 2, tahap pengetahuan pelajar terhadap penggunaan *Microsoft Teams* ($M=4.20$, $SD=0.76$) berada pada tahap tinggi. Justeru, dapat dirumuskan bahawa tahap kesediaan pelajar terhadap penggunaan aplikasi Microsoft teams sebagai platform e-pembelajaran kursus Pengajian Islam menunjukkan tahap tinggi.

Jadual 2: Pengetahuan Pelajar Terhadap Penggunaan Microsoft Teams sebagai platform e-Pembelajaran Pengajian Islam

Konstruk	N	Min (M)	Sisihan Piawai (SD)	Tahap
Pengetahuan	140	4.20	0.76	Tinggi

4.2 Tahap Kesiediaan Pelajar Terhadap Penggunaan Microsoft Teams sebagai platform e-Pembelajaran Pengajian Islam

Berdasarkan Jadual 3, tahap kesiediaan pelajar terhadap penggunaan *Microsoft Teams* ($M=3.85$, $SD=0.66$) berada pada tahap tinggi. Justeru, dapat dirumuskan bahawa tahap kesiediaan pelajar terhadap penggunaan aplikasi *Microsoft Teams* sebagai platform e-pembelajaran kursus Pengajian Islam menunjukkan tahap tinggi.

Jadual 3: Kesiediaan Pelajar Terhadap Penggunaan Microsoft Teams sebagai platform e-Pembelajaran Pengajian Islam

Konstruk	<i>N</i>	Min (<i>M</i>)	Sisihan Piawai (<i>SD</i>)	Tahap
Kesiediaan	140	3.85	0.66	Tinggi

4.3 Tahap Penerimaan Pelajar Terhadap Penggunaan Microsoft Teams sebagai platform e-Pembelajaran Pengajian Islam

Berdasarkan Jadual 4, tahap penerimaan pelajar terhadap penggunaan *Microsoft Teams* ($M=4.38$, $SD=0.75$) berada pada tahap tinggi. Justeru, dapat dirumuskan bahawa tahap penerimaan pelajar terhadap penggunaan aplikasi *Microsoft Teams* sebagai platform e-pembelajaran kursus Pengajian Islam berada pada tahap tinggi dalam kajian ini.

Jadual 4: Penerimaan Pelajar Terhadap Penggunaan Microsoft Teams sebagai platform e-Pembelajaran Pengajian Islam

Konstruk	<i>N</i>	Min (<i>M</i>)	Sisihan Piawai (<i>SD</i>)	Tahap
Penerimaan	140	4.38	0.75	Tinggi

5. PERBINCANGAN

Setelah data kajian direkod dan dianalisis, hasil kajian mendapati pelajar yang terlibat sangat mengetahui, mahir menggunakan dan menunjukkan kesiediaan yang positif dengan penggunaan *Microsoft Teams* sebagai platform e-pembelajaran kursus Pengajian Islam. Kesemua pembolehubah menunjukkan tahap yang tinggi terhadap penggunaan *Microsoft Teams*. Dapatan ini disokong oleh kajian yang dijalankan oleh kajian Siti Fatimah dan Siti Hasmiza (2018) yang mana pelajar memberikan respon yang sangat positif terhadap penggunaan e-learning dari aspek tahap pengetahuan, sikap dan tahap motivasi. [14] Berdasarkan kajian, pelajar bersetuju bahawa mereka mempunyai kemahiran menggunakan *Microsoft Teams*, mereka mengetahui bahawa *Microsoft Teams* banyak kelebihan dan digunakan untuk pembelajaran semasa PKP. Walaubagaimanapun, dapatan kajian ini bertentangan dengan Siti Syahida (2020) yang berpendapat bahawa 60 orang pelajar Sijil Pengoperasian Perniagaan yang menggunakan *Microsoft Teams* mencatatkan tahap interaksi dan pengaruh persekitaran menggunakan *Microsoft Teams* adalah sederhana kerana platform dalam talian ini masih baru untuk mereka sesuaikan dalam pembelajaran. [15]

Selain itu, dari segi kesediaan, data merekodkan para pelajar bersedia menggunakan *Microsoft Teams* pada bila-bila masa untuk tujuan pembelajaran, bersedia menggunakan tanpa bantuan pensyarah, bersedia menyiapkan pelbagai aktiviti latihan dalam *Microsoft Teams* dan bersedia mengubah cara pembelajaran kepada kaedah *Microsoft Teams*. Dapatan ini selari dengan kajian oleh Diyana, Hasmah & Isma (2020) yang melibatkan 46 orang pelajar semester 3 dari Jabatan Kejuruteraan Elektrik, Politeknik Merlimau yang mengambil kursus 'Communications System Fundamentals menyatakan bahawa nilai peratusan dan kekerapan keseluruhan platform e-pembelajaran menggunakan aplikasi '*Microsoft Teams*' adalah tinggi. 16]

Sehubungan dengan itu juga, dari analisa data bahawa pelajar menunjukkan penerimaan yang tinggi bahawa *Microsoft Teams* memudahkan proses pembelajaran kerana platform mesra pengguna. Di samping itu, pelajar bersetuju menerima bahawa *Microsoft Teams* membantu pelaksanaan penilaian kursus, membantu menguasai topik berkaitan Pengajian Islam dan membantu meningkatkan prestasi dalam kursus Pendidikan Islam. Berdasarkan dapatan kajian Nor Salmawati, Norhana & Nor Suhaila (2020), 183 orang responden dari Jabatan Perdagangan, Politeknik Port Dickson menyatakan bahawa tahap kesedaran pelajar terhadap e-pembelajaran pada tahap yang baik (skor min 4.16) dan juga tahap penerimaan pelajar terhadap e-pembelajaran (skor min 4.06)[17]

6. KESIMPULAN

Kesimpulannya, dapatan kajian ini mencatatkan bahawa tahap pengetahuan, kesediaan dan penerimaan terhadap aplikasi *Microsoft Teams* sebagai platform e-pembelajaran dalam kursus Pengajian Islam berada pada tahap tinggi. Sehubungan dengan itu, platform ini wajar diteruskan dan dipraktikkan oleh pelajar dan pensyarah Pendidikan Islam dalam kursus-kursus lain lagi. Penjimatan kos dengan mengurangkan penggunaan kertas dapat dibuktikan dengan penggunaan platform *Microsofts Teams*. Semua tugas dan penilaian yang diberikan kepada pelajar dimuat naik ke dalam *channel* yang telah disediakan di dalam aplikasi ini. Penggunaan *Microsoft Teams* juga dapat memudahkan pelajar untuk mengakses semua nota mengikut keperluan mereka tidak mengira masa. Hasil kajian ini dapat memberi implikasi kepada pihak pengurusan, para pensyarah dan para pelajar. Usaha yang jitu diperlukan dalam kalangan pelajar dan pensyarah untuk menggabungkan penggunaan *Microsoft Teams* dengan lebih meluas demi memaknakan pembelajaran kursus Pengajian serta memanfaatkan pembelajaran dalam talian tahap global selari dengan lonjakan kesembilan dalam Pelan Pembangunan Pendidikan Malaysia 2015-2025 (Pendidikan Tinggi).

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I-CReST 2022:200-212 - Rights of Children to Education in the United States of America and Malaysia; A Brief Review of Issues in Delivering the Rights

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ABSTRACT

This paper reviews the children's rights to education in Malaysia and the United States of America. It will also examine some issues in carrying out those rights. Legislations of the respective states will be examined as well as the relevant provisions in the United Nations Conventions. Doctrinal methodology will be employed throughout the paper. Observation concluded that different countries have different sets of problems unique to its people. Ultimately, overcoming the issues are challenges that each country must formulate by itself. The results may vary from one country to another.

Keywords: Children's rights to education; unique problems; peculiar solutions; doctrinal methodology

1. INTRODUCTION

One of the rights guaranteed to all children under the United Nations Convention on the Rights of the Child (UNCRC) is the right to education. According to UNICEF, it entails the right of a child to be able to learn the basic knowledge and skills they require to thrive. However, a world where all children are universally given the right to education is at this moment in time, a utopian idea. Different countries have different ways of fulfilling the rights of a child to education, if any, and they also face numerous challenges. The question this paper aims to answer is how the state of a child's right to education is in the United States of America and Malaysia, and what are the current problems faced in implementing such a right in each country. To accomplish this, the paper reviews legislation from the two countries as well as related articles from prominent sources in the Human Rights community.

1.1 Definition

Before delving into the matter of comparing the two State's implementation of a Child's Right to Education, we must first define the terms involved. Firstly, education can be defined as all types and levels of education, including access to education, the standard and quality of education, and the conditions it is provided through, according to Article 1(2) of the Convention Against Discrimination in Education 1960 by UNESCO[5]. A child, on the other hand, is defined by the Convention on the Rights of the Child as every human being below the age of majority of a country, commonly 18 years old.[6]. The right of a child to education is derived from Article 26 of the Universal Declaration of Human Rights, which lays down that

every individual has the right to education which can provide the fundamental knowledge an individual requires in life[23]. This is further reinforced by Article 13(2) of the International Covenant on Economic, Social and Cultural Rights, which states that each child should at least have the right to full primary or fundamental education[15].

1.2 The State of a Child's Right to Education

This section aims at identifying the current state of a child's right to education in two countries, being; the United States of America, and Malaysia. For our study, we have researched the historical backgrounds of the right to education in each country, as well as any existing legislations or implementations regarding said right of children.

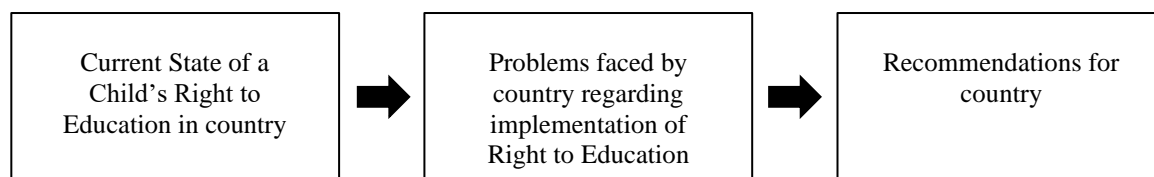


Figure 1: Conceptual Framework

1.3 The United States of America

A child's right to education in the United States of America is rather complicated. Education is not a constitutionally protected right for Americans in the United States of America. In fact, the only mention of education in the United States Constitution is under the 10th Amendment [26]. The 10th Amendment, details that the matters not explicitly mentioned in the Federal Constitution of the United States, such as education, are left within the jurisdiction of the state governments. What this means is that Federal Acts may promote education and make them compulsory to certain extents, but ultimately the actual implementation of education is left to each state (Dorsey, 2020) [7]. As a result of the 10th Amendment, only twenty-two of the 50 American States explicitly recognize the rights of a child to education, implying that any action to demand a child access to education in the remaining twenty-eight states would result in failure (Access to Education, n.d.) [1]. Fortunately, however, from an observation of the Department of Education of the United States of America, at least five years of education is required for children in each state, though the form of education required is vague and left unspecified (US Department of Education, n.d.)[27]. Furthermore, all children in the United States have free access to public education, should they choose to attend, including undocumented children. This was solidified by the decision of the Supreme Court in *Plyler v Doe* [1982], where the court ruled that any child, regardless of whether they are a national or have proper documentation, have the right to free public schooling (ACLU, n.d.)[2].

From an international perspective, the United States of America is still one of the three countries in the world (alongside South Sudan and Somalia) to not have ratified the United Nations Convention on the Rights of the Child (UNCRC) to this day. The country remains a mere signatory to the convention ever since the country signed the convention in 1995 (United Nations Treaty Collection, n.d.)[21]. This is in spite of the fact that the UNCRC itself was drafted by Americans under the support of the government (Gainborough & Lean, 2008)[14]. Opposition to the ratification of the UNCRC are of the opinion that the ratification of the treaty

would be allowing foreign powers (being the United Nations) to interfere in matters of the State, specifically on matters within the jurisdiction of the states (Fagan, 2001) and Reid v Covert (1957)[12, 19]. Not to mention, this view had further been solidified through the case of Pierce v Society of Sisters [1925] where the Supreme Court ruled that no government (whether local or foreign) can interfere with the rights of control a parent has over their child[18]. This decision meant that a parent has the right to choose however they wish to raise their children. Regardless, the US Constitution has not prevented the Federal Government and the Judiciary from performing initiatives to promote education among children as seen in Table 1.

Table 1: Legislation Pushing Education in the United States of America [27]

Federal Legislation / Case-law	Purpose / Result
Every Student Succeeds Act 2015	Requires that public schools impart education of a high-quality to children which would allow all children to be able to go to college.
Elementary and Secondary Education Act 1965	Provides federal funding for school-going children, especially those from lower-income families and communities.
Equal Education Opportunities Act 1974	No form of discrimination should be practiced in the field of education.
Title IX Education Amendments Act 1972	Prohibits any form of discrimination in public education in the country.
Brown v Board of Education [1954]	Struck down that segregation in American Public Schools was unconstitutional to the US Constitution.

1.4 Malaysia

The matter of a child's right to education in Malaysia is relatively straightforward. This mainly derives from the fact that education is placed under the jurisdiction of Malaysia's Federal Government, as provided for in Article 74 of the Federal Constitution of Malaysia (and the First List of the Ninth Schedule) [13]. The placement of education under Federal jurisdiction allows for a more streamlined education system throughout all thirteen states and each of the Federal Territories. The Federal Constitution also provides for equal rights of admission for all children to public schools without discrimination based on religion, race, descent, or place of birth. Furthermore, Malaysia ratified the UNCRC in 1995, and the result can be seen in amendments to existing laws and the creation of new laws. To illustrate, section 29A(4) of the Education Act 1966 makes it compulsory for all children to receive and attend primary school education for 6 years. Parents who refuse to send their primary-going children to school for a 6-year period without valid reason are also set to be fined an amount not exceeding RM5000 or face a maximum penalty of a 6-month prison sentence[8].

2. CHALLENGES REGARDING THE RIGHTS TO EDUCATION

This section of the paper will examine the different challenges faced by the two countries studied; the United States of America and Malaysia, regarding the rights of children to education.

2.1 The United States of America

The main challenge when it comes to a child's right to education in the United States of America is that, as previously mentioned, the country has no legal obligation whatsoever to grant said right to education to children. It is one of three states in the world not to ratify the convention, other than Somalia and South Sudan. Many critics and advocates for education such as the American Civil Liberties Union (ACLU) urge the State and Federal Governments to ratify the convention as education is vital to a state. However, according to the Supreme Court of the United States in the case of *San Antonio Independent School District v Rodriguez* [1973], the importance of a particular right or service does not determine whether said right or service is fundamental enough to be protected by the US Constitution as it is now [20]. Subsequently, a problem that arises from this is the fact that there is no mention of education anywhere in the US Constitution, and the 10th Amendment of said constitution only leaves the matter of education up to the jurisdiction of each state [26]. As such, while the US federal government may make pushes for education among all its citizens, the matter of education and consequently, a child's rights to education will forever remain under the jurisdiction of state governments, unless the US constitution is amended by the legislature, which is yet to be seen.

This also means that matters such as the creation of new schools, funding of public schools, as well as the syllabus of education are under the exclusive jurisdiction of the state governments. As a result, this poses a problem for states where their state government has more interests in other aspects such as Border Patrol, the police and etcetera as compared to education. A lack of funding to the education sector means that most children will not have access to proper quality education, resulting in mass dropouts as seen in the state of New Mexico (Baker, 2019) [3].

2.2 Malaysia

Despite government and public efforts, there are still children who are unable to attend a school or benefit completely from our educational institutions. First and foremost, lack of documentation, where children without birth certificates or proper documentation are unable to benefit from access to any form of public education, as they aren't allowed to enrol without the right papers. Most refugees and asylum-seeking children do not have proper documentation with them in their new countries. Children of foreigners that do have proper documentation have to pay to enter public schools, priced at the unsubsidized rate. Article 2, 22 and 28 of CRC urge State Parties to allow access to formal education to all refugee and asylum-seeking children, which has yet to be achieved by Malaysia [6].

Secondly, children with disabilities, where children with mental and behavioural disabilities are more likely to be out of school compared to children with physical disabilities as national schools are not equipped to be inclusive. Nowadays, there are several challenges faced in Malaysia's special needs education sector. From the interview and the focus group discussion, six main themes emerged (Nasir & Efendi, 2016) [17]. Those themes are facilities,

readiness, resources, lack of provision of appropriate teaching materials, early intervention programs, and equitable accredited examinations for students with learning disabilities (Nasir & Efendi, 2016)[17].

Last but not least, many indigenous children are not able to go to school because either the schools are located too far from where they are, or they do not have the documentation, or they cannot afford the expense of sending a child to school. In addition, language barriers hinder their progress in national schools (UNICEF, 2019)[24].

3. CONCLUSION AND RECOMMENDATIONS

To conclude, both countries used in this study have all noted the importance of a child's right to education, and subsequently enforced legislation related to it with varying degrees of implementation. However, challenges are bound to arise, as even the 'greatest' country in this aspect has certain problems related to this issue. Regardless, this should not deter countries from aiming to supplement and address any issues that are currently present for the sake of our children, who will be the leaders of the future. In the case of Malaysia, we recommend that the Malaysian Government be more proactive in managing refugees via communication and negotiation with the United Nations Refugee Agency to ensure that any refugees or those without proper documentation in general are given a chance to receive education in some form. The Government should also aim to reduce the stigma surrounding physical and mental challenges to facilitate a more conducive environment for gifted individuals. For the United States of America, it must be recommended that the US Government properly ratifies the Convention on the Rights of the Child which has been long overdue. An amendment to the Tenth Amendment of the US Constitution would also be beneficial in ensuring that the American education system becomes more streamlined and orderly.

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Lastly, we could not have undertaken this journey without the motivation and support from our parents during the process.

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I-CReST 2022:203-177 - Acceptance and Readiness in Augmented Reality Use among Lecturers in Classroom

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ABSTRACT

Technology contributes a lot of advantages in teaching and learning. In fact, in this recent COVID-19 pandemic situation, most teaching and learning are conducted online. Therefore, lecturers need to prepare themselves and adapt to the changes and technological progress in line with the government initiatives in digitalising the education system. Continuous online classes can be dull for the students hence lecturers need to find ways to make the classes interesting and engaging. One way in creating engaging and interesting classroom is by applying augmented reality (AR). This paper is looking at the acceptance and readiness among the lecturers in adopting augmented reality in classroom and factors that are affecting their acceptance and readiness. Interviews were conducted with five (5) lecturers from various teaching background in a local university to understand their acceptance and readiness in applying augmented reality (AR) in their classroom and factors affecting them. The findings revealed that all respondents accepted AR but majority of them are not fully ready to adopt the technology in their classrooms due to various reasons. Thus, before the integration of AR in the classrooms, it is important for the lecturers to be exposed to AR in order to increase their level of readiness to adopt AR in their teaching.

Keywords: Augmented reality; lecturers' readiness; lecturers' acceptance; teaching and learning; technology in education

1. INTRODUCTION

In general, the teaching and learning in this 21st century is still being conducted through traditional methods [1]. However, traditional teaching methods are seemed to be obsolete in this current era especially after the recent COVID-19 pandemic situation where education is conducted online. Thus, the teaching needs to continue growing and equipped with the use of technology [2].

Previous studies have proven that the use of technology in education has a lot of advantages for both educators and learners. [3] One of the advantages of technology in education is it can "promote critical thinking and improve the learning process." Since the current situation where learning is conducted online, the use of technology is crucial in order to ease the learning process. Hence, educators need to be aware of the importance technology in the classroom and how it contributes to the improvement of the learning so that they can be passionate about this vision and put it into practice [4].

However, so much that educators act as the tool in ensuring the success of using technology in a classroom, it is irrefutably that some educators have continuously faced new challenges in delivering their lesson as the platform of teaching and learning evolved overtime depending on the situation. The method of delivery should not practice similar approaches in catering the learners' need. Therefore, the educators' willingness to change and adapt to the new learning environment is needed to ensure that the lesson prepared are on par with the latest educational goals. With everyone has an access to mobile phones and other technological devices, the use of Augmented Reality (AR) technology seems to be a new approach in education. For example, in language classroom, the use of AR is important to ensure that the language learning is more interactive and engaging.

According to [5], AR is an 'interactive, immersive and engaging' (p. 729) and they emphasised that the integration of AR could increase the focus of students and their motivation to learn. In fact, [6] believed that AR as "one of multiple media integrated learning application that offers a new bright light into the learning process." AR not only motivate the learners but also educators as it encourages educators to prepare a rich teaching and learning environment since information and knowledge is represent in a new, interesting and innovative way.

Despite of there are numerous numbers of advantages when using AR in education based on previous studies and that educators are considered as one of the crucial factors in ensuring the success of the AR integration into the classroom [7], it is also vital to conduct more research to see educators' readiness of using this new technology [6] and also to study the AR experience among teachers [8].

Therefore, the objectives of this current study are to discover the lecturers' acceptance and readiness regarding the integration of augmented reality (AR) in classrooms and factors affecting them in order to fulfil the gap and to further understand the educators' specifically lecturers about their views regarding AR.

2. LITERATURE REVIEW

Since the growth of AR in the teaching and learning, the use of this technology can be seen in the classroom or even outside of the classroom [9]. One of the factors that can contribute to the success of this integration is indeed educators. Previous studies have been conducted to examine the educators' acceptance and readiness of AR and technology from different educational level but mainly among primary and secondary school educators to determine the success of incorporating AR technology in education.

2.1 Educators' Acceptance in Using Augmented Reality (AR)

Despite of the AR brings advantages in teaching and learning in the 21st century learning, however [5] stated that the level of acceptance of AR in educational context is still relatively low. This is also agreed by [10] that even though the teachers in Cyprus and Greece stated that they were familiar with AR and comfortable with the idea of using AR in the classroom but it does not match the reality in their classroom.

A lot of factors that contribute to the acceptance of AR among educators. Previous studies identified some specific factors that may affect the acceptance of AR technology in education which are; "curriculum, stability of the interaction, self-learning capability, parents'

involvement, students' background, platform, and social factors" [11, 12 & 13]. Another factor that might influence the acceptance of AR among educators is the complex process of AR applications development. The development of an AR is time- the development of an AR experience is time-consuming [14 & 15] and thus it requires more than one person to implement it [16] since AR is highly challenging for those who are not familiar with its application.

2.2 Educators' Readiness to Use Augmented Reality (AR)

Educators' degree of readiness to use AR in classrooms is varied as it is due to various factors. In a study conducted by [6], the finding revealed that the teachers' readiness to use AR in their classrooms is mainly depending on the exposure received about the technology itself. [6] further added that when "teachers have the opportunity to explore different approaches on the basis of technologies" and with proper guidance, their degree of readiness is also changes from low to high in using AR in classrooms.

Similar finding from a study conducted by [1] regarding teachers' readiness of integrating augmented reality (AR) in education that "teachers show a minimum to moderate level of expertise skilled in handling different ICT aspects and show less familiarity with AR technology" as they have lack of exposure to AR. Since teaching method is associated with educators' preference in teaching, therefore, in order to ensure that educators are ready to integrate AR, enough exposure and experience are crucial.

Thus, from previous studies regarding educators' acceptance and readiness of the integration of AR in a classroom, the level for both is relatively low even though AR gives a lot of advantages in the 21st century teaching and learning. AR is indeed enabled learners to experience an interesting way to learn a subject and to strengthen their understanding on topics and thus educators need to have more exposure and help in using AR in classroom in order to ensure the success of using AR in teaching and learning.

3. METHODOLOGY

In this study, participants were selected based on purposeful random sampling in order to cater participants from a local university who are teaching foundation students. Five (5) educators from various teaching background were selected to provide their views on the AR technology in classroom. In this current study, lecturers were interviewed individually in order to give them more time and the ability to freely express their opinions.

A semi-structured interview questions was used as the main instrument in the study. Three (3) open-ended interview questions were used to gauge educators' perceptions about the integration of AR technology in class. Th questions asked were;

1. Have you heard about Augmented Reality (AR)? How?
2. Do you accept the integration of Augmented Reality (AR) in your classroom? Why or why not?
3. Are you ready to integrate Augmented Reality (AR) in your classroom? Why or why not?

Following the inductive process, data were analysed manually in order to answer all the research questions. Such method enables findings to be obtained and while analysing the data,

all transcripts were reviewed repetitively to identify the potential meanings of the raw data. Later, relevant themes were developed.

4. FINDINGS & DISCUSSION

4.1 Awareness about Augmented Reality (AR)

All of the five (5) respondents are aware of AR technology since they have read about. Two (2) respondents, *Respondent A* and *B* mentioned that AR is related to their teaching and learning background.

"I know about AR since I am teaching about the current trend in IT to my students"-
Respondent A

Whereby for *Respondent B*, it is more to related the field that she is studying for her postgraduate studies.

"I have read about AR while I am browsing for information related to my PhD studies. I am doing a study about gamification in classroom and I found one article about a game that use this AR technology"- **Respondent B**

4.2 Factors that Lead to Educator's Acceptance of Augmented Reality (AR)

4.2.1 Enhance Learning Experience

In terms of accepting AR, *Respondent A* and *Respondent C* completely accept the use of this technology in teaching as it is interactive and thus can enhance students' learning experience.

"Yes, I accept the use of this technology as I feel that... I used it once, and I find it interactive and I know it will enhance students' experience in learning the subject". - **Respondent A**

"I accept the use of AR in the classroom since it will be interesting for the students to have different learning experience as the concept of AR is unique". - **Respondent C**

AR is indeed an interactive technology and as supported by [13], previous studies have shown that AR helps to improve teaching and learning practice in educational sector since the technology allows students to explore the learning in-depth rather than just on the surface.

4.2.2 Teaching and Learning Demand

Respondent B also accept the use of AR as it to keep up with the latest trend in teaching and learning.

"Yes, I accept the use of AR in teaching and learning because I know that it is crucial to keep up with the current trend in teaching and learning to make my lessons interesting for my students" - **Respondent B**

It is undeniably that augmented learning is considered as an on-demand learning technique in this 21st century learning since it adapts to the needs of the learners [17]. Both responses

given by *Respondent A* and *Respondent B* are contradict with the finding from previous studies stated in chapter 2 where the level of acceptance among educators are still considered low.

4.3 Factors that Lead to Educators' Readiness to Use Augmented Reality (AR)

4.3.1 Easy to Use

Respondent A is positive and willing to integrate AR in her teaching session as according to her the technology itself is easy to be used although to some it might be too technical.

"I am so ready to use AR in my class because... because I am teaching technology to my students. And although it looks complicated but actually AR is easy to use... but it is technical but if you know how to use, it is actually easy". – Respondent A

Respondent A's readiness to use AR might be due to the fact that she has background knowledge of AR since she is teaching technology. In a study conducted by [18] on factors that influence teachers' intention to use technologies revealed that, teachers that have "basic knowledge about AR are highly aware of the usefulness and ease of AR use in teaching and learning".

A study conducted by [19] revealed that, when teachers perceive ease of use (PEU) is high, it does influence their attitude in using AR. This is what *Respondent A* feels towards AR as she believed that AR is easy to use although it looks complicated.

4.3.2 Increase Students' Motivation to Learn

As for *Respondent B*, she is willing to use AR technology in her lesson as she believes that it can help to boost their motivation to learn.

"Yes, I am so ready to use AR in my teaching as I strongly believed that with is interactive features, students are more motivated to learn in class" – Respondent B

One of the aspects of AR is it allows students to observe an object from different points of view and because of this aspect, students has shown positive attitudes towards AR and increases this their motivation towards learning [20]. Therefore, considering that AR has proven that it helps to boost students' motivation in learning, *Respondent B* is positive about using AR in her classroom.

4.3.3 Time Consuming

However, *Respondent D* is not ready to implement is his teaching as he believed that AR is time consuming and there are many chapters need to be cover before the end of the semester.

"I am not ready to use AR in my classroom as I think it requires a lot of time to set up... and... Oh, I need to cover a lot of topics before the semester ends. So, it is a no for me." – Respondent D.

Based on the finding from a study conducted by [21] among In-service English Teachers' Perceptions Towards the Use of Augmented Reality (AR) in ESL Classroom, lack of training

in “operating technological devices” that contributed to their negative perceptions towards the ease of use of a technology. This is also supported by [22] that educators are not keen to use technology in classrooms possibly due to lack of technical support available as well as time constraint in classroom [23&24]

4.3.4 Poor Internet Connection

Even Respondent E is not ready to use AR in her classroom because of the internet connection

“I am not ready to use AR in my classroom as the internet connection is unstable. It might interfere with my lessons.” – Respondent E

Respondent E concerned about the integration of AR is supported by [16] that “the current AR systems are likely to experience operational problems such as system failures, tracking errors, or hardware challenges, which might affect user acceptance.” Hence, network speed is also important aspect that will determine educators’ readiness to use AR.

5. CONCLUSION

Technology is currently an attachment to the lesson that the instructors must incorporate. In ensuring the sustainability of the program and to make it relevance to the digital natives, the lecturers need to change the style of teaching and delivery. With the use of AR, the lecturers can make the lesson more engaging and fun. The integration of AR in the teaching and learning can be successfully done if proper guidelines are given to the instructors and making sure that it is aligned with the syllabus prepared. The finding emphasised that the lecturers are able to accept the integration of AR as it is engaging and would likely to increase students’ motivation in learning, but they are not ready to fully incorporate it in their lesson. This is due to challenges such as time consuming, the ‘technicalities’ of AR and poor internet connection.

However, due to the demand, they are willing to explore. Curriculum developers can reflect from findings given although it does not represent the majority. The sampling of this qualitative study is based on a small scale as to emphasise the objectives of this study which to seek for readiness and acceptance among the lecturers in integrating AR in their lesson. It will also be helpful to have a questionnaire to better understand the educators’ level of acceptance and readiness on to of using the interview method. Therefore, the perception of these instructors can be further explored as it will influence how the system should be changed if needed.

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I-CReST 2022:205-195 - Legal Implications of Online Harrasment in Malaysia

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ABSTRACT

The use of social media as a communication channel has exploded. It is now considered a need rather than a luxury. Anyone with Internet access anywhere in the globe has ability to speak with and attract a vast global audience. While the internet has numerous advantages, such widespread communication can also be utilised for harmful reason such as online harassment. Online harassment such as posting rumours, threats, sexual remarks, cyber stalking, trolling, flaming, distributing negative and inaccurate content may cause significant and negative consequences in a person's life, including death. Therefore, this paper will illustrate the legal implications of online harassment. This study adopts a doctrinal legal research methodology to examine the Malaysian law and regulations regarding this issue. Apart from that, this paper will also highlight several cases within this context. At the end, finding indicates that people must be aware and alert to protect themselves from being victim of online harassment and legal authorities must play their role in combatting this issue.

Keywords: Online harassment; communication; legislations; victim

1. INTRODUCTION

The rapid technology advancements over the last few decades have resulted in a slew of troubling online occurrences. Online harassment refers to a broad range of aggressive online behaviours, such as cyberbullying, that are marked by frequent attacks that significantly diminish victims' feelings of enjoyment and wellbeing. Some people use the internet and social media platforms as a new way of harassing, insinuating negativity to harm other users emotionally and psychologically.

Cyberbullying and trolling are one example of online harassment. Cyberbullying can be defined as aggression that is intentionally and repeatedly carried out in an electronic context against someone who cannot easily defend themselves. Whereas trolling is the result of indiscriminate targeting, involving any subject matter. A study in United Kingdom (UK) discovered that online harassment offences in the UK has risen considerably between 2014 and 2015. Academic studies report varying rates of cyberstalking, ranging from 9% to 46.7% in which Most victims of cyberstalking are female, and most perpetrators are male(Davidson, J. *et all*, 2019)[1]. Online harassment usually takes place in public places like chat rooms or discussion forums in the form of abusive, insulting, or unwanted messages, or sending hurtful messages to someone online via private communication channels such as email, instant messaging, or SMS. The act of misuse technology such as posting rumours, threats, sexual

remarks, flaming, distributing negative and inaccurate content, and denigration are other examples of harmful online harassment behaviour.

In 2013, Malaysian Institute for Youth Development Research reported that 389 incidents of internet harassment were suspected to have happened, with 62.3 percent of adolescents being victimised and the remaining 37.7% having never been targets. Malays had the highest percentage of young people in Malaysia who have been harassed online, at 67.5 percent, followed by Sarawakians at 63.6 percent, Indians at 52.6 percent, Chinese at 51.4 percent, and Sabah Bumiputeras at 48.1 percent. Women were assaulted 58.19 percent of the time, compared to 41.81 percent of the time for men. Facebook topped the list of platform-based online harassment cases (67.6%), followed by phone usage (59.11 %), chatroom/forum (17.66 %), Twitter (14.75 %), Instagram (11.96 %), instant messaging (9.87 %), email (8.13 %), blog (6.62 %), and YouTube (4.3 %)(Mohd Arsad Johanis *et al*, 2020)[2]. According to MalayMail (2022), it was reported according by United Nations Children's Fund (Unicef), Malaysia ranks second in Asia in 2020 for cyberbullying among youth. The popular usage of social media platforms has becoming rife breeding ground for cyberbullying and toxic behaviour, not only among youth but adults as well[3].

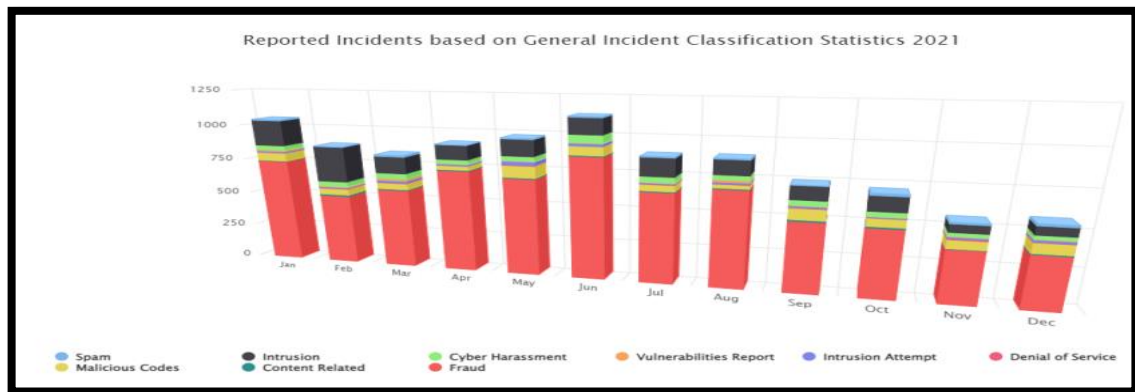


Figure 1: Report by MyCert on General Incident Classification Statistics in 2021

Based on statistic by MyCert in 2021[4] as shown by the chart below, the total number of reports for cyber harassment is 417 cases with more than 25 cases was reported monthly. Other than that, one study that was conducted by N. K. Tharshini, Faizah Haji Mas'ud & Zamri Hassan (2022) towards 332 respondents through online survey, found out that experienced a moderate (87.7%) level of online sexual harassment during the outbreak of the COVID-19 pandemic[5]. Therefore, online harassment is a serious offence that happens in our country.

The goal of this study is to look into factors and effects of online harassment and its legal protection. This study adopts a doctrinal legal research methodology to examine the Malaysian law and regulations regarding this issue. Academic journal articles from Current Law Journal for example, were used to look for primary and secondary materials related to the issues as well as news platforms were cited in getting information on online harassment. Lastly, Malaysian legislations from specific Communication and Multimedia Act 1998 (hereinafter referred to as 'CMA 1998') and Computer Crimes Act 1997 (hereinafter referred to as 'CCA 1997') and few cases are critically discussed within this context. This study started with discussion on causes and effects on online harassment, then analysing the existing Malaysia's laws and case

and lastly ended with ways to lodge report for online harassment and suggestion to curb online harassment issues.

2. ONLINE HARRASMENT AND LEGAL IMPLICATIONS IN MALAYSIA

2.1 Causes and Effects of Online Harassment

Online harassment is driven similarly to traditional harassment, in which bullies are fuelled by a lack of attention, a desire for aggression, or victims of violence. Online harassment victims may feel emotional anguish, which can lead to withdrawal from social networking sites or, in extreme situations, self-harm. Women are nearly twice as likely as males to list "fear of personal injury" as their biggest concern while engaging online, trailed by fears about their image. As a result of these worries, many victims opt to self-censor when using online communications platforms; in more extreme cases, such as when harassment happens over time, they may disable their accounts permanently (Maple, A, Short, E. & Brown A. , 2011) [6].

One of the most influential components in the conduct of online harassment is anonymity, which allows the attacker to harass or annoy the victim for up to 24 hours. Because of the anonymity, it is simpler for the perpetrator to harass the victim without having to reveal oneself and observe the victim's emotional response. Other factors influence online harassment, including internal factors, such as the personality characteristics of actors who are dominant, lack empathy for others, like violence, and seek sensations; environmental factors, such as family, school, and peers and the media. Cyberbullying victims in adolescence face a variety of negative outcomes, including substantial mental problems (e.g., anxiety and despair) as well as school-specific issues (e.g., absenteeism). Threats of violence or rape, the publication of intimate photographs or tapes, and doxing (the publication of private details such as a person's home address) are all likely to have an adverse impact on victims' well-being and make them feel defenceless.

Another factors that contributed to cyber stalking for instance based on the research by Zaiton Hamin & Wan Rosalili Wan Rosli (2018), suggested that the risk of cyberstalking was manufactured was through over sharing of personal information online or in social media applications. Moreover, the findings indicate that the regulators seemed to place individual responsibility onto computer users, in particular, the victim, in managing his or her risks because they were blamed for failure in managing their cyber stalking risks [7].

One of possible explanation in comparing online harassment whether it is more harmful to women than man, is that women react more strongly to online harassment because they receive comments of a different kind than men. For instance, the level of aggressiveness in the messages seems to matter more for women than for men, as there are larger gender differences in the consequences of hateful comments than unpleasant comments. Besides, women also receive proportionally more of the type of harassment that "hurts more," that is, comments directed toward who they are rather than toward their opinions [8].

2.2 Existing Laws Governing Online Harassment in Malaysia

The relevant laws that regulate online harassment in Malaysia are Section 211 and Section 233 Communication and Multimedia Act 1998 (CMA 1998) and Section 4 of the Computer Crimes Act 1997 (CCA 1997) to prosecute internet trolls.

Sections 211 and 233 of the CMA 1998 are Malaysia's main provisions that allow legal action against providers of offensive content on the Internet. According to Section 211 of the CMA, it was stated:

"(1) No content applications service provider, or other person using a content applications service, shall provide content which is indecent, obscene, false, menacing, or offensive in character with intent to annoy, abuse, threaten or harass any person. (2) A person who contravenes subsection (1) commits an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit or to imprisonment for a term not exceeding one year or to both and shall also be liable to a further fine of one thousand ringgit for every day or part of a day during which the offence is continued after conviction."

The CMA does not define the term "offensive content." Nonetheless, Section 6 of the CMA only describes the content as "any sound, text, still picture, moving picture, or other audio-visual representation, tactile representation, or any combined effect of the preceding which is capable of being formed, exploited, saved, recovered, or communicated digitally." However, Section 211 of the CMA categorises offensive internet content into five categories: indecent content, obscene content, false content, menacing content, and offensive in character. Nonetheless, Section 211 contains no definitions for these forms of objectionable internet content. On the other hand, the Malaysian Communications and Multimedia Content Code divides offensive material into nine categories: Indecent Content, Obscene Content, Violence, Menacing Content, Bad Language, False Content, Children's Content, Family Values, and People 6 with Disabilities.

Based on Section 233 of CMA 1998, this provision which deals with "improper use of network facilities or network service," uses similar language to Section 211. The concerns raised above about the provision's wording apply equally to Section 233(1)(a), fails to meet the legality standard and raises questions about necessity and proportionality due to the imposition of criminal measures, including imprisonment. Section 233(1)(b) prohibits "[initiating] a communication using any applications service, whether continuously, repeatedly, or otherwise, during which communication may or may not ensue, with or without disclosing his identity and with intent to annoy, abuse, threaten, or harass any person at any number or electronic address." This provision appears to be a penalty for anonymous speech. Besides, sharing offensive and threatening content is a violation of Section 233 CMA 1998 that punishable by an RM50,000 fine, a one-year prison term, or both. Even though Section 233 do not criminalise the cyberbullying offence in explicit terms, but rather the commission of any acts that fall within the ambit of such provisions are regarded as an offence. because it fulfils the criteria of harassing and offending others(Nurulhuda Ahmad Razali & Nazli Ismail Nawang, 2022)[9].

Other than that, Malaysia's Penal Code has been specifically mentioned in Section 4 of the CCA 1997 that committing a 'computer crime' with the intention to commit fraud or falsehood

or to cause pain as defined in the Penal Code is an offence under the CCA. Malaysian cyber laws make no mention of digital or computer-related identity fraud or identity fraud. However, it has been proposed that Section 416 of the Penal Code be extended to include identity theft. It is an offence under Section 416 of the Penal Code to "cheat by personation," which means that a person cheats by pretending to be someone else, or through wilfully replacing another individual for another.

Two example of cases will be discussed on online harassment. Firstly, The case of *PP v Sharul Nizam* [2019] 1 LNS 2076 This case started off when the accused, Sharul Nizam Ab Rahim, had posted several postings on his Facebook wall by using his own Facebook account that has a racism element in it. Among the racist statements made by the accused that can be found in this case are "...orang cina macam ni perlu kita layan sama macam bangsa rohingya. Aku pasti berdendam sampai kiamat!..." and "...kalau Negara ditadbir 100% ikut Perlembagaan Persekutuan, satu sekolah cina pun tak akan ada di Malaysia. Dana kerajaan juga hanya untuk Sekolah Kebangsaan dan bukan untuk Sekolah Jenis Kebangsaan...". His racist postings then were found by Chong Chin Chia and his friends, including Puspa Rani a/p Thanabalasingam when they were surfing their Facebook account. Furthermore, after finding out about the postings, Chong Chin Chia has left a comment about this issue on the accused's Facebook wall. Enraged with Chong Chin Chia's comment, the accused replied to it by threatening him and his family on the posting's comment section and not only that, the accused threatened him through the Facebook Messenger too. Chong Chin Chia then took 'screenshot' of the racism statements on the accused's Facebook wall by using his phone and further stated that he had received death threats from the accused on the same day as when he had left the comment and lodged a police report. The accused was arrested and charged with 6 charges under Section 233(1)(a) of Communication and Multimedia Act 1998 and one charge under Section 507 of Penal Code. The judge satisfied with the terrible statements made by the accused as it was completely seen to offend others. However, the main issue that needed to be decided was whether the racist postings came from the accused's Facebook account, and he was the person who posted the statements. The judge found that there is no statements from any of the witnesses to prove whether the accused was the person who wrote or released the statements including, Encik Mohd Khaidir Abdul Rahman, who was the witness for the prosecution, agreed with the respondent's suggestion that anyone can access the Facebook account that belongs to someone else. Hence, the Session Court judge has decided that the prosecution has failed to prove a prima facie case towards the accused for all charges. To conclude, the accused was released due to insufficient and non-solid evidence, but this case still falls under the provision of Section 233 of Communication and Multimedia Act 1998. This is since the postings were completely made to annoy other people by mentioning sensitive issues regarding race, and the accused has threatened the complainant as well, which is parallel to the main purpose of this provision to be enacted, which is to criminalise whatever speech is made with the intention of to "annoy, abuse, threaten or harass another person".

Secondly, the case of *PP v. Rutinin* [2013] 2 CLJ 427 show another example of online harassment case. The accused was charged with breaking Section 233 of the Communications and Multimedia Act 1998 in the Sessions Court. The fact of the case was that the accused had posted the remark "Sultan Perak Sudah gilaa!!" on the online visitor book of the homepage of the HRH Sultan of Perak. Telekom Malaysia Berhad confirmed that the Internet Protocol (IP) address used to publish the comment belonged to the defendant. They also discovered the computer's Media Access Control (MAC) address, which was utilised for the incriminating internet session at the time the derogatory comment was made. During the investigation, the

accused did not mention that the offensive statement could have been submitted by others. There was no proof that anyone else was using the device at the time. That 9 evening, the accused was present in his shop which was a repair store for cell phones. It wasn't a cyber cafe where anybody could have accessed the accused's device and account. The accused's workers did not claim to be using the device at the time or to have made the comment in question. They also did not say whether or not any particular customer had accessed the device at the occasion. The judge stated that Section 233(1)(b) of the Communication and Multimedia Act does not specify that the victim of the offensive remark must feel annoyed or abused. The provision only stated that the offender must have intention to annoy or abuse. Hence, it is sufficient if the comment made online has the motivation to cause annoyance or abuse to anyone. The posting in question says that the HRH Sultan of Perak is "gila" (mad). Although HRH was not called to testify, it is obvious that such a comment was intended to cause annoyance. Therefore, the prosecution had tendered sufficient inferential evidence to prove intention. Thus, the court allowed the appeal on the ground that there was enough evidence indicating the accused did post the offensive comment and had the intention to cause annoyance or abuse to HRH Sultan of Perak.

In summary, both cases display the existence of online harassment law which is Section 233 of the Communications and Multimedia Act 1998 and how it is applied in Malaysia. Although the act of leaving an offensive remark on the internet seems miniscule because it does not cause an immediate physical harm to anyone, if the perpetrator's intention is to abuse an innocent member of the public, he can be brought to court as he has committed a crime in the eyes of law. Despite that, in my humble opinion this provision does not protect the citizens as much as it protects the monarchs or bodies of authorities, and the perpetrator would not have been punished as heavily had he offended a normal citizen of Malaysia. This shows a crucial problem in guarding online harassment in Malaysia which is proving cybercrimes in court is tricky and not all cases will be successful. Cybercrime investigations plays important role in determining the outcome of the legal action, starting from gathering information, conducting digital forensics that involves the use of technology and scientific methods to collect, preserve, and analyse evidence and finally performing background checks by using public and private records and databases to find out the backgrounds of individuals potentially involved in a crime. Whenever an investigation is commenced, it frequently takes far too long to finish due to the difficulties of locating and connecting the relevant data, as well as conveying the findings to parties. Depending on the state and security of the disc drive and the complexity of the case at hand, the analysis could take anywhere from a few days to several months and years.

2.3 How Online Harassment Victims May Lodge Report?

There are few steps that can be taken for a victim of online harassment in protecting themselves. The chart below represents the process of lodge report to the authorities if online harassment occurs[10]:

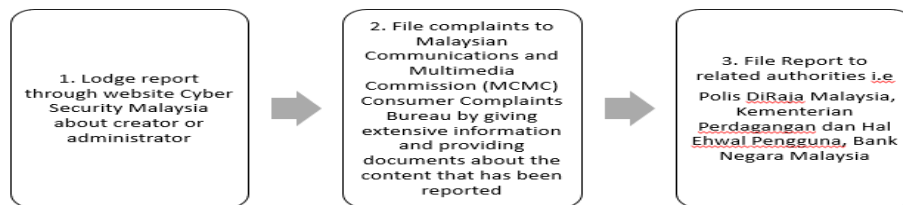


Figure 2: Steps to lodge report for online harrasment

The MCMC is not the only entity with the jurisdiction to lodge complaints about online content. All relevant legislations in the country apply to materials supplied on the internet, and reports/complaints can be filed to relevant enforcement agencies in connection to problems that come within respective jurisdictions. Another option is to file a complaint with the Malaysian Communications and Multimedia Content Forum at <http://www.cmcf.my/>, stating your full name and new IC number, mobile number, address, screenshots of the relevant content, and a link to the content are all required. Information about email transmission (Email Header), Claim/Demand, Description of Issues/Complaints.

3. CONCLUSION

All in all, online harassment is the act of sending messages or comments to a subject with the goal of creating psychological or mental damage. Online harassment can make a person feel discouraged or upset, which could also lead to a range of negative consequences. Although there is no specific legislation controlling online harassment on media platforms, there are several legislations that can be used to combat it, such as sections 211 and 233 of the Communications and Multimedia Act 1998, which were established to safeguard people's liberties against malicious online remarks. It does, however, rely on the judges' broad interpretation. As a result, specific provisions in the legislation should be included to provide authorities with more clarity and guidance. In addition, , specific provisions relating online harassment should be introduced to the Penal Code and the Communications and Multimedia Act 1998, specifically for sexual and non-sexual online harassment offences, to give authorities a better guidance and direction.

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I-CReST 2022:207-189 - Pendidikan Berasaskan Hasil (OBE): Hubungan Penyampaian Pensyarah dan Maklumbalas Penilaian Kerja Kursus bagi Subjek Penghayatan Etika dan Peradaban

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ABSTRAK

Pendekatan Outcome Based Education (OBE) melihat kepada pencapaian pelajar dalam mengaplikasikan pengetahuan dalam pembelajaran. Oleh itu, kajian ini dijalankan bagi mengenalpasti maklumbalas penilaian kerja kursus sesuai dengan penyampaian pensyarah. Selain itu, kajian ini akan mengenalpasti hubungan pendekatan penyampaian dengan aktiviti di dalam kelas yang paling berkesan. Sampel kajian ini terdiri daripada 215 orang pelajar yang mengambil kursus Penghayatan Etika dan Peradaban di Politeknik Sultan Idris Shah. Kajian ini berbentuk kuantitatif yang menggunakan instrument soal selidik. Analisis data dalam kajian ini menggunakan perisian Statistical Packages for Social Sciences (SPSS) menggunakan analisis korelasi pearson di antara penyampaian pensyarah dengan pelaksanaan penilaian kerja kursus pelajar. Hasil analisis menunjukkan terdapat perkaitan yang signifikan di antara penyampaian pensyarah dengan penilaian kerja kursus pelajar. Oleh itu, kajian ini mampu memberi penambahbaikan dalam penyampaian pensyarah dalam meningkatkan penilaian kerja kursus pelajar dalam subjek Penghayatan Etika & Peradaban.

Kata Kunci: Outcome Based Education; penyampaian pensyarah; penilaian kerja kursus

1. PENGENALAN

Berdasarkan Pelan Pembangunan Pendidikan Malaysia 2015-2025 (Pendidikan Tinggi) merangka 10 lonjakan utama. Salah satu inisiatif lonjakan 1 iaitu pelaksanaan sistem penilaian bersepadu yang menzahirkan pencapaian holistik pelajar hasil daripada pengalaman pembelajaran di IPT. Hal ini bersesuaian dengan Outcomes Based Education (OBE), OBE secara ringkasnya ialah suatu hasil pembelajaran yang terdiri daripada 3 perkara utama iaitu pengetahuan, sikap dan kemahiran [1]. Ketiga-tiga tersebut boleh diperolehi setelah pelajar tamat atau habis dalam pengajian atau di akhir kursus dan dapat diaplikasikan dalam kehidupan atau dalam pekerjaan mereka. Terdapat beberapa komponen dalam OBE itu Hasil pembelajaran/ Objektif pengajaran, aktiviti pembelajaran dan penilaian pembelajaran. Dalam OBE, fokus utamanya melibatkan proses yang berterusan dari perancangan, pelaksanaan, pemantauan dan penilaian. Proses tersebut tidak akan berhenti sehingga hasil pembelajaran tersebut dapat diukur di akhir suatu kursus atau di aplikasi oleh pelajar semasa dalam bidang pekerjaan.

Perkaitan OBE dan Hasil pembelajaran adalah kaitan yang sangat rapat kerana tanpa hasil pembelajaran, OBE tidak dapat dilaksanakan kerana tiada perancangan dalam menentukan hala tuju untuk diukur. OBE juga dalam erti kata yang lain juga pembelajaran berpusatkan pelajar oleh itu pelajar perlu didedahkan apakah hasil yang akan diperolehi oleh pelajar setelah tamat

sesuatu kursus atau pengajian. Oleh itu, pelajar perlu mempunyai kesedaran dalam mengetahui kekuatan dan kelemahan dan seterusnya memberi maklumbalas kepada pensyarah supaya kesedaran tersebut terus sampai kepada pensyarah tersebut dan membuat penambahbaikan dalam pembelajaran seterusnya [2]. Justeru itu, perlu banyak kajian yang boleh dijalankan dalam mengaitkan keperluan pelaksanaan OBE dengan tahap kefahaman dan kesediaan pensyarah yang menghadapi kekangan dalam pelaksanaan OBE.

Penyampaian pensyarah dalam menepati objektif pengajaran merupakan perubahan diharapkan dalam pemikiran, tindakan atau perasaan pelajar-pelajar akibat daripada sesuatu kursus atau program pendidikan [3]. Objektif pengajaran adalah menentukan apa yang pelajar terima pada akhir sesuatu pengajaran berakhir dan bukan berkaitan dengan bagaimana kaedah pengajaran.

Penyampaian pengajaran dan pembelajaran melalui aktiviti yang sesuai mampu membuka ruang kepada pelajar untuk menyesuaikan kaedah belajar dengan diri mereka sendiri tanpa ditentukan seperti kaedah tradisional yang ditentukan apa yang perlu pelajar pelajari [4]. Pelajar boleh menentukan kaedah mereka sendiri dalam kursus yang sama kerana kaedah objektif pembelajaran akan menentukan hasil selepas kursus tersebut tamat dan diukur melalui penilaian dan CQI secara berterusan. Kemudian, perubahan kepada struktur kurikulum akan berlaku selepas proses itu tamat. Perkara ini yang ditekankan dalam proses OBE kerana faktor tenaga pengajar merupakan factor utama dalam meningkatkan motivasi pelajar dalam kursus penghayatan etika dan peradaban [5]

Seterusnya, aktiviti di dalam kelas perlu sesuai dengan penilaian kerja kursus yang perlu dijalankan. Dalam kursus Penghayatan Etika dan Peradaban mempunyai 3 penilaian kerja kursus iaitu pembentangan, e-folio dan tugas berasaskan masalah. Semua penilaian tersebut menyumbang kepada Course Learning Outcome (CLO) iaitu dapat membentangkan topik dengan baik, dapat menerangkan topik dengan merentas bangsa di Malaysia dan dapat mencadangkan sikap yang positif dalam menghadapi cabaran kontemporari di Malaysia. Oleh itu, bagi melihat terdapat kefahaman pelajar dalam CLO tersebut, pensyarah perlu mengetahui maklumbalas pelajar di akhir semester, sama ada pensyarah menyampaikan pengajaran dan pembelajaran sesuai dengan kehendak CLO. Perancangan tersebut mesti dimulai dengan titik akhir iaitu dengan menentukan ciri-ciri graduan yang bagaimana diimpikan oleh pelbagai pihak termasuk institusi pendidikan dan industri. [6]

Justeru, fokus kajian ini ialah menentukan kompenan OBE iaitu penyampaian dan maklumbalas penilaian kerja kursus yang telah dilaksanakan dalam perancangan dan pelaksanaan yang menepati konsep OBE yang menekankan pembelajaran berpusatkan pelajar. Seorang pelajar dewasa mempunyai hala tuju sendiri dan pensyarah sebagai fasilitator untuk memastikan pelajar menyertai secara aktif dalam membimbing untuk pelajar mendapatkan pengetahuan [7]

Di dalam Kajian Ini Menetapkan dua (2) objektif kajian yang perlu dikaji bagi mendapatkan dapatan kajian.

1. Mengenalpasti maklumbalas penilaian kerja kursus sesuai dengan penyampaian pensyarah
2. Mengenalpasti hubungan pendekatan penyampaian dengan aktiviti di dalam kelas yang paling berkesan.

2. TINJAUAN LITERATUR

Terdapat banyak kajian berkaitan dengan pelaksanaan penyampaian dan maklumbalas penilaian kerja kursus yang telah dilakukan oleh ramai pengkaji. Oleh itu, dapat dibahagikan kepada 3 bahagian iaitu kajian lepas berkaitan dengan pelaksanaan kurikulum kursus, penyampaian pensyarah dan pelaksanaan penilaian kerja kursus.

Terdapat kajian berkaitan dengan pelaksanaan kurikulum kursus yang telah dijalankan yang menyatakan bahawa pelaksanaan kurikulum kursus Komunikasi dan Penyiaran Islam di politeknik berada di tahap yang tinggi kerana objektif kajian tercapai melalui capaian nilai min [8]. Begitu juga kajian yang dilakukan oleh Rusmawati & Mohd Isha (2018) menyatakan bahawa pensyarah memahami kurikulum kursus dengan memahami penyediaan jadual Spesifikasi tugas yang dinyatakan dalam kurikulum kursus [9]. Walaubagaimanapun, kajian tersebut tidak melihat kepada hubungan pencapaian pelajar dengan pelaksanaan kurikulum kursus tersebut dan hanya melihat kepada kefahaman pensyarah itu sendiri tanpa melihat dari sudut kacamata pelajar.

Bagi penyampaian pensyarah dalam pelaksanaan OBE, terdapat banyak kajian iaitu kajian oleh Nurul Ain (2012) menyatakan bahawa majoriti pensyarah di UTHM mengamalkan pelaksanaan OBE dari aspek penyampaian pengajaran dan pentaksiran [10]. Begitu juga kajian yang dilakukan oleh Amirruddin et al (2009) dengan mengukur kefahaman pelajar terhadap penyampaian pensyarah di dalam kelas kepada hasil pembelajaran yang ditetapkan [11]. Oleh itu, kajian yang mengukur berkaitan dengan hubungan penyampaian pensyarah perlu diteruskan bagi melihat usaha pensyarah tersebut melaksanakan penyampaian yang berkesan di dalam kelas dapat membantu meningkatkan mutu penilaian kerja kursus pelajar.

Bagi kajian pelaksanaan penilaian kerja kursus terdapat kajian yang dijalankan oleh Siti Rozaimah et al (2011) yang menganalisa projek pelajar berasaskan kemahiran generik seperti komunikasi lisan, penulisan dan kerja kumpulan [14]. Hasil kajian menunjukkan bahawa penilaian kerja kursus membantu pelajar dalam markah peperiksaan akhir. Terdapat juga kajian membentuk cadangan dalam pelaksanaan OBE iaitu pelaksanaan tiga domain secara bersama berbanding penggunaan domain afektif sahaja dalam penilaian kerja kursus.

3. METODOLOGI KAJIAN

Kajian ini merupakan kajian kualitatif dengan mengedarkan soalselidik kepada pelajar yang mengambil kursus Penghayatan Etika dan Peradaban pada sesi Disemberi 2020. Seramai 500 orang populasi yang terlibat namun sampel yang akan diterima sebanyak 215 orang sahaja dengan menggunakan kaedah persampelan Krejcie & Morgan [12]. Responden diminta memberikan respon ke atas Skala likert dan soalan ya dan tidak. Analisis data soalan soalselidik menggunakan SPSS dan respon dibentangkan dalam *pearson correlation*.

4. ANALISIS DATA

Berdasarkan analisis soal selidik yang telah dilakukan, terdapat 3 analisis menggunakan korelasi pearson bagi melihat hubungan yang paling signifikan di antara maklumbalas pensyarah, aktiviti pelajar di dalam kelas dan pelaksanaan penilaian kerja kursus pelajar. Tahap signifikan tersebut boleh dilihat dalam jadual di bawah:

Jadual 1: Hubungan di antara penyampaian pensyarah dengan maklumbalas penilaian kerja kursus

	Penyampaian pensyarah	Maklumbalas penilaian kerja kursus
Pearson Correlation	.794**	
Sig. (2-tailed)	.000	

Berdasarkan dapatan kajian yang telah dianalisis dapat dikenalpasti terdapat hubungan yang signifikan di antara maklumbalas pensyarah berkaitan kerja kursus dengan penyampaian pensyarah menunjukkan .794** dan penyampaian pensyarah dalam kelas menepati aktiviti dan diterangkan dengan baik. Tambahan pula, pensyarah juga memberi dengan waktu yang sesuai kaedah mencari rujukan bagi setiap aktiviti yang diberikan.

Berdasarkan Jadual 1, terdapat hubungan yang sangat signifikan di antara penyampaian pensyarah dan maklumbalas penilaian kerja kursus sebanyak .794*. Pensyarah banyak memberi tunjuk ajar dalam menyiapkan kerja kursus dan penyampaian pensyarah difahami pelajar. Tambahan lagi, pensyarah melakukan aktiviti sesuai dengan keperluan penialain kerja kursus.

Jadual 2: Hubungan di antara maklumbalas pensyarah dengan Pendekatan Pengajaran & Pembelajaran Pensyarah.

	Penyampaian pensyarah	Pendekatan Pengajaran & Pembelajaran Pensyarah
Pearson Correlation	.790**	
Sig. (2-tailed)	.000	

Pendekatan pensyarah dalam menyampaikan kerja kursus sangat berkesan dengan melihat hubungan yang signifikan sebanyak .790** dalam pendekatan dan penyampaian pensyarah berkaitan dengan kursus. Pensyarah juga sentiasa menunjukkan semangat dan minat dalam pengajaran dan penerangan penilaian kerja kursus yang baik dan difahami. Pensyarah sentiasa memberi cabaran dalam setiap kerja kursus yang diberikan. Sentiasa mempelbagaikan penyampaian instruksional dan juga mampu mempertingkatkan mutu kerja kursus pelajar dengan semangat dan memberi komen yang mencabar dalam mempertingkatkan lagi hasil kerja kursus pelajar.

Jadual 3: Hubungan di antara Pendekatan Pengajaran & Pembelajaran Pensyarah dengan aktiviti pensyarah di dalam kelas.

	Pendekatan Pengajaran & Pembelajaran Pensyarah	maklumbalas penilaian kerja kursus pelajar
Pearson Correlation	.739**	
Sig. (2-tailed)	.000	

Berdasarkan rajah di atas menunjukkan bahawa terdapat hubungan yang signifikan sebanyak .739** berkaitan dengan pendekatan pengajaran dan pembelajaran pensyarah dengan maklumbalas penilaian kerja kursus pelajar. Pensyarah sentiasa bersedia pada setiap kelas dengan topik yang akan diajar dan menggalakkan perbincangan dalam setiap soalan pelajar. Pensyarah juga memberi penerangan yang mendalam berkaitan dengan garis panduan untuk rujukan dan memberi maklumbalas selepas penilaian kerja kursus dihasilkan. Pensyarah juga sentiasa menunjukkan semangat dan minat apabila memberi tugas sesuai dengan kursus di ajar dan mampu memberi cabaran kepada pelajar dalam menjalankan tugas.

5. KESIMPULAN

Berdasarkan analisis data di atas dapat dilihat bahawa terdapat hubungan yang signifikan di antara maklumbalas penilaian kerja kursus dengan penyampaian pensyarah dengan melihat jadual 1 iaitu hubungan yang signifikan. Menurut Mohamad Johdi (2007) peranan pensyarah ialah menentukan objektif pembelajaran dan perlu diketahui oleh pelajar supaya pelajar sentiasa bersedia dengan mengetahui apa yang perlu dicapai selepas sesi pembelajaran tamat dan pensyarah boleh menguji dengan melihat keberhasilan pelajar diakhir sesi pembelajaran dalam menilai tahap pencapaian pelajar [13]. Oleh itu, dapat dijelaskan bahawa pensyarah mempunyai pengetahuan yang mendalam dalam mempelbagaikan penyampaian dalam kelas bagi menepati struktur hasil pembelajaran sesuai dengan komponen OBE yang diterima melalui bengkel, seminar atau kursus. Hal ini bersesuaian menurut Hasril (2018) yang menyatakan bahawa usaha pihak pengurusan dalam memastikan latihan dan pendedahan yang mencukupi kepada pensyarah dalam mempelbagaikan kaedah pengajaran sesuai dengan kehendak OBE [2].

Perbincangan bagi objektif yang kedua iaitu Mengenalpasti hubungan pendekatan penyampaian pensyarah dengan aktiviti di dalam kelas. Melalui objektif ini dapat dilihat dalam Jadual 2 mempunyai hubungan yang signifikan iaitu keberkesanan pendekatan pensyarah dalam P&P sangat merangsang minat pelajar dengan aktiviti yang sesuai dan pensyarah sentiasa menggalakkan soal jawab di dalam kelas melalui perbincangan. Pendekatan yang terbaik adalah dengan tidak memberi maklumat tanpa usaha pelajar (*Spoon feed*). Perkara ini masih membelenggu minda pelajar yang mengharapkan bantuan pensyarah dalam sebarang maklumat [14]. Maklumbalas pensyarah sangat penting dalam sesi P&P, menurut Nor Amanina (2013) proses P&P memerlukan kepelbagaian kaedah penyampaian supaya pendekatan pensyarah melalui aktiviti yang sesuai dapat menghasilkan perubahan tingkah laku pelajar yang bukan sahaja penguasaan ilmu pengetahuan tetapi perkembangan emosi, sikap dan ciri dalaman juga mempengaruhi pembelajaran pelajar [15]. Hal ini bersesuaian dengan pendekatan pensyarah yang sentiasa memberi maklumbalas kepada pelajar dengan hubungan yang signifikan dengan komitmen pelajar dalam setiap aktiviti yang boleh dilihat pada Jadual 2.

Melalui Jadual 3 terdapat hubungan yang signifikan bahawa pensyarah sentiasa berbincang dalam topik yang disampaikan dan pensyarah akan memberi maklumbalas setiap penilaian kerja kursus yang dijalankan. Perkara ini bersesuaian dengan pendapat Saemah (2011) Bahawa pembelajaran kolaboratif dan koperatif ialah pembelajaran secara berkumpulan bagi meningkatkan pencapaian, estim sendiri dan motivasi pelajar dan dapat membantu pelajar lebih bertanggungjawab dalam menyelesaikan konflik dalam perbincangan kumpulan [16].

Berdasarkan kajian di atas menunjukkan hubungan yang signifikan di antara penyampaian pensyarah dengan pelaksanaan penyampaian penilaian kerja kursus pelajar. Namun, tiada dilaksanakan hubungan di antara penyampaian pensyarah dengan struktur kursus kerana kurikulum kursus adalah mengikut kefahaman sesebuah institusi tersebut. Walaubagaimanapun, kajian lain yang boleh dilaksanakan dengan melihat pencapaian pelajar dalam markah penilaian kerja kursus bagi melihat keberkesanan domain kognitif, psikomotor dan efektif boleh dijalankan bagi melihat keberhasilan dalam keputusan pelajar.

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I-CReST 2022:229-214 - Fake News on WhatsApp and Its Impact Towards Media Trust: The Case of Malaysian Youngsters

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ABSTRACT

The advent of flurrying fake news is rampant and governments all over the world are trying to rebut this fake information as it has a fundamental impact towards the government's information delivery to its citizens. The alteration of news content either with malice intention or unintentionally is equivalent to spreading hearsay and inaccurate particulars. Fake news also affects the public's perception towards Malaysia media fraternity this will later affect media consumption. Society needs to understand that the content conveyed in fake news may be in the form of pictures and it could be categorised as an incident, defamation, or impersonation. The increase of fake news dissemination among youngsters is worrying and the survival of the media industry is at stake. Hence, this study aims to identify factors that contribute to the dissemination of fake news among Malaysian youngsters. The study also expected to explore the effects of fake news towards media trust among the youngsters, followed by identifying the challenges of fact checks available in Malaysia. Therefore, to achieve this, a qualitative study will be conducted through an in- depth interview. Interviews will be conducted to 65 respondents with a minimum of five years working experience in the media industry. WhatsApp found to be one of the main platforms used to disseminate fake news among youngsters. In turn, media credibility is also tarnished due to fake news followed by the lack of awareness on fact checks websites available in Malaysia.

Keywords: Fake news; WhatsApp; media trust; youngsters; Malaysia

1. INTRODUCTION

Merriam-Webster Dictionary described 'Fake news' as a political story which is seen as damaging to an agency, entity, or person. However, it said it is not restricted to politics, but is also inculcated in general news. According to the recent Reuters Institute Digital News Report 2022, 52 per cent of Malaysians share news via social, messaging or email and the top social media and messaging application is Facebook registering 52 per cent Malaysians seek news from its site while 74 per cent for others besides news. Meanwhile WhatsApp ranked in second with 47 per cent of Malaysians sought out news from their channel meanwhile 79 per cent of users utilise it for other than news. Consumption of digital media and digital news has continued to rise over the past year, coupled with increasing skepticism over official explanations, especially over the pandemic.

Malaysia with a population 33 million and 89 per cent Internet penetration would indicate that utilisation of social media platforms such as WhatsApp, an instant messaging application are widely used in the country to communicate and thus this study aims to explore the frequency

of fake news transmitted through WhatsApp; to determine the level of trust towards the Malaysian media fraternity; to unravel the effects of fake news towards media trust in Malaysia; and to identify Malaysian awareness on fact-check website -- sebenarnya.my and mycheck.my.

According to Malaysian Communications and Multimedia Commission (MCMC) a total of 3,285 complaints regarding content deemed to be fake news between 2020 and May 31, 2022 were disseminated in the country. There was a spike in fake news complaints in March 2020 related to COVID-19 but the trend had declined heading into 2021. Referring to (Zulkarnain Mohd Yasin, Azlee Nor Mahmud, Bernama, 2022) the common types of fake news revolve around impersonation or damaging reputation and the public tend to generalise it but in legal terms some of this fake news can be categorised as defamation of someone in nature. Fake news also includes impersonation utilising prominent individuals in the political, business or banking sector as endorsements for a particular investment venture or to be used as an investment recommendation to well-known individuals.

Society needs to understand that the content conveyed in fake news may be in the form of pictures and it could be categorised as an incident, defamation, or impersonation (Zulkarnain, et al., 2022). MCMC uses Section 233 of the Communications and Multimedia Act (CMA) 1998 to prosecute any parties involved in the provision of false and menacing content and not all significant complaints on fake news would lead to prosecution as the authorities faced many challenges in combating the menace. Tackling fake news is not merely charging the accused under the law but also taking administrative actions to the platform and hosting providers for the removal of the content or the fake news (Zulkarnain, et al., 2022). Media practitioners in the country were also lambasted by fake news as they are also the parties which douse fake news and as a result, public trust toward the media personnel or organisation credibility may also tarnish.

In terms of media trust, according to Reuters Institute Digital News Report 2022 the top three media outlets that garners the most trust among Malaysians is Astro Awani with 64 per cent, The Star (56 per cent) and Malaysiakini (54 per cent). According to the report Astro Awani and Malaysiakini remain at the top largely because of the balanced yet critical approach of the former and the independence of the latter. Applying a thematic analysis data collection from face-to-face and online questionnaires interviews distributions, this qualitative study aims to identify how WhatsApp users obtain and share fake news through 65 WhatsApp technology-savvy media practitioners in Klang Valley, Malaysia. The study also examines the impact of fake news toward media trust and sebenarnya.my and mycheck.my awareness as a source to annihilate fake information. The study aims to garner these following research objectives.

1. To explore the frequency of fake news is transmitted through WhatsApp.
2. To determine the level of trust towards the Malaysian media fraternity.
3. To identify the effects of fake news towards media trust in Malaysia.
4. To identify Malaysian awareness on fact-check website sebenarnya.my and mycheck.my.

Thus, the conceptual framework of the present study is illustrated in Figure 1 below:



Figure 1: Conceptual Framework

2. LITERATURE REVIEW

The recent Reuters Institute Digital News Report 2022 stated that the Internet penetration in Malaysia stands at 89 per cent in 2022, with Malaysian digital literacy among the highest in the region. With the heightened utilisation rate and access to the Internet, the country and other parts of the world face Big Data revolution of which vast and insurmountable amount of information is available and users find it difficult to discern what is real news and what is fake. Forms of misinformation, disinformation and mal information have been part of human vocabulary in all these years (Syed Arabi Idid, 2019). The idea of fake news has taken other dimensions with the advent of social media, and the rise of politicians and greedy manipulators bent on using fake news to promote themselves or their own organisation at the expense of their adversaries. Spreading rumours is part of the features of fake news, rumours spread on false pretenses, but in the years of old, they are conveyed and played about by word of mouth. A core feature of contemporary fake news is that it is widely circulated online (Bakir & McStay, 2018).

(Syed Arabi Idid, 2019) The characteristics of fake news are that they are:

1. Intentional;
2. False;
3. Deceptive;
4. Inaccurate;
5. Exaggerated;
6. Biased; and
7. Unacceptable.

As means of communication and the way users obtain news are diversified as per Figure 2 below, it has become a precursor for fake news. Malaysians are now more easily exposed to fake news than ever before (MCMC, 2019). Malaysians admitted to being disengaged with major news organisations as their preferred source of information and opted to rely on social media feeds instead (Zin, 2018). The report also showed that 63 per cent of Malaysians were unable to distinguish between true and fake news. Although it is reported that Malaysians are concerned about the spread of fake news, their reliance on social media to obtain information makes them increasingly vulnerable to fraud and fake news (Zin, 2018).

According to (Budd and Stewart, 2018), social media makes the dissemination of fake news easier, by spreading the ideas of people who otherwise would not have been heard, which can be both positive and negative. Meanwhile, (Fante, Silva and Graça, 2019) do not consider fake news as news, since it is unethical and exaggerates, contains double meanings, and disconnects society from journalistic information sources. Historically, fake news is not just news but a concept that is known in ancient governments when information is manipulated (Syed Arabi Idid, 2019). It is ancient transmission of wrong information with the evil intention

to bring down the reputation of others. Such rumour mongering is as devilish as they are today and is nothing new. Forms of fake news have existed several decades or centuries before and they are given a new coating because of the new technology.

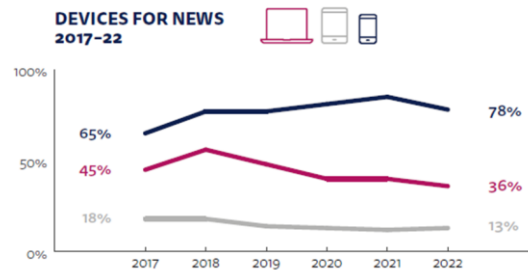


Figure 2: Devices used for News in Malaysia
(Reuters Institute Digital News Report 2022)

According to Reuters Institute Digital News Report 2022 these are the most often used devices in obtaining news in Malaysia which are tablets, computers, and mobile phones. Tablets ranked third with 13 per cent of Malaysians utilising it to seek for news and computers (36 per cent) of Malaysians look for news through it and the most used apparatus to get news is mobile phones (78 per cent).

Meanwhile MCMC's Internet Users Survey 2020 showed that Internet users accessing through smartphones have reached a near-saturation level at 98.7 per cent in 2020, up from 93.1 per cent in 2018, supported by the capabilities of smartphones with their powerful connectivity, efficiency and various functionalities and applications. Meanwhile, the survey observed a decline trend in accessing the Internet for other devices. The percentage of Internet users accessing Internet from laptop/netbook/notebook dropped to 37.9 per cent in 2020 from 44.2 per cent in 2018; while desktop decreased to 16.2 per cent from 28.1 per cent in the same period. MCMC Internet Users Survey 2020 also pointed out that 98 per cent of Malaysian leverage Internet for text communication; social media (93 per cent); voice/video communication (81 per cent); videos (87 per cent); financial transactions (64 per cent); gaming (43 per cent); music (65 per cent); online reading (68 per cent); and online shopping (64 per cent). Statista indicated that the number of social media users in Malaysia was estimated at 30.41 million in 2020 and (Nurhayati-Wolff, 2020) anticipate social media users to increase to 33.46 million in 2025.

Table 1: Malaysia's Top Social Media and Messaging Platform

TOP SOCIAL MEDIA AND MESSAGING

Rank	Brand	For News	ForAll	Rank	Brand	For News	ForAll
1	Facebook	52% (-4)	72%	4	Instagram	24% (+2)	50%
2	WhatsApp	47% (-7)	79%	5	Twitter	22% (+6)	33%
3	YouTube	39% (+3)	75%	6	Telegram	19% (-1)	45%

(Reuters Institute Digital News Report 2022)

According to Reuters Institute Digital News Report 2022 the most used social media that is used to seek news is Facebook registering 52 per cent, followed by WhatsApp (47 per cent) and third, YouTube (39 per cent). With mobile phones being the most used device in obtaining news and WhatsApp which ranked second in the 'Top Social Media and Messaging' platform, the study correlates with vast usage of WhatsApp on mobile phones in Malaysia which are also one of the main sources for fake news dissemination.

2.1 Fake News through WhatsApp

Although social networks, in general, are the channels through which disinformation spreads among friends and followers as automatic facts (Wardle & Derakhshan, 2017), the channel through which these doubtful contents circulate most effectively is WhatsApp. (Resende et al., 2019) analysed the distribution of misinformation in the instant messaging application over a time. They identified the most important sources for the spread of false images and their virality through WhatsApp groups and from there to other social networks and web platforms. These writers summarised that 'messages containing misinformation tend to spread more quickly within particular groups, but take longer to spread across different groups, making such messages last longer on WhatsApp' (Resende et al., 2019). The act of sharing is a matter of trust, meaning that when we trust the information and news shared through WhatsApp, we are more likely to share false news with others and less likely to check them out before resending them (Talwar et al., 2019). In an article published by The Star, the top five most prevalent fake news in Malaysia were reported as governance, crime, health, consumerism, and security (Lai, 2020). A total of 37 per cent of fake news was on government administrations while crime-related news accounted for 14 per cent of false news.

2.2 Fake News and Disinformation

In a 2018 the United Nations Educational, Scientific and Cultural Organization (UNESCO) report titled 'Journalism, 'Fake News' and Disinformation: A Handbook for Journalism Education and Training', the editors identified three specific types they called misinformation, disinformation, and mal information and it is very rare for such stories to be produced by most reputable traditional media outlets, partly because journalists are trained to be cynical and to verify facts. News outlets in the mainstream media undergo a process in accepting and in editing news adding that publishers and broadcasters know that their readership and audience numbers would return to them for news if they can continue to maintain trust and they would continue to maintain this trust if the news items that they put out are credible.

Ethics in the News EJA Report on Challenges for Journalism in the Post-truth Era revealed pointers on exposing fake news by using fact-checking websites. Most reputable media already double-check everything that arrives in their inboxes, but now freelance journalists and small-scale media can get help from a rapidly expanding community of online fact-checkers (Tengku Elena, Nur Syafiqah, Nur Aziemah, Daina Bellido, 2021). Sites such as factcheck.org in the United States or the United Kingdom's fullfact.org for instance and for Malaysia the websites would be <https://sebenarnya.my> and <https://mycheck.my>. The sebenarnya.my portal is a one-stop center for Malaysians to check before sharing unverified news, received online through social media platforms, instant messaging services, blogs, websites, and others, which aspires to nullify the spread of fake news online, while mycheck.my, although established by the Malaysian National News Agency (Bernama), it operates on an 'editorially-independent' basis

and is in compliance with international standards of the International Fact Checking Network (IFCN).

In the recent Edelman Trust Barometer 2022 found that the overall Malaysian media trust declined two per cent to 60 per cent in 2022 from 62 per cent last year. Meanwhile, Reuters reported in its latest report that Astro Awani ranked first with 64 per cent Malaysians trust their news content, followed by The Star (56 per cent) and Malaysiakini (54 per cent).



Figure 3: Brand Trust Scores in Malaysia
(Reuters Institute Digital News Report 2022)

According to Figure 3, an excerpt from Reuters Institute Digital News Report 2022, these are Malaysia's Media Trust Score. The media trust score is hand in hand with the Internet penetration of the country which stands at 89 per cent, with Malaysian digital literacy among the highest in the region.

2.3 Media Literacy against Disinformation

Education is the best "antidote" to the dangers posed by false information (Larkin, 2017; McDougall et al., 2019). According to (Badillo, 2019), "the lack of official or informal education procedures in the usage of new media" is clearly influencing how we perceive fake news.

The ideal age to introduce media literacy was echoed by (McDougall et al., 2018). Although some experts suggest waiting until the age of 13 because this is when logic and deduction are developed and reasoning is systematised (Jeong et al., 2012), (Nelson, 2016) highlights the beneficial effects that advertising training had on creators, sources, and

persuasion with American students aged eight and nine years and states that "Knowledge and education are by far the best weapons against fake news." 2018 (Valero & Oliveira).

According to (Buckingham, 2019), media literacy is the answer to all of the problems caused by false information. He claims that governments should be concentrating their efforts on controlling the media that are assisting in the dissemination of such content that impacts individuals' trust in and respect for democracies rather than holding education and citizens themselves accountable.

2.4 Critical Thinking

According to (Rodriguez-de-Dios et al., 2016), critical ability is "the capacity to critically analyse the information collected." It is not a first-level curricular necessity to learn how to discern, take the time to consider and reason about what is accurate and what is not, or what objectives a piece of information may have, before sharing it, and also make this method a habit, that is, to cultivate critical literacy (Tickle, 2018). The National Institute of Cybersecurity (INCIBE) advises kids to develop this skill by reading all the text, avoiding headlines that are very obvious, and double-checking an article's authorship, sources, and publication date as well as its consistency and reasonableness. Children can learn to conduct research and independently verify information by comparing the results of multiple Internet searches, according to INCIBE (Paula Herrero-Diz, Jess Conde-Jiménez, Salvador Reyes de Cózar, 2020).

3. METHODOLOGY

The study was conducted from June 2022 to early July 2022 and employed a qualitative approach. Utilising thematic method, adding likert scale qualitative interview questions, as well as in-depth interview to gauge feedback from respondents. The researchers used a purposive sampling method by relying on fellow journalists from a variety fields and organisations. Also, the strategy was used to limit to a small number of potential respondents (Palinkas et al., 2015).

According to (Englander, 2012), when selecting a sample size, the researcher must ensure that the respondents have the experience or knowledge needed to answer the research questions. Therefore, to be eligible, respondents were required to satisfy the following criteria: (1) aged 18 years and above; (2) media practitioners (3) social media user; and (4) have engaged fake news on their social media platforms. This sample included journalists, university students and public and private employees. A total of 65 respondents were approached and most of the questionnaires were distributed physically. Respondents were required to answer in front of the researcher, to enable any forms of questionnaire assistance and for the researcher to delve further insights for the study.

3.1 Research Design

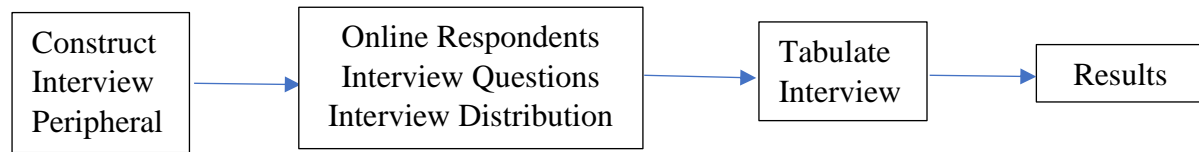


Figure 4: Research Design

As shown in Figure 4 the research design gives the direction of the research. The structure proposed was designed to determine the flow of obtaining study results on the frequency of fake news transmitted through WhatsApp, level of trust towards the Malaysian media fraternity and to measure fact-check website sebenarnya.my and mycheck.my awareness.

3.2 Instrument Development

Section	Items	Source
A	Demographic	
	<ul style="list-style-type: none"> Gender Age Locality Race Education Occupation 	Herrero-Diz P., Conde-Jiménez J., Reyes de Cózar S., 2020
B	WhatsApp Familiarisation	Tengku Elena T.M., Nur
	<ul style="list-style-type: none"> WhatsApp utilisation rate WhatsApp is important as it connects family kinship and more... 	Syafiqah A., Nur Aziemah M.A., Daina Bellido, 2021
C	Fake News	Syed Arabi Idid, 2019
	<ul style="list-style-type: none"> With new technology emergence, day by day it gets more difficult to differentiate fake news from real ones Social media and messaging platforms such as WhatsApp have enabled rampant fake news creation and circulation Media literacy, capacity to critically analyse information obtained before sharing news link is important 	
D	Media Trust	Tengku Elena T.M., Nur
	<ul style="list-style-type: none"> Malaysian media organisations are trustworthy 	Syafiqah A., Nur

-
- I am a WhatsApp fake news recipient from an alleged Malaysian media organisation
 - My trust towards the media firm recedes whenever I encounter WhatsApp fake news from the alleged Malaysian media organisation
 - Malaysian media often clarify fake news
 - Fact-check websites such as sebenarnya.my and mycheck.my helps me to verify information
-

Aziemah M.A.,
Daina Bellido,
2021

4. RESULTS AND DISCUSSION

From the data tabulated, the study utilises descriptive analysis from the data garnered and indicate data as it is from 65 respondents. Descriptive analysis is defined as the type of analysis of data that helps describe, show or summarise data points in a constructive way such that patterns might emerge that fulfill every condition of the data. It is one of the most important steps for conducting statistical data analysis.

In the study, out of 65 respondents, 67.7 per cent are females, while 32.3 per cent are males. In terms of age, 55.4 per cent are in the range of 31-40 years old, 23.1 per cent are 21 to 30 years old, while the remaining 21.5 per cent belongs to other age groups.

Majority of the 65 respondents are Malay (92.3 per cent) while Chinese, Indian, Bidayuh and Iban makes up for the remaining percentage. Additionally, education background of the respondents are namely postgraduate (40 per cent), undergraduate (44.6 per cent), diploma (9.2 per cent) and SPM/O-Level/Matriculation/A-Level/STPM were the remaining respondents.

Considering the researcher is employed by the Malaysian National News Agency (Bernama), most respondents derive from the same place of employment, namely government news officers, raking in 53.9 per cent, private media practitioners (27.7 per cent) and others (18.4 per cent).

On WhatsApp familiarisation section, all the 65 respondents have engaged in the application (app), however the rate differs with 87 per cent displaying frequent use of the app, often (9.2 per cent) and occasionally (3.07 per cent).

Fifty-two or 80 per cent respondents connects on a personal level on WhatsApp, indicating that it is the mode of choice to interact with family members and loved ones. Meanwhile 20 per cent of respondents are somewhat connected with family members on WhatsApp.

On the impact of technology advancement towards rampant fake news dissemination, 44.6 per cent strongly agrees, agrees (32.2 per cent), neither agree or disagree (18.5 per cent), disagree (3.1 per cent) and strongly disagree (1.5 per cent). Meanwhile 66.2 per cent strongly agrees that social media and messaging platforms such as WhatsApp has enabled vigorous fake news creation and circulation, followed by agree (27.7 per cent) and neither agree nor disagree (6.2 per cent).

On the importance of media literacy as well as capacity to critically analyse information obtained before sharing news link, 78.5 per cent of respondents strongly agrees, followed by agree (18.5 per cent) and neither agree or disagree (3.1 per cent).

On whether Malaysians are aware the repercussions of spreading fake news, strongly agrees were 16.9 per cent, agree (24.6 per cent), neither agree or disagree (27.7 per cent), disagree (24.6 per cent) and strongly disagree (6.2 per cent).

For Section D involving media trust, 21.5 per cent of respondents strongly agree that they trust media fraternity in Malaysia, agree (38.5 per cent), neither agree or disagree (30.8 per cent), disagree (7.7 per cent) and strongly disagree (1.5 per cent).

For Question 14 (I am a WhatsApp fake news recipient from an alleged Malaysian media organisation) and 15 (My trust towards the media firm recedes whenever I encounter WhatsApp fake news from the alleged Malaysian media organisation) of the questionnaire, the researcher had utilised the Pearson Correlation method in analysing the data.

According to Google, the Pearson correlation measures the strength of the linear relationship between two variables. It has a value between -1 to 1, with a value of -1 meaning a total negative linear correlation, 0 being no correlation, and + 1 meaning a total positive correlation.

The research indicated of a 0.497 score. The researcher was enabled to conclude that the correlation is not very low and is also not very high, most likely in the middle, which means there is some correlation between them but not very strong.

On fact-check websites such as sebenarnya.my and mycheck.my assist respondents to verify information, 36.9 per cent strongly agrees, agree (27.69 per cent), neither agree or disagree (21.53 per cent), disagree (4.61 per cent) and strongly disagree (9.23 per cent).

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Information on mycheck obtained from <http://www.mycheck.my/>
Research Questionnaire – Fake News on WhatsApp and its Impact Towards Media Trust: The case of Malaysian Youngsters <https://forms.gle/NAe5dTy5veBshSbo6>

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM)

I-CReST 2022:138-146 - KOMTREAT: New Bio Absorbent from Kombucha Bacterial Cellulose

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ABSTRACT

Over the decades, the quest of exploring materials with high stability, outstanding surface characteristics, well-developed pore structure, and abundance of surface functional groups is of paramount importance in wastewater pollution treatment. In this study, the development of a new, highly potential precursor for bio absorbent materials in produced using raw Kombucha bacterial cellulose (RKBC) and its biochar (KBCC). RKBC was pyrolyzed at 20 °C /min up to 500 °C to produce carbon-intense material. Both were then mixed at blending ratio of RKBC:KBCC at 100:0, 70:30, 50:50, 30:70 and 0:100. This product, also known as KOMTREAT were then applied to methylene blue solution for about one hour to determine its capability as absorbent for the colour removal. The analytical data on the application of KOMTREAT in methylene blue solution resulted in reduction of the color intensity, detected using UV-Visible spectrophotometer. Both RKBC and KBCC shows promising properties as bioabsorbent precursor with colour intensity reduction of more than 50% from its initial intensity. KBCC with 100 w/w% proved to be super-efficient for this specific purpose with 96% of the colour was removed. The absorbance efficiency also seems to be directly proportional to the amount of KBCC in the formulation. This indicates the potential of further application of KOMTREAT as water treatment alternatives in related industries for years to come.

Keywords: Bio adsorbent; bacterial cellulose; wastewater treatment; Kombucha; wastewater decolourization

1. INTRODUCTION

The development of pollution control advanced technologies for the treatment and management of wastewater produced by diverse industries has received a lot of attention over the past century, both in terms of research and development as well as applications. There are about 42 parameters stipulated under Environmental Quality (Industrial Effluent) Regulations 2009, in which concerning on different types of chemicals or contaminants in the wastewater. Final effluent discharge has withdrawn serious attention due to lack of concern and negligence from the industry player over the decades. The quest of exploring materials with high stability, outstanding surface characteristics, well-developed pore structure, and abundance of surface functional groups is of paramount importance in wastewater pollution treatment nowadays. In the treatment of wastewater, biochar is used as an adsorbent because of its cheap cost, little impact on the environment, and high efficiency. It is widely used for the purpose of removing contaminants from wastewater [1]. Because of its high stability, outstanding surface

characteristics, well-developed pore structure, and abundant surface functional groups, biochar has been extensively used in wastewater pollution prevention. Biochar is a porous carbon material formed by pyrolysis from biomass. Due to their high adsorption capacity, cheap preparation cost, and easy manufacturing process, biochar adsorbents have been a current research focus, and several varieties of biochar have been employed as adsorption materials to remove Pb (II) [2]. Due to its high stability, outstanding surface characteristics, well-developed pore structure, and abundance of surface functional groups, biochar has been extensively used in wastewater pollution treatment. The use of biochar technology to remove heavy metals, organic contaminants, as well as nitrogen and phosphorus nutrients, was primarily highlighted. After sugarcane bagasse, the scoby from kombucha is the second highest quality material favoured for the production of environmentally friendly products [3].

Kombucha is a naturally carbonated, non-alcoholic beverage made of fermented tea. Since its first discovery in Manchuria in 220 BC, the consumption of Kombucha tea as traditional health drink is thought to have started over 2000 years ago in northeast China [4]. It then reportedly made its way to Russia and Eastern Europe in the 1800s, and after that, during World War II, to Western Europe and North Africa [5]. Locally known as “Cendawan Mekah”, Kombucha also infamous by several names such as haipao, teakwass, tea fungus, Manchurian mushroom, and kambotscha are a few of the names for kombucha [6]. The market for kombucha has grown significantly over the past few years, reaching USD 1.84 billion in 2019 and expected to rise at a rate of 23.2 percent through 2027 [7]. The growth in popularity of kombucha is partly attributed to its alleged health advantages, which include raising immunity, easing IBS symptoms, assisting with weight loss, and lowering blood pressure, to mention a few. However, few clinical trials have been conducted to yet, and the majority of these claims lack scientific support [8]. The massive growth of the production also means abundance waste production from Kombucha beverage industry. During the fermentation, layers of cellulose might be produced from the symbiotic culture of bacteria and yeast (SCOBY). In recent years there has been a shift towards the use of alternative carbon and nitrogen sources, with the aim of increasing the functionality of the final beverage. Since its first discovery, this bacterial cellulose (BC) has demonstrated tremendous potential as a useful biopolymer in a variety of industries. Plant cellulose cannot compare to bacterial cellulose’s structural traits, which provide it better properties [9]. Production of BC sheets with a high surface area and porosity is made possible by fibril networks made of carefully aligned three-dimensional nanofibers. Bacterial cellulose, in contrast to plant cellulose, exhibits a number of special qualities, including a high degree of crystallinity, high purity, high water retention, high mechanical strength, and improved biocompatibility. Given its exceptional qualities, BC makes a perfect feedstock for the creation of a variety of industrial goods.

In this study, a novel type of bio-adsorbent material that could potentially be incorporated to the filtration system in wastewater treatment system is proposed. The product produced from combination of raw Kombucha bacterial cellulose and the biochar from similar precursor also known as KOMTREAT. While most bio-adsorbents in the market are made from charcoal residue produced by strongly heating wood, thus having environmental issues during its production, KOMTREAT on the other hand, is produced from bacterial cellulose collected from fermented tea also known as Kombucha tea. The main cellulose source of KOMTREAT which is the by-product from beverage industry serves as waste-to-wealth approach in this technology thus ensure the sustainability of the feedstock. This highly efficient bio-absorbent consist of 100 % pure cellulose that had been pyrolyzed at high temperature to remove all volatile matters.

1.1 MATERIALS AND METHODS

1.1.1 Preparation of Raw Kombucha Bacterial Cellulose (RKBC)

Bacterial cellulose was harvested from locally fermented Kombucha tea and was washed and cleaned prior to sun drying process for 24 hours. Then it was heated with sodium hydroxide (NaOH) solution until it reached a temperature of 90 to 100 °C. After all the samples were washed, the samples were dried for a week using the air-drying concept. For this stage, we have dried the samples in an open area without sun light. After 7 days of drying, the sample was pulverized and sieved through a progressively finer screen to obtain a particle size of < 212 µm. This was to ensure homogenous heating of the RKBC during the carbonization process later.

1.1.2 Preparation of Kombucha Bacterial Cellulose Biochar (KBCC)

Carbonization of RKBC was performed via pyrolysis process using a muffle furnace (Neytech 9493308 Vulcan Muffle Furcane, 550 Cu In). In this step, an amount of pulverized RKBC was weighed in a crucible and pyrolyzed in the muffle furnace at heating rate of 20 °C /min up to 500 °C. The sample was then allowed to be at 500 °C for about an hour to remove all volatile matters. The remaining carbon-intense material (biochar) was allowed to cooled at room temperature prior to the next process. Determination of functional groups existed in the KBCC was performed using Perkin Elmer Fourier-Transformed Infrared (FTIR) spectrophotometer at wavelength range between 4000-400 cm⁻¹.

1.1.3 Preparation of KOMTREAT

In order to improve the bio absorbent in terms of handling efficiency, the main materials were packed in form of sachet weighing around 0.5 gram each. Figure 1 summarizes the whole process of bio adsorbent preparation of KOMTREAT from its main material resources.

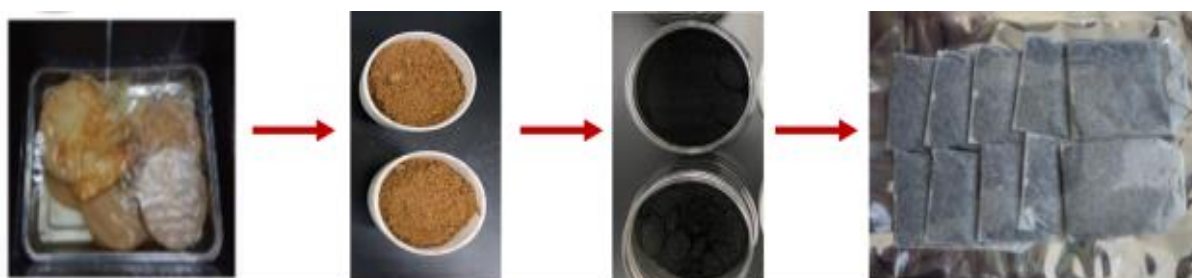


Figure 1: KOMTREAT preparation steps.

Five different blending ratios of RKBC and KBCC (100:0, 70:30, 50:50, 30:70 and 0:100) were formulated as shown in Table 1 prior to the packaging into the sachet form. To do this, raw pulverized Kombucha and biochar produced from the pyrolysis process were then mixed into three different ratios and packed in a sachet prior to the application study.

Table 1: Formulation of blending ratio for each KOMTREAT sachet.

FORMULA	RAW KOMBUCHA CELLULOSE	KOMBUCHA CELLULOSE BIOCHAR
1	100	0
2	70	30
3	50	50
4	30	70
5	0	100

1.1.4 Application of KOMTREAT for Methylene Blue Removal

In order to determine the best form of bacterial cellulose that might give highest absorption, each sachet was then applied to methylene blue solution and was left for one hour prior. Spectroscopy technique was used using UV-Visible spectrophotometer Cary 60 UV-VIS Spectrometer at fixed wavelength of 615 nm from Agilent Technology (USA) to determine the absorption efficiency of different blending ratio.

2. RESULTS AND DISCUSSION

2.1 Carbonization of RKBC via Pyrolysis Process

The carbonization of RKBC has been performed via pyrolysis process. It is the thermal decomposition of biomass in the absence of oxygen, resulting in the generation of carbon, liquids, and gases. Pyrolysis is a typical high-temperature treatment procedure for turning biomass into solids like biochar [10]. Slow or fast pyrolysis can be used to make biochar, however slow pyrolysis is more prevalent. Slow pyrolysis uses slow heating rates and lengthy residence durations in the absence of oxygen while fast pyrolysis is a high temperature process in which small biomass particles are quickly heated in the absence of oxygen. The heating rate has a considerable impact on biochar output and lower heating rates contribute to higher yields [11]. Table 2 shows the percent yield of KBCC obtained from the pyrolysis process.

Table 2: Formulation of blending ratio for each KOMTREAT sachet.

Materials	Initial weight, Wi (g)	Final weight, Wf (g)	Percent yield (w/w %)
RKBC	16.781	4.195	25

Figure 2 shows the FTIR spectrum of KBCC produced from the pyrolysis process. It is clearly observed that there are characteristic absorptions at 1650 cm^{-1} due to the presence of C=C bond stretching, 1573 cm^{-1} for C-C, 1410 cm^{-1} for C-OH, 1250 cm^{-1} for C-O-C, and 1150 cm^{-1} due to C-O functionalities. In addition, a broad absorption around 3400 cm^{-1} was observed due to the presence of hydroxyl groups (O-H) groups in the KBCC. Similar findings also reported by Amarasekara and Wang (2021) in their study of pyrolysis of Kombucha pellicles at different temperature [12].

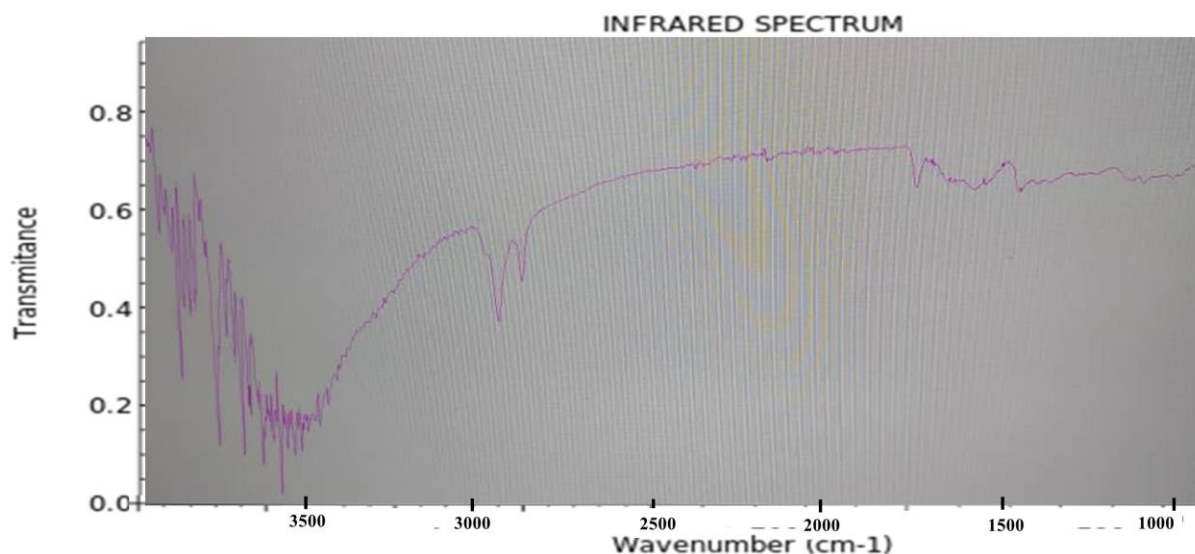
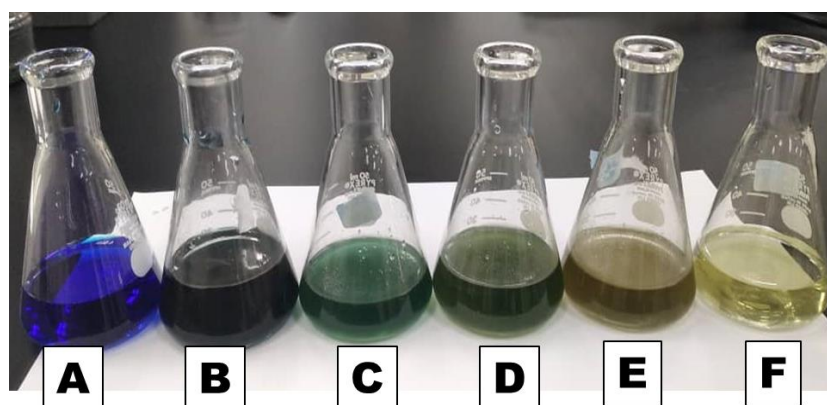


Figure 2: FTIR spectrum of KBCC.

2.2 Effect of Blending Ratio on Absorbance Efficiency

Figure 3 shows the difference between methylene blue solution (A) and the effect after sachet of KOMTREAT at different blending ratio was soaked in the solution for about one hour. It is obvious that the application of KOMTREAT to the solution shows significant reduction on the colour intensity. As the amount of KBCC in the sachet increased, the blue colour intensity decreased to some extent. At 100 w/w% of KBC, the blue colour seems to be totally removed, leaving a clear, light brownish solution. The colour might be due to the char particles suspended in the solution. Further filtration of the solution might results in total removal of the light brownish colour in the solution.



A: Methylene blue solution; **B:** Formula 1; **C:** Formula 2; **D:** Formula 3; **E:** Formula 4; **F:** Formula 5

Figure 3: Methylene blue solution before and after being treated with KOMTREAT.

In addition to the visual observation, the colour intensity reduction was also confirmed using spectroscopy technique. Table 3 summarizes the performance of KOMTREAT as bio absorbent for methylene blue removal.

Table 3: Absorbance performance of KOMTREAT at different blending ratio

Absorbance	Formula 1 (100:0)	Formula 2 (70:30)	Formula 3 (50:50)	Formula 4 (30:70)	Formula 5 (0:100)
Methylene Blue	3.777				
After one hour	1.733	1.713	1.352	0.614	0.149
Removal Percentage (%)	54.11	54.64	64.19	83.76	96.04

Based on the results, application of KOMTREAT in methylene blue solution has significantly reduced the color intensity. RKBC with 100 w/w% (Formula 1) shows the lowest yet significant colour intensity reduction of about 50% in comparison to the original solution. This might be due to the complex structure of cellulose which is the main component of the material. Meanwhile, biochar from the bacterial cellulose proved to be super-efficient in removing the color with 96% removal efficiency. This might be due to the surface area modification on the materials during pyrolysis process. Further morphological analysis on the surface and physical of the materials should be performed to confirm this trend.

3. CONCLUSION

Based on this preliminary work, it was found that Kombucha bacterial cellulose can potentially be applied as alternative materials for bio absorbance. The activation of Kombucha bacterial cellulose via pyrolysis process has successfully enhanced the absorbance capacity due to surface modification. However, further modifications on the raw materials and char are critically needed to increase the efficiency. Activation of the materials either using other chemical or physical approaches are suggested to suits its function in removing specific compounds or chemicals of interest. By doing so, the application of this materials as bioabsorbance could expanded towards various industrial field especially for wastewater treatment for years to come.

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I-CReST 2022:139-110 - Construction and Validation of a Modified Coloured Landolt C Acuity Chart: A Pilot Study

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ABSTRACT

The purpose of the study was to construct and investigate the validity of the modified coloured Landolt C acuity chart. The modified coloured Landolt C acuity chart and conventional Landolt C acuity chart (reference standard) were administered to one eye of 10 subjects of normally sighted young adults (mean age: 24.6 years). Outcome measures were monocular logMAR visual acuity scores for each test. The mean differences between the modified coloured Landolt C and the conventional Landolt C acuity chart data was -0.01 (95% CI, 0.008 -0.028) logMAR, indicating that the modified coloured Landolt C acuities agreed well with those of the conventional Landolt C acuity chart. The Bland and Altman's plot showed good agreement for the modified coloured Landolt C acuity chart as most differences in logMAR scores were placed within the limits of agreement (LoA). High correlations were obtained between visual acuity tests, thus providing validity evidence. The study demonstrated that the modified coloured Landolt C acuity chart test is capable of accurate and repeatable acuity measurements consistent with published data on the test-retest variability of acuities measured using 5-letter-per-line retro illuminated logMAR charts.

Keywords: Visual acuity; acuity chart; validation; coloured Landolt C

1. INTRODUCTION

In clinical practise, visual acuity (VA) is the most commonly used measure of visual function. Measurements of visual acuity are used to determine the need for clinical investigation and to quantify changes in central vision over time [1,2]. Primarily, visual acuity which represents a fundamental limit in the human visual system has been widely accepted and used in visual function assessment. To date, various visual acuity chart designs have been frequently used in research and clinical settings such as Snellen chart, Bailey-Lovie acuity chart and Early Treatment Diabetic Retinopathy Study (ETDRS) [3,4]. These charts are all constructed in high contrast of achromatic (non-colour) optotypes.

Though, in a real-world scenario of multi-contrast environment, there are numerous figure-background design being applied in our daily life that helps in information retrieval. Generally, colour is used to facilitate the perception, recognition and segmentation of objects, and efficiency of spatial vision. Studies on the background effect on colour text claimed that white background exhibited better visual acuity than grey background and increased visibility against a range of colour text [5]. However, colour combination in common communication platforms such as road signs, billboards, indoor signage is more complex than a simple white or grey background. Colour can be used in many possible combinations in the figure-background

design to deliver information that helps in increasing the visibility to assist space orientation and navigation [5].

Little is known about colour and its role in acuity measurements. There is a need to better understand visual acuity as a function of the colour element. Due to the recent developments in exploring the effects of colours on the visual acuity, the need for more investigations have been heightened [5,6]. However, most of the investigations were extensively emphasized from the application basis. A more fundamental study on various designs of colour figure-background in a controlled laboratory setting is necessary to understand the contribution of colour in information retrieval further. Hence, the present study aims to fundamentally investigate the validity of modified coloured Landolt C chart on visual acuity measurement. Therefore, in this study, we aimed to compare the performance of a modified coloured Landolt C chart against the conventional black-and-white Landolt C chart (reference standard) in a routine eye examination set-up.

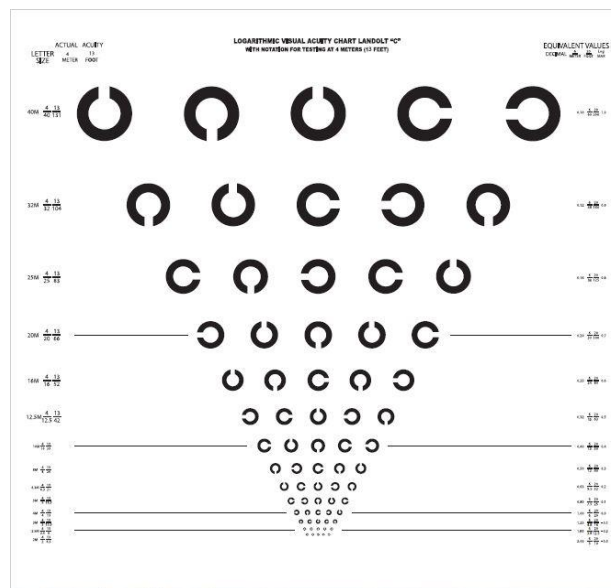
2. MATERIALS AND METHODS

2.1 Construction of Modified Coloured Landolt C Acuity Chart

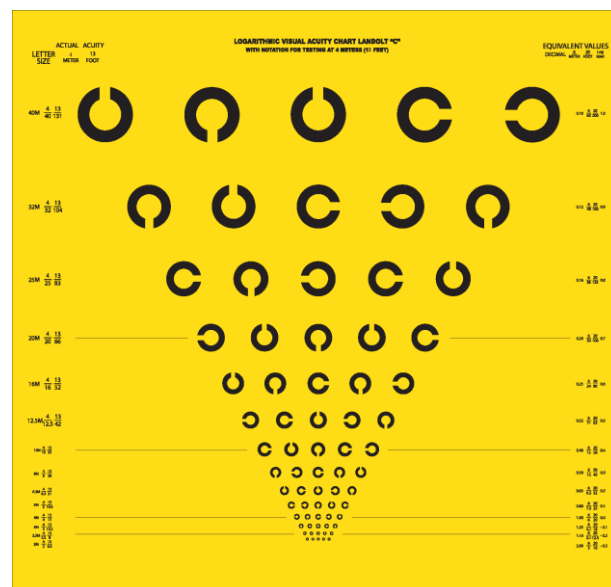
The modified coloured Landolt C acuity chart was constructed based on the established conventional Landolt C acuity chart (reference standard), but with an injection of colour element (Figure 1). Both charts were having a high contrast of 0.9. The target used was letter 'C' with four-position test. This chart has a size progression in steps of exactly 0.10 log unit. The spacing between rows was made equal to the height of the letters in the smaller row, in which it made the rows closer together as it reached from the top to the bottom. The reason of choosing letter 'C' as the main optotypes was to eliminate the diversity of letters, digits and other symbols used so that all optotypes in a set was evaluated for equal recognisability and calibrated to a standard test object. Landolt C was an interrupted circle whose stroke width and gap width are one-fifth of its outer diameter. Its major advantage was that it contained only one, easily measured, element of critical detail that represents the only difference between its various presentations. The four-position test has been shown to correlate better with common clinical optotypes.

The construction of the chart was using the Adobe Illustrator (AI) software. The colour was selected based on one of the colour code in road signage according to Jabatan Kerja Raya specification [7]. The target stimulus was letter 'C' constructed with high contrast optotypes. The chart constructions were based on the Bailey-Lovie logMAR chart where it comprised of the following characteristics:

Optotypes used	:	Landolt C
Height, min of arc	:	5.0
Width, min of arc	:	5.0
Spacing, min of arc	:	5
Height/stroke	:	5
Size progression	:	0.10 log units



(a)



(b)

Figure 2: The construction of acuity chart (a) conventional Landolt C (black-and-white); (b) modified coloured Landolt C

2.2 Procedure

The subjects wore their habitual correction. They were asked to seat comfortably on an ophthalmic chair at 4 m testing distance from the chart. The habitual distance visual acuity was then being measured monocularly (right eye). The subjects were required to give their response by indicating the orientation of the letter 'C's gap. For all measurements, the performance was scored and measured as the minimum angle of resolution (logMAR) at which the gap orientations of the letter 'C' correctly identified (right, left, top or bottom). Guessing was encouraged but testing was stopped when it became evident that no further readings could be made. The stopping rule was followed based on the recommendation by Carkeet, when four

mistakes were made in one row [8]. The scoring was based on letter-by-letter since it provides a more precise measure of visual acuity [4].

2.3 Validity Study

This study adhered to the tenets of Declaration of Helsinki and was approved by the Research Ethics Committee of the Universiti Teknologi MARA. Ten subjects were tested in this pilot study. The age range was from 24 to 26 years. The mean age was 24.63 years. The modified coloured Landolt 'C' or the conventional Landolt C acuity chart was selected randomly to be performed first. All participants were screened with a D-15 colour vision test to rule out any known colour deficiencies. Although the test as a screening tool is time-consuming, it was able to provide details on the status of the participants' colour vision. Since the D-15 colour vision test is specifically designed for detecting all types of colour deficiency, it can be used to examine acquired and congenital, red-green and blue-yellow defects, which the Ishihara test was incapable of detecting [9]. Hence, the D-15 test was considered important as the current study involved colours and required all of the recruited participants to have passed the colour vision test.

3. RESULTS AND DISCUSSION

The monocular distance visual acuity for the modified coloured Landolt C and conventional Landolt C acuity charts were summarized in Table 1.

Table 1: Descriptive data of logMAR between modified coloured Landolt C and conventional Landolt C acuity charts

Variable	Modified coloured Landolt C chart Median (IQR)	Conventional Landolt C chart Median (IQR)
Visual acuity (logMAR)	0.00 (0.08)	-0.04 (0.10)

Bland and Altman plot (Figure 2) showed a good agreement of minimum angle of resolution (logMAR) between the modified coloured Landolt C and the conventional black-and-white Landolt C acuity chart. The mean difference of minimum angle of resolution was -0.01 LogMAR. The limit of agreement ranged from 0.008 LogMAR to -0.028 LogMAR.

There is global agreement among clinicians regarding the sort of visual acuity chart that should be used for studies. It is crucial to have the same standard of acuity measurement in both the research and clinical contexts. Due to their superior construction and design to the conventional Snellen chart, the logMAR visual acuity charts are the gold standard for clinical research [10]. This study proved that the modified coloured Landolt C acuity chart may produce acuity statistics that very closely resemble those generated by the gold standard logMAR chart. Our finding is supported by the narrowness of the confidence limits created around the mean and a mean difference of VA measurements between the two designs that is closer to zero (Figure 2) [11].

As evidenced by the good agreement between the two charts, the addition of colour to the chart's background does not interfere with the capacity of the person to resolve fine detail. This provided insight into how crucial luminance is in maintaining good resolution by enhancing

contrast. The coloured acuity chart can therefore be used to measure acuity similarly to the traditional acuity chart.

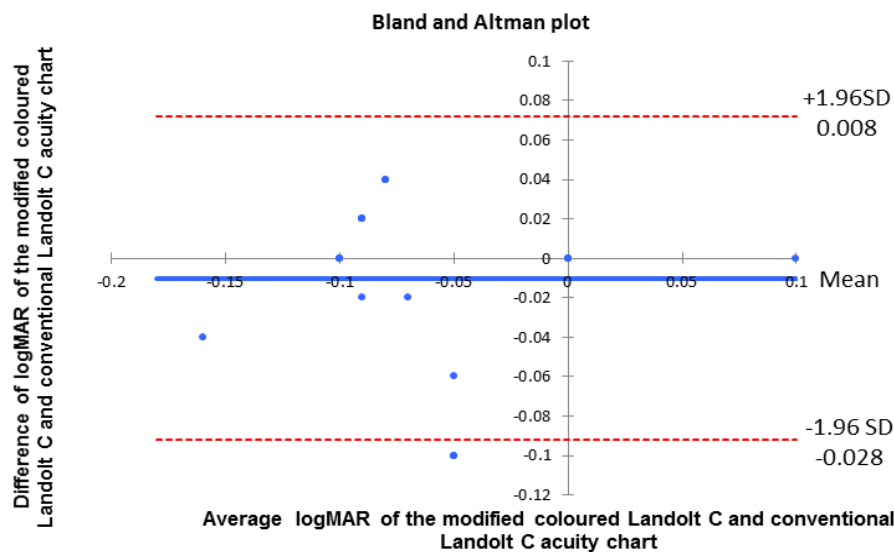


Figure 2: Bland and Altman plot for validity evaluation of the coloured Landolt C chart. The blue line shows the mean difference, the limits of agreement by the upper and lower dotted red lines and the 95% CIs.

4. CONCLUSION

In conclusion, the modified coloured Landolt C Chart was found to be highly comparable and has good agreement with the conventional standardized distance visual acuity charts (black-and-white Landolt C). Therefore, the new constructed modified coloured Landolt C acuity chart can be used in measuring distance visual acuity in the research settings. The results provided information on colour that it is substantial for visual acuity as it provides high discriminative power. The rationale behind all these studies demonstrated that colour coding is an important element in the measurement of colour resolution. It is also vital for information retrieval and needs to be well-defined to benefit individuals with normal colour vision along with those with colour defects.

Although the goals of this study were achieved, there were still some limitations and shortcomings that could be improved in the future. Further preliminary study on the repeatability of the modified coloured Landolt C Chart is needed to further strengthen the validity of the modified coloured Landolt C acuity chart. Secondly, this study drew its sample from a relatively small group of young adults. Therefore, the results might not be suitable to generalise and extend to other populations of different ages. Further studies with a larger sample size are therefore needed to better generalise the results to a normal population.

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