

SOCIAL and MANAGEMENT RESEARCH JOURNAL

Research Management Centre (RMC)

Vol. 17 No. 1

Mac 2020

ISSN 1675-7017

- 1. Information Seeking Behaviour among Millennial Students in Higher Education** **1**
Shamila Mohamed Shuhidan
Wan Aida Wan Yahya
Azma Asnawishah Abd Hakim
Husain Hashim
Shuhaida Mohamed Shuhidan
Norizan Anwar

- 2. Students' Motivation Level in Gamification of Accounting Teaching and Learning – A Case of 'Accounting on the Block'** **17**
Junaidah Jamaluddin
Mahathir Mahali
Norlaila Mohd Din
Mohamad Azmi Nias Ahmad
Nur Syazwani Mohamad Fadzillah
Faizan Abdul Jabar

- 3. Study on Green Energy Converter for the Purpose of Optimising Teaching and Learning in Energy Science** **35**
Azrul Nizam Alias
Mardhiatul Najwa Md Ab Lazis

Julyle Muhamad Sugandi
Nurfasyarina Azureen Mohd Salman,
Muhammad Hafiz Mohd Khalid
Rafael Julius
Noor Fadhilah Mohamad Sahapini
Mohd Ashmir Yahya
Zulfadli Mahfodz
Fariesha Farha Ramli
Fathiah Abdullah

4. Effects of Gender on Leadership, Entrepreneurial Orientation and Organisational Performance 49

Ahmad Fadhly Arham
Nor Sabrena Norizan
Nurliza Haslin Muslim
Azwin Aksan

5. Multitasking and Job Satisfaction amongst Secondary School Teachers at the District of Klang, Selangor Malaysia 61

Leele Susana Jamian
Mohd Syarudin Mohd Nazir
Gurnam Kaur Sidhu
Khairunnisa Othman
Norshiha Saidin

INFORMATION SEEKING BEHAVIOUR AMONG MILLENNIAL STUDENTS IN HIGHER EDUCATION

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Received: 16 Oktober 2019

Accepted: 24 January 2020

Online First: 28 February 2020

ABSTRACT

This paper investigates various information seeking behaviour demonstrated by millennial students in higher education. The impact of disruptive technology changes the students' information seeking behaviour as millennial students nowadays depend on the Internet too much to locate the information for their academic purposes. Studies also found that millennial students have difficulty in learning and were marked by uncertainty because they are facing information overload, inability to obtain and evaluate the information. Identifying and recognising appropriate information seeking processes is crucial in determining the effectiveness of the information-seeking behaviour and the quality of the information gathered in order to support their learning process and experience. Therefore, this paper focuses on the behaviour applied by these students to fulfil demands of academic compliance especially in efforts to seek research-based information. About 328 students took part in this online survey. Findings of this research use quantitative descriptive analysis. From the findings, respondents claim that they are familiar with information seeking processes with mean value is 3.63,



however 30.5% respondents claim they still lacking in information seeking skills. This research provides a valuable insight regarding the information seeking behaviour of millennial students and make a recommendation that role of modern libraries should facilitated this demand by ensuring that services such as online library resources are accessible and set-up for use by the millennial students.

Keywords: *information seeking process, information seeking behaviour, millennials, academic purposes, higher education*

INTRODUCTION

Heidar Mokhtari (2014) explained, 'Searching various information resources is the routine way to identify and access the information needed to build knowledge in academic contexts and daily-life.' Nowadays, the development of modern libraries provide online information retrieval systems such as online catalogues, library resource sharing network systems and online networked databases. However, demands on knowledge enhancement and growth within a learning environment requires the acquisition of a set of skills specifically related to information seeking needs and the development of information seeking behaviour as a means of overcoming this overwhelming experience. This study is based on a group of students undergoing a research methods class at an institute of higher education. It would be expected that these students would utilise the facilities and technologies on hand to assist them in achieving their given tasks. However, from past research it has been found that students do not fully use library information resources provided. By which, students are said to frequently learn how to complete school assignments through trial and error (Gunn & Hepburn, 2003). Therefore, the objectives of this research are to identify the processes undertaken by millennial students of higher education in applying information seeking processes, as a reflection of information seeking behaviour, for academic purposes and to identify the challenges that these students face.

Millennial students are the generations that was born in the year of 1981 till 1996, and anyone born from 1997 onward will be part of post-millennials

as reported by Pew Research Center (2018). These millennial generations are still very much dependent on the Internet in their daily life. However, their focus may not be so much on information seeking processes for academic reasoning but a demonstration of information seeking behaviour. Students are exposed to mass information on a secondly basis causing them to gather, filter and discard information that is deemed useful or otherwise. Responsibility in managing various information during the process of acquiring, storing, processing and using of information demands for an ethical framework among information professionals such as librarians and carers of information (Hoq, 2012). In his article, Hoq explores notions of the moral dilemma, factors that influence decision making, as well as, making the right decisions. However, the conducts outlined need to be taught and embedded in users of information such as that of the millennial student to ensure that the use of this information is not abused. This paper therefore investigates the information seeking processes of students of higher education in order to identify the content of information seeking behaviour and what are their challenges in seeking information for academic purposes.

LITERATURE REVIEW

There is a significant amount of research aimed at how secondary students or adolescents use new trends in new technologies and what factors influence their searching behaviour related to learning processes (Graafland, J. H., 2018; Buchanan, S., & Tuckerman, L., 2016; Wu, D., & Cai, W., 2016; Pilerot, O., 2016; Al-Muomen, N. *et al.*, 2012, Morris, A., & Maynard, S., 2012; Kuhlthau, 1993; Fidel *et al.*, 1999; Hess, 1999). Most researchers have investigated search behaviours using electronic resources in order to interpret patterns in the learning process.

American Library Association, (American Library Association Presidential Committee on Information Literacy, Final Report, 1989, p.1) defined information literacy skills as ‘be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information’. Students use computers and access the Internet for their assignments and also for personal purposes. In recent higher education learning environment, students are increasingly using electronic resources

to support their information needs (Vignarajah *et al.*, 2016; Madden *et al.*, 2007; Large, Beheshti & Rahman, 2002). The study by Civilcharran *et al.*, (2015) indicates that the students of higher level of education have spent more time searching information through Web. Therefore, understanding the ways they use electronic resources has implications for information seeking processes and their information literacy skills.

Information seeking is a process of searching, obtaining and using information for a purpose when a person does not have sufficient prior knowledge (Vakkari, 1990). Ramirez *et al.* (2002, p. 217) defined interpersonal information seeking as ‘the pursuit of desired information about a target’. The study indicates that students in universities gained the knowledge for searching information on the Internet through self-experienced as compared to be given formal training (Civilcharran *et al.*, 2015). Vignarajah *et al.* (2016) discovered there are difference ways of using library for information needs between students in universities. Their information seeking behaviour is significantly difference between first-year and post-first-year students in using the Internet search engines as information-seeking process. The senior students were being more impacted by their mastery experiences, affective states and social feedback (Bronstein, J., 2014). Among factors that give influences to information seeking behaviour were the speed and ease of accessibility, and the students’ familiarity with the sources needed (Tury, S., Robinson, L., & Bawden, D., 2015).

Kuhlthau (2004) saw information seeking as a learning process. People will seek information ‘to broaden their understanding of the world around them and information seeking is a primary activity of life’. Furthermore, Kuhlthau suggested that the systems designed to provide the information should be matched with the information in the process of learning. Meanwhile information seeking strategies is a part of information-seeking process which explain what strategies information seeker does in order to seek information. This research adopts Kuhlthau’s (1993) model that identified six stages of information search process (ISP) with each stage encompassing three aspects: cognitive /thoughts (what is to be accomplished), affective/feelings (what the searcher was feeling), and actions/physical (what the searcher did) or strategies/ physical (what the searcher trying to achieve). This then identifies the objectives and associated research questions for this research.

According to Komissarov and Murray (2016), the instructors and librarians in universities have positive influence for students' information-seeking behaviour, thus give opportunities for their success. Therefore, in order to create an information literate person, lecturers and librarians should be aware of the importance of the value of information gained (such as resource selection, database searching, and database searching techniques), information evaluation (especially information retrieved from the Internet), information usage, electronic citation styles, and techniques for analytical thinking (Kamal & Othman, 2012).

RESEARCH METHOD

This study used descriptive and quantitative approaches to identify students information-seeking processes for academic purposes. Neuman (2006, p. 33) defines exploratory research as 'research in which the primary purpose is to examine a little understood issue or phenomenon to develop preliminary ideas and move toward refined research questions by focusing on the 'what' question'. According to Neuman (2006) the main reason for using descriptive research is to 'paint a picture' using words or numbers to present a profile, which may include a graph or tables to illustrate the narrative. Online questionnaires were used for data collection and SPSS version 28 for the quantitative data analysis.

The online questionnaires were design to cover the research questions of the study. This includes identification of information-seeking processes, problems and challenges in seeking information, and suggestions from respondents on how to improve information-seeking processes for students in higher education. Sections A and B were designed specifically to ascertain student demographic data and knowledge of the information seeking processes. Meanwhile, in Section C, the items in the questionnaire were selected from Kuhlthau's previous instruments of the Information Search Process (ISP) for higher education students. This study uses the non-probabilistic sampling strategy, which is commonly known as purposive sampling. Based on Neuman's description (2006, p. 22), purposive sampling is 'a valuable kind of sampling for special situations and it is used in exploratory research for the judgement of the selected sample population'. The respondents for this research are from four faculties within four cluster in

one institution of higher education, and they were considered to be exposed to and have experience of the phenomena under investigation (information seeking processes in academic setting, for research methodology classes. For this study, the research objectives and research questions as follow:

This research focuses on two main questions:

1. What are the processes undertaken by students when searching for information for academic purposes?
2. What are the challenges that students face when searching for information for academic purposes?

The objectives of this research are:

1. To investigate the processes undertaken by students when searching for information for academic purposes.
2. To identify the challenges that students face when searching for information for academic purposes.

FINDINGS

Findings of this research derived from quantitative descriptive analysis on what are the processes undertaken by students when searching for information for academic purposes and their challenges faced by university students when searching information for academic purposes. About 394 university students enrolled in the research methodology course from four different fields or faculties, however 328 students took part in this online survey. All of the results were analysed using the Statistical Package for Social Sciences (SPSS), whereby ranges of descriptive analysis were presented using frequencies to examine the distribution of the responses.

Table 1: Demographic Profiles

Demographic Variables	Measures	Frequency	Percentages (%)
Faculty/Cluster	Faculty A/ Management	131	39.9
	Faculty B/ Humanities	87	26.5
	Faculty C/Social Science	36	11.0
	Faculty D/Science & Technology	74	22.6
Mode of Study	Fulltime	221	67.4
	Part time	107	32.6
Level Programme	Undergraduate (Bachelor's Degree)	284	87.6
	Postgraduate (Master's Degree, Doctoral Degree)	44	12.4
Age	18-22 Years Old	117	35.6
	23-27 Years Old	141	43.0
	28-32 Years Old	35	10.7
	33- 37 Years Old	35	10.7
Gender	Male	116	35.4
	Female	212	64.6

Out of the 328 samples in this study, 131 respondents or 39.9% from Faculty A, while 87 respondents or 26.5% are from Faculty B, followed by 74 respondents or 22.6% representing Faculty D and remaining of 36 respondents or 11% from Faculty C. The total number of the undergraduate respondents was 284 or 87.6% of the entire sample and the postgraduate respondents contributed only 44 or 12.4% of the research sample. The main respondents were people aged between 23 until 27 years old which

was 141 or 43.0% out of the 328 total of the samples. It was followed by 117 respondents or 35.6% for the aged between 18 until 22 years old and 35 respondents or 10.7% for the aged 28 until 32 years old and while 33 years old and above share are 35 or 10.7% total respondents each. The total number of the male respondents was 116 or 35.4% of the entire sample and the female respondents contributed 212 or 64.6% of the research sample.

Table 2 : Information Seeking Process for Academic Purposes

Items	Mean	Standard Deviation
I use more than one search engine to find the information	3.70	1.551
I search information by myself	3.86	1.008
I get help from someone to find the information	3.35	0.993
I need someone to assist me to search the information	3.23	1.035
I have difficulty to find information	2.77	1.007
I utilise the search tools in locating information	3.45	0.958
I locate the printed sources and materials by scanning it	3.19	0.982
I use web environment to search the information	3.81	0.969
I am concerned with the type of publication to use for my course assignments	3.55	0.919
I use a variety of search methods to find information online	3.44	1.026
I discuss with others (lecturers, friends,) about the information	3.59	1.013
I recheck, evaluate and verify the quality of the information	3.63	0.964
Total Average	3.63	0.964

From the Table 2 above, there are 12 items measurer the perception on information seeking process. Likert scale used in this study is between 1 (strongly disagree) to 5 (strongly agree). The results found that the repondents were agreed that *I search information by myself* (mean=3.86)

followed by I use web environment to search the information (mean=3.81), I use more than one search engine to find information (mean=3.70), I discuss with others (e.g: lecturers, friends, etc) about the information (mean=3.59), I recheck, evaluate and verify the quality of the information (mean=3.63), I am concerned with the type of publication to use for my course assignments between popular (opinion-based) and scholarly (research-based) sources (mean=3.55), I utilise the search tools (e.g: catalog, index, abstract, etc) in location information (mean=3.45), I use a variety of search methods to find information online (eg: wildcard, Boolean operator and, or,not, etc) (mean=3.44), I get help from someone to find information (mean=3.35), I need someone to assist me to search the information (mean=3.23), I find and locate the printed sources and materials by scanning them directly from the shelves (mean=3.19) and I have difficulty to find information (mean=2.77). As overall of Information seeking processes findings , respondents familiar with it, as the results of mean value is 3.63.

Table 3: Challenges that Students Face When Searching for Information for Academic Purposes

Catagories	Frequency	Percentage (%)
Limited Internet access	208	20.7
Technology literacy	202	20.1
Unfamiliarity role of library	266	26.4
Information seeking skills	307	30.5
Others	23	2.3
Total	1,006	100

The Table 3 above illustrate the types of challenges that respondents encounter in searching the information. There are eight items and been categorised into five main categories (as in Table 3). It shows that 30.5% respondents claim they still lacking in information seeking skills (i.e. *Inability to seek, obtain and evaluate information and inadequate skills in information seeking process*). It then followed by 26.4% of respondents *unfamiliarity with the oraganisation and mission of academic library, and hesitant to approach reference stations (desks/counters) and professional librarians*). About 20.7% of the respondents agreed that they are also facing difficulty in limited network and Internet access. The remaining of 20.1%

and 2.3% claim that they have difficulties in technology literacy and others such need proper guidance from lecturers and friends.

DISCUSSION

This research provides a valuable insight regarding the information seeking behaviour of millenials students for academic purposes as these generations are rely on so much on the use of the technology to support their learning processes. From the study, it found that as overall of information seeking processes findings, respondents familiar with it. Students demonstrate that they can search information independently in searching information for academic purposes. This results consistent with Civilcharran *et al.* (2015) indicates that the students of higher level of education have spent more time searching information through Web independently. Students agreed that their information seeking processes higly involved with the web environment and normally use more than one search engine to locate information from various types of publication resources. Students tend to recheck the information found with lecturers and friends. Finding show that students declare that they do have a difficulty to find information. As web environment become an integral fundamental to learning process to millennials students, limited network and Internet access seem to be perceived challenges affecting their information seeking for academic purposes. This circumstance can be well comprehended as Internet becomes the principal source and gateway for diverse electronic and web information resources to support learning and research activities for academic purposes (El-Maamiry, 2017; Shamila, 2013). In consequence, the effect of Internet access failure is rather clear-cut that students believe their ability to find, retrieve and utilise information is disrupted and having to fall into such situation can be assumed a real setback for the whole process involved, where 30.5% claim they still lacking of information seeking skills i.e information literacy skills. Meanwhile, there is no assured linkage between being proficient computer users and being skillful and well-behaved information seekers among students. This is relevant considering the finding by El-Maamiry (2017) asserting that early exposure to Internet during the elementary stage of learning and being highly confident in their ability to use technology have caused students in having poor information seeking behaviour and techniques. Suprisingly, on the role of librarian and library, fewer number of respondents relate their information

seeking obstacles with unwillingness to approach the reference desk and librarians, which is due to that students tend to use web environment for their information seeking process instead of using the physical library services. El-Maamiry (2017) indicates that the library staff factor does not contribute to students' barrier in relation to information seeking and behaviour. Only 4% of the participating students in his study share the perception that lack of qualified staff is an issue. Instead, from the current study, many students underline unfamiliarity with the library mission is hindering them in carrying out the information seeking process. The finding automatically hints that having a clearer picture of the library roles and functions is important to the students, especially to meet their web environment or virtual space services demand in the library. In fact, this is what the information literacy classes aim to provide, thus it gives an additional clue for the library to promote their user education programmes more assertively. Therefore, as emphasized by the respondents themselves about the need to attend the information literacy programmes, the classes organised by the academic library will be fruitful for students to gain skills and competencies, particularly relating to the technological, cognitive and ethical facets of information seeking processes (Calvani *et al*, 2009). Furthermore, another significant issue in this study is concerned with information ethics. In this aspect of information seeking process fortunately, students seem to possess good awareness as they are certain in their ability to access and use information responsibly, ethically and legally very much aligned with the privacy and intellectual property laws. Besides, in this study the respondents are also given the opportunities to put forth the suggested aspects of library services, resources, facilities, roles and competencies central to their information seeking and behaviour, as provided in the Table 4.

Table 4: Suggestions

Categories	Descriptions
Library network and Internet access	<ul style="list-style-type: none"> • Provision of upgraded, high-speed and stable network and internet connections (including wi-fi) to enhance students' capacity to find information, anytime, anywhere

Library facilities and services	<ul style="list-style-type: none"> • Enhanced computers and facilities provided within the library compound • Centralised, friendly and easy-to-use library systems and databases enabling a wide range of information to be sought by students in line with the needs of different courses
Roles of Libraries and librarians	<ul style="list-style-type: none"> • Libraries need to increase students' awareness on information services and educate them to search for and understand what they need • Librarians should be more friendly, approachable, cooperative and able to explain and guide students in finding the right information from the right sources, quickly and accurately
Skills of students on information seeking process	<ul style="list-style-type: none"> • Students must identify their information needs and plan how to search for information from appropriate channels, search engines and trusted sources • Students should learn information literacy to acquire information seeking skills and to use online databases and library systems accordingly
Information ethics	<ul style="list-style-type: none"> • Regarding information use with safety aspect at hand, students agree with the need to rely on trusted (authoritative) sources and manage risks of copying others' works by quoting, citing and rephrasing sentences to be used in their own works
Library's information sources and collections	<ul style="list-style-type: none"> • Acquisition of current, relevant, authentic and unlimited information for reference purposes, consisting of an increase number of books, other collections and digital or online resources that fit academic needs and other genres

CONCLUSION

In conclusion, research into the information seeking processes is crucial to identify the information seeking behaviour among higher education students especially majority of them known as millenials generation. As millenials generation, their information seeking behaviour so much rely

on web environment in order to complete their assignment. Students are empowered to design and control learning by themselves, therefore it is crucial to highlight the need for the lecturer and librarian to meet student's enthusiasm of learning experience and offer guidance to set proper strategies if the approach is to be really advantageous for student's benefit. Libraries need to increase students' awareness on information services and educate them to search for and understand what they need. As technology become an integral fundamental for millennials students, programme such as digital information literacy should be compulsory to all higher education students in order for them to seek and manage information ethically, and responsibility participate in the digital world for their learning experience.

ACKNOWLEDGEMENT

This paper was supported by Universiti Teknologi Mara, Malaysia. (UiTM). 600-IRMI/DANA 5/3/ARAS (0147/2016).

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STUDENTS' MOTIVATION LEVEL IN GAMIFICATION OF ACCOUNTING TEACHING AND LEARNING – A CASE OF 'ACCOUNTING ON THE BLOCK'

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Received: 16 Oktober 2019

Accepted: 24 January 2020

Online First: 28 February 2020

ABSTRACT

Learning accounting can be very challenging for most students. Students are not only expected to demonstrate a proficiency in accounting process, they must also demonstrate a depth of knowledge and understanding of accounting concepts and fundamentals. In most accounting courses, educators depend on the textbook or power point slides to give lectures and illustrate all the workings on the black/whiteboard while students are listening passively or busy taking notes. Lack of attraction and engagement in the conventional way of accounting teaching and learning may lead to difficulty in understanding basic accounting concepts and overall accounting process, thereby demotivating students to learn accounting. Alternatively, gamification of teaching and learning may provide a useful technique to enhance students' engagement and motivation. For this reason, the authors have proposed a gamification technique, known as 'Accounting on the Block' (AOTB), which is an accounting board game to teach Published Financial Statements for accounting students at diploma level. While numerous studies have been conducted to evaluate students' motivation level in digital game-based learning, there are relatively few studies that address students' motivation level when using physical games,



such as board games. To shed light in this area, a case study was conducted on 50 accounting students who were experimented with the AOTB board game. The Instructional Materials Motivation Survey (IMMS) instrument was applied to measure students' motivation level. The results revealed that most students' motivation levels were positive and they were satisfied with the use of AOTB board game in their learning. However, students also expected improvements in some aspects of the game.

Keywords: *accounting, gamification, instructional materials motivation survey, published financial statements*

INTRODUCTION

Accounting subjects have long been taught using conventional methods (Jaijairam, 2012). While the business environment is vigorous and keeps on changing, teaching and learning accounting remain unchanged. Changes in accounting are more driven by the changes in accounting standards (Purnamasari & Advensia, 2014). In most classes, educators depend on the textbook or power point slides to give lectures and illustrate all the workings on the black/whiteboard while students are listening passively or busy taking notes. Learning accounting can be very challenging and complicated for students. Students are not only expected to demonstrate a proficiency in recording, reporting and analysing business events, they must also demonstrate a depth of knowledge and understanding of accounting concepts and fundamentals (Moncada & Moncada, 2014). Lack of attraction and engagement in the conventional way of accounting teaching and learning may lead to difficulty in understanding basic accounting concepts and overall accounting process (Jaijairam, 2012), thereby demotivating students to learn accounting. Alternatively, gamification of teaching and learning may provide a useful technique to enhance students' engagement and motivation (Taspinar *et al.*, 2016; Nah *et al.*, 2013). Gamification is defined as 'the practice of using game design elements, game mechanics and game thinking in non-game activities to motivate participants' (Al-Azawi *et al.*, 2016). The application of game elements to non-game settings has been given a widespread attention to increase students' engagement and motivation in the classroom.

In this study, we proposed a gamification technique, known as 'Accounting on the Block' (AOTB), which is an accounting board game to teach Published Financial Statements for accounting students at diploma level. While numerous studies have been conducted to evaluate students' motivation level in digital gamification of learning, there are relatively few studies that address students' motivation level when using physical games, such as board games.

Physical games differ from digital games in certain aspects. According to Liu and Chen (2013) digital game offers animated graphics, audio effects and immersive stimulation that a physical game cannot offer. In addition, digital games contain common game mechanics such as leaderboards, badges and competition mechanics that are not usually provided by physical games (Hanus & Fox, 2015). On the other hand, in a classroom setting, the use of physical games could enhance direct interpersonal interaction between educators and students as well as among students to a level that is incomparable to the sound and audio effects of digital games (Liu & Chen, 2013). The board game designed in this study was used to teach Published Financial Statements for diploma students undertaking accounting programme. By handling and moving the cards themselves, students can compete and cooperate with one another through direct verbal communication while at the same time having fun during the process of learning. This situation is expected to result in higher motivation level among students in learning accounting subject.

We believed that it is important to understand students' motivation level in a gamification setting so that the educators can later adopt the necessary measures to enhance students' learning process. With the aim of filling the gap in students' motivation level in a physical game setting, we conducted a survey on students' motivation level and analysed students' motivational needs.

The purpose of this study is to assess students motivation level in a physical game setting, identify whether different student groups would have different motivation levels and propose some recommendations on enhancing motivational features for an accounting board game. The research questions of this study are:

- 1) What are students' motivation level when the AOTB board game is used in teaching and learning Published Financial Statements?
- 2) Is there any difference in motivation levels among different student groups?

LITERATURE REVIEW

Motivation is defined as 'a theoretical construct used to explain the initiation, direction, intensity, persistence and quality of behaviour' (Maehr & Meyer, 1997). Motivation plays a crucial role that stimulates and sustains students' learning behaviour (Tohidi & Jabbari, 2012; Keller, 1987). When focusing on the types of motivation, the literature often distinguishes between intrinsic and extrinsic motivation (Buckley & Doyle, 2016; Hanus & Fox, 2015; Tohidi & Jabbari, 2012). Intrinsic motivation refers to the motivation that is driven by internal rewards and arises within the individual because of the interest or enjoyment in the task itself (Lepper, 1988; Tohidi & Jabbari, 2012). Conversely, extrinsic motivation refers to the behaviour that is driven by external factors such as money, grades and threat of punishment (Buckley & Doyle, 2016).

The ARCS model that encompasses the components of attention, relevance, confidence, and satisfaction (Keller, 1987), has been broadly applied to improve learning motivation in instructional designs (Liu & Chu, 2010). ARCS model represents a motivational design structure, which incorporates 'how many of what kinds of motivational strategies to use, and how to design them into a lesson or course' (Keller, 1987). According to Keller (1987), the model is developed based on four different components: the first is obtaining and sustaining learners' attention, the second is the relevance of the material with learners' past experience or academic requirements, the third is the learners' confidence to accomplish the learning goals and the fourth focuses on learners' satisfactory feeling in relation to their effort. Keller (1987) asserts that if the first three components are met, learners' overall satisfaction will be improved accordingly. The Instructional Materials Motivation Survey (IMMS) was designed to assess whether the instructional material is consistent with the above-mentioned components and examine students' motivation level.

In the research field of digital gamification, Kaneko *et al.* (2018) reported a comparison of experiential learning using game-based educational material and non-experiential learning using e-learning-based educational material. From the perspective of learning motivation based on the ARCS model, they discovered a significant difference in attention, relevance, and satisfaction. Their results indicate that the scores of the game-based material in attention, relevance and satisfaction were significantly higher than those of e-learning. However, they found no significant difference between the game and e-learning in confidence scores.

When comparing a simulation and video game in accounting education, Carens *et al.* (2016) demonstrated that participants generally feel more satisfaction and engagement when playing the video game compared to the simulation. They were also more interested about the topic when playing the video game. Pertaining to confidence, they felt that the rules of the video game were easier to follow than those of the simulation.

Woo (2014) explored the effectiveness an online game known as 'Operating a Small Factory in Computer-Aided Manufacturing' to support learning motivation using ARCS model. The students' responses indicate that the highest mean (6.37) was of the relevance subscale and the lowest mean (5.77) was of the attention subscale. The means of the confidence and satisfaction subscales were 5.90 and 6.05 respectively. The mean of overall learning motivation was 6.02, implying that the game stimulated learners' learning motivation. He also concluded that even though certain game characteristics can attract learners' attention, such as fun, fantasy and curiosity, they are not necessarily relevant to learning.

To assess the effectiveness of digital games in learning mathematics, Hung *et al.* (2014) discovered that the students in the gamified learning group displayed significantly higher learning motivation when compared to those in the traditional instruction group. Based on the experimental results and the students' interview feedback, they concluded that the use of digital games was able to attract students' attention and engage them in learning mathematics. This could be the reason why the students in the gamified learning group outperformed others in mathematics significantly.

In contrast, Hanus and Fox (2015) found that some common mechanics used in the gamified course, such as leaderboards, badges and competition mechanics could harm students' motivation. Students in the gamified course showed less motivation overtime and in turn earned lower exam scores than those in the non-gamified course. Their results imply that some concern should be taken into account when employing certain gamification mechanics in education.

DATA AND METHODOLOGY

To evaluate students motivation level in a physical game setting, the AOTB board game was experimented in a financial accounting course, namely, Financial Accounting 2 (FAR160) offered at Universiti Teknologi MARA, Pahang branch. The experiment was conducted for two weeks during class hours (three hours per week) during the academic session of March to July 2018. The participants consisted of 51 students who were in their second semester of Diploma in Accountancy programme.

Before the game activity began, the students were first introduced with the main concepts of AOTB board game. The board game used is an advanced level and specially design to facilitate students to learn the topic of Published Financial Statements, that is the last topic taught in FAR160 course. The board game comprises the template and items of published financial statements' in the form of small cards. The items are colour coded to imply the double-entry rule to be used in the preparation of the financial statements. The yellow colour represents 'debit' and pink colour stands for 'credit'. Then, the students were split into groups of four or five students. Each group was guided by a facilitator who was in charge of monitoring the group's activities. The facilitators consisted of the researchers and students who were previously trained by the researchers.

Each student in the group had to take turn to construct the published financial statements by placing the cards on the template appropriately. The hilarious penalty cards were also provided to create elements of fun in the game. Any students who failed to arrange the card correctly were

given penalties. The penalties were also intended to encourage students competing with each other and educate them to learn from their mistakes. The mistakes were corrected immediately and learned by other students in the group as well. The winner of the game is the one who obtained the least number of penalties at the end of the game.

After a two-week period, students were given a test on the published financial statements to assess their understanding on the topic learnt through the board game. In addition, the modified IMMS were also distributed to all 51 students. However, only 50 questionnaires were returned. We used the IMMS questionnaires derived from the ARCS model (Keller, 1987). The IMMS consists of 36 questions and four subscales. The four subscales are attention (12 items), relevance (nine items), confidence (nine items) and satisfaction (six items). The students were required to rate all items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). There are ten reverse items in the IMMS instruments (e.g. item 8 of the attention subscale). For the reverse items, the lower score the students give to the reverse item represents higher students' motivational score. The scores of the reverse items should be manually reversed when using this instrument.

To accommodate the gamification setting, some expressions and words were changed in the IMMS questionnaires. The first part contained some general demographic questions, such as gender and previous semester's Grade Point Average (GPA). In the second part, the 36 IMMS survey questions were raised. The third part comprised one open-ended question for students to make further comments and recommendations.

A scale reliability test was performed to evaluate the IMMS result. Subsequently, some basic statistics about motivation level were analysed. An independent t-test and an ANOVA test were conducted to examine whether there was any difference in different student groups' motivation levels.

RESULTS

Scale reliability

The overall reliability of all the scales on standardised Cronbach Alpha was 0.94 ($n = 50$ on 36 items), hence the instrument is appropriate for use in this study (Field, 2009; Hair, 2006). See Table 1 for the tabulated information.

Table 1: Reliability of the IMMS Result

Scale	Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items	N
Attention	0.83	0.84	12	50
Relevance	0.82	0.82	9	50
Confidence	0.76	0.77	9	50
Satisfaction	0.89	0.90	6	50
Total Scale	0.94	0.94	36	50

Students' motivation level

Among all of the 50 respondents, the minimum overall motivation level was 2.11, while the maximum overall motivation level was 4.92. The mean overall motivation level score was 3.63, which was rather positive. Around nine (18%) of the 50 respondents had high motivation level, 26 (52%) had upper-moderate motivation level, 11 (22%) had moderate motivation level and 4 (8%) had low motivation level. The result demonstrated that students were mostly satisfied with the game, with 18% of the respondents had high motivation level and 52% had upper-moderate motivation level. There were also differences among students' motivation level, as the minimum mean score for overall satisfaction was 2.11 and the maximum mean score was 4.92. See Table 2 and Table 3 for the tabulated information.

Table 2: Motivation Level Scores (N = 50)

Item	Minimum	Maximum	Mean
Attention (12 items)	1.58	5	3.68
Relevance (nine items)	2	5	3.81
Confidence (nine items)	1.67	4.67	3.14
Satisfaction (six items)	2	5	3.97
Overall (36 items)	2.11	4.92	3.63

Table 3: Range of Motivation Level

Motivation Level	Scores	Total N=50	Percentage
High level	4.00 – 5.00	9	18%
Upper-moderate level	3.50 – 3.99	26	52%
Moderate level	3.00 – 3.49	11	22%
Low level	<3.00	4	8%

Comparison of different student groups' motivation level

Table 4 shows the demographic data of 50 respondents of this study. There were 16 male and 34 female respondents who were in their second semester of Diploma in Accountancy programme. Among them, 19 respondents had previous semester's Grade Point Averages (GPAs) of 3.50 – 4.00, 16 respondents had previous GPAs of 3.00 – 3.49 and 15 respondents had previous GPAs below 3.00.

Table 4: Demographic Data and Test Scores

Characteristics	Respondents	Percentage
Males	16	32%
Females	34	68%
Previous GPA		
3.50 – 4.00	19	38%
3.00 – 3.49	16	32%
<3.00	15	30%
Test Scores		
90 – 100 marks	20	40%
80 – 89 marks	16	32%
< 80 marks	14	28%

To determine if there was any difference in the motivation levels among different student groups, a comparison on different gender groups’ motivation level was conducted. An independent *t*-test was conducted to compare motivation levels of the male group (N = 16) and female group (N = 34). The result showed that there was no significant difference in scores for the two groups ($p = 0.85$, two-tailed).

An ANOVA test was performed to compare the motivation levels of three student groups based on their previous semester’s GPAs. The students were divided into three groups: Group 1 consisted of students with previous GPAs from 3.50 – 4.00 (N = 19), Group 2 consisted of those with previous GPAs from 3.00 – 3.49 (N = 16) and Group 3 consisted of those with GPAs below 3 (N = 15). The result showed that there was no significant difference among the three groups ($p = 0.29$).

The ANOVA test was also conducted to identify whether there was any difference in the motivation levels among three student groups based on their test scores. The students were divided into three groups: Group 1 consisted of students with the test scores from 90 to 100 marks (N = 20), Group 2 comprised those with the test scores from 80 to 89 marks (N = 16) and Group 3 consisted of those who scored below 80 marks (N = 14). The result revealed no significant difference among the three groups ($p = 0.85$).

Furthermore, a comparison of students' motivational scores for each single item of IMMS was performed. According to the ANOVA test results, there were significant differences on the scores of item 1 'It is clear to me that the content of the game is related to things I already know' of the relevance dimension. There were significant differences at the $p < 0.05$ level for the three groups divided according to their test scores. The results indicated that the mean score for group '90 – 100 marks' ($M = 3.85$, $SD = 0.81$) was significantly different from group '< 80 marks' ($M = 3.14$, $SD = 0.87$). The mean score for group '80 – 89 marks' ($M = 3.88$, $SD = 0.81$) was also significantly different from group '< 80 marks' ($M = 3.14$, $SD = 0.87$). The mean score for group '90 – 100 marks' did not differ significantly from group '80 – 89 marks'. The results suggested that the students who scored below 80 marks thought the game was less relevant to what they already knew or learned before. This could be the reason that hinders them from getting higher test results.

Further analysis of students' motivation level

In this section, students' motivation level was analysed based on four subscales, namely attention, relevance, confidence and satisfaction. As above-mentioned, each scale has some reverse items. For the reverse items, the lower score represents higher students' motivational score. To make it easier to interpret, we have reversed the score manually. See Table 5 for the tabulated information.

In the attention subscale, the total mean score was 3.68 and the highest score was item 2 ($M = 4.16$) and the lowest score was item 4 ($M = 2.80$). According to the results, students mostly thought that the game was eye-catching ($M = 4.16$). However, the game was not able to keep students' attention as the content was so abstract ($M = 2.80$).

In the relevance subscale, the total mean score was 3.81. The highest score was item 7 ($M = 4.02$) and the lowest score was item 8 ($M = 3.38$). The results suggested that students thought the game was quite relevant to their interest or needs.

In the confidence subscale, the total mean score was 3.14. The highest score was item 9 ($M = 3.72$) and the lowest score was item 4 ($M = 2.46$).

It indicated that even though students might not be quite confident when playing the game as it had so much information, but the good organisation of the game helped them to grow their confidence positively.

In the satisfaction subscale, the total mean score was 3.97. The highest score was item 5 ($M = 4.24$) and the lowest score was item 3 ($M = 3.70$). It showed that the students were overall satisfied with the game and their feeling of satisfaction would be very high if they could complete the whole game successfully.

Table 5: Students' Motivation Level from Four Dimensions

Attention	Mean
Q1. There was something interesting at the beginning of the game that got my attention.	3.94
Q2. The design of the game is eye-catching.	4.16
Q3. The quality of writing in the game helped to hold my attention.	3.96
Q4. The content of the game is so abstract that it was hard to keep my attention on it. (Reverse)	2.80
Q5. The design of the game looks dry and unappealing. (Reverse)	3.54
Q6. The way the information is arranged in the game helped keep my attention.	3.76
Q7. The game has things that stimulated my curiosity.	3.70
Q8. The amount of repetition in the game caused me to get bored sometimes. (Reverse)	3.24
Q9. I learned some things that were surprising or unexpected with the game.	3.94
Q10. The variety of reading passages, activities, illustration, etc., helped keep my attention on the game.	3.74
Q11. The style of writing in the game is boring. (Reverse)	3.76
Q12. There are so many words used in the game that is irritating. (Reverse)	3.66
Relevance	Mean
Q1. It is clear to me how the content of the game is related to things I already know.	3.66

Q2. There were examples that showed me how the game could be important to some people in the learning setting.	3.96
Q3. Completing activities in the game successfully was important to me.	3.96
Q4. The content of the game is relevant to my interests.	3.68
Q5. There are explanations or examples of how people use the knowledge in the game.	3.84
Q6. The content and style of writing in the game convey the impression that its content is worth knowing.	3.80
Q7. The game was not relevant to my needs because I already knew most of it. (Reverse)	4.02
Q8. I could relate the content of the game to things I have seen, done, or thought about in my own life.	3.38
Q9. The content in the gamewill be useful to me.	3.96
Confidence	Mean
Q1. When I first looked at the game, I had the impression that it would be easy for me.	2.98
Q2. The game was more difficult to understand than I would like for it to be. (Reverse)	2.52
Q3. After knowing the introductory information, I felt confident that I knew what I was supposed to learn from the game.	3.64
Q4. The game had so much information that it was hard to pick out and remember the important points. (Reverse)	2.46
Q5. As I worked on the game, I was confident that I could learn the content.	3.58
Q6. The activities in the game were too difficult. (Reverse)	3.36
Q7. After working on the game for a while, I was confident that I would be able to pass a test on the content.	3.26
Q8. I could not really understand quite a bit of the material in the game. (Reverse)	2.74
Q9. The good organisation of the content in the game helped me be confident that I would learn this material.	3.72
Satisfaction	Mean
Q1. Completing the exercises in the game gave me a satisfying feeling of accomplishment.	4.08
Q2. I enjoyed the game so much that I would like to know more about this topic.	3.82

Q3. I really enjoyed learning with the game.	3.70
Q4. The wording of feedback after the exercises, or of other comments in the game, helped me feel rewarded for my effort.	3.78
Q5. It felt good to successfully complete the game.	4.24
Q6. It was a pleasure to work on such a well-designed game.	4.22

DISCUSSION AND CONCLUSION

Based on the responses from 50 students, their average motivation level was 3.63. The positive motivation levels revealed that average students were satisfied with the AOTB board game. Item 5 of the satisfaction dimension ‘it felt good to successfully complete the game’ achieved the highest mean score of 4.24. This indicated that average students would feel highly satisfied if they could successfully complete the game. However, item 4 of confidence dimension ‘the game had so much information that it was hard to pick out and remember the important points’ received the lowest mean score of 2.46. Moreover, it cannot be disregarded that item 2 of confidence dimension ‘the game was more difficult to understand than I would like for it to be’ obtained the second lowest mean score. This implied that students felt less confident to learn about the published financial statements through this game since it had too much information and difficult to understand. Due to the complexity of this topic, it might be a huge challenge for the authors to provide uncomplicated or minimal information for this game. As mentioned above, the game was designed to meet the requirements of Financial Accounting 2 (FAR160) course where students were required to prepare a full set of published financial statements.

It is suggested that the board game is developed in a few sets based on different levels of difficulty. For example, set 1 is for low level of difficulty, set 2 is for moderate level and set 3 is for high level of difficulty. Extra items or information can be added as the level of difficulty increases. The facilitators may also consider presenting a demonstration of the game in order to show how the game is worked out. The demonstration of the game may help the students to understand the game better.

According to the independent *t*-test result, there was no significant difference among male and female groups' motivation level. Regarding the ANOVA test results, there was also no significant difference in the motivation level among different student groups divided based on their previous GPA and test scores. When a comparison of students' motivational scores for each single item of IMMS was performed, the ANOVA test results indicated significant differences on the scores of item 1 'It is clear to me that the content of the game is related to things I already know' of the relevance dimension among the three groups of students divided according to their test scores. The results suggested that the students who scored below 80 marks found the game was less relevant to what they already knew, compared to the students who scored higher marks. This might be the factor that hinders them from getting higher test scores.

The practical implication drawn from this study is that accounting educators can find support for adopting a gamification technique in delivering their courses. Accounting educators considering this technique may find guidance from this study regarding what they may expect from the use of physical games, such as board games as a supplementary teaching tool. Particularly, educators delivering accounting courses may find the inclusion of board games useful in enhancing students' learning motivation and coping with students who are diverse in terms of their gender, prior academic achievement and motivation.

Despite these contributions, this study has some limitations. The generalisability of the results is subject to a small sample size. Hence, future studies with a larger scale of investigations could be conducted. In addition, this study has focussed on investigating the differences in the motivation levels among different student groups according to their gender, prior academic achievement and test results. However, it is reasonable to suggest that other variables such as students' learning styles and personalities are also likely to have significant effects on students' motivation in a gamification setting.

ACKNOWLEDGEMENT

This work was supported in part by IRMI under Grant Nos. 600-IRMI/DANA 5/3/ARAS (0158/2016), 600-IRMI/DANA 5/3/ARAS (0041/2016).

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STUDY ON GREEN ENERGY CONVERTER FOR THE PURPOSE OF OPTIMISING TEACHING AND LEARNING IN ENERGY SCIENCE

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Received: 30 December 2019

Accepted: 24 January 2020

Online First: 14 February 2020

ABSTRACT

Knowledge of energy conservation is vital to be understood by students in grasping the topic of energy science. Hence, a study has been piloted to produce energy converter which can be used practically by the students to understand about the conversion of energy from kinetic energy to electricity. In the conversion of kinetic energy to electrical energy, as these energy undergo conversion, the kinetic energy are stored in two forms of storage apparatus. The first type is synchronous flywheels which operate within the allowable range of the synchronous frequency. The second type is asynchronous flywheels whose rotational speed is independent from the system synchronous frequency and varied over a wide range and this feature gives the asynchronous flywheel the ability to store and release significant amount of kinetic energy. The outcomes from this study displayed successful performance which is dynamo that act as generator for the converter as energy is being converted from the kinetic energy into the electrical energy and efficaciously can be used to charge electrical gadget.

Keywords: *kinetic energy, electrical energy, green converter*



INTRODUCTION

The science lesson should be fun. However, the trend shows that students become uncompetitive when studying science and many studies show that students are more likely to break away from tasks when considered too difficult (Fong, Zaleski, & Leach, 2015; Moneta & Csikszentmihalyi, 1996). There are many past researches that have investigated the consequences of task difficulties by manipulating the difficulty of a task (Fulmer & Frijters, 2011). More surprisingly, the evidence provided confirms that the retreat was a critical predictor of academic struggles during adolescence surprisingly little about how the daily experience of the students in the classroom was strongly affecting the shift in class resignation (Balfanz, Herzog, & Mac Iver, 2007).

The topic of energy conversion is one of the fundamental topics for students to understand. The basics of this topic are important as it will be expanded to other topics such as thermodynamics, circular movements and many other advanced topics in science (Kreith & Goswami, 2004). The energy conversion concept is applied to many electrical and electronic tools such as chemical energy to electricity in the creation of batteries, potential energy to kinetic energy and then to electric energy used in the concept of hydroelectric dam and many more use of energy conversion concepts in the creation of everyday tools (Xu *et al.*, 2018).

Energy is defined as the ability to cause change in work (Halliday & Resnick, 2015). Energy is divided into five segments. Some forms of energy are identified including kinetic, potential, mechanical, internal and radiant (Young & Freedman, 2007). In the conversion of kinetic energy to electricity, since this energy is undergoing conversion, kinetic energy is stored in two forms of storage devices. The first type is the synchronous mounting wheel that operates within the allowed range of synchronous frequencies. The second type is an asynchronous flywheel whose rotational speed is independent of the frequency of the synchronous system and varies over the range and this feature gives the wheel the ability to store and generate a large amount of kinetic energy.

Green Energy Converter has been created for energy storage applications that undergo inertia-based devices such as blade wheels.

Flywheels are kinetic energy storage devices where kinetic energy is stored in a rotating mass such as a bicycle. Electrical energy is transmitted from bicycles to frequency field variables. Energy exchange controls occur via an alternating current (AC) converter. It makes direct conversion of kinetic energy to electricity with very high efficiency and the amount of energy that can be stored in the device. The kinetic energy produced in bicycles is then converted into electricity with the help of a dynamo that functions as a generator in converting the two energies.

The universal charger is a battery charger that can be used across multiple electronic devices. The old type of charger is large and heavy which makes it difficult for users to carry it. New mobile chargers develop technology in recent years. It's usually the size of the pocket, the light charger that keeps people away from the electric grid facility by providing instant power anywhere to repeat their tools.

Mobile chargers mean they can be easily ported or moved. Gadgets use a large amount of power, it requires connection to an external power source or an electronic device equipped with a power source. Therefore, the charger is a requirement for everyone, especially the mobile charger. Green Energy Converter chargers can be used during exercise (especially cycling) and during emergencies such as electricity (blackouts). One method for harvesting renewable energy is converting excessive kinetic energy into electricity by using kinetic energy conversion system. Conversion is done through the energy flow of a dynamo that functions as a generator for energy conversion to the circuit. Whatever moves have kinetic energy (Khaligh, Zeng, & Zheng, 2010), the kinetic energy imposed on this product is the 'Kinetic Energy of the Rotation' whose object moves with a turn like a bicycle tyre. The rotating kinetic energy output device consists of rotation components and magnetic generating components. The spin component includes the spin body and the rotating body has axis. The axis is separated by pivot on the housing component, the rotating body has at least one magnetic element. Electricity is the energy provided by the electric charge flow through the conductor.

METHODOLOGY

The process of all the methods have been summarised in Figure 1 while Figure 2 shows the schematic diagram of the circuits involved. All electronic components are mounted on the straight board based on the Printed Circuit Board (PCB) diagram as shown in Figure 3. The inner legs of the pointed out electronic components at the other side of the board were soldered systematically starting with the smaller electronic components to larger ones. The melted soldered copper fixing the position of the electronic components were made sure to not exceeding the given soldering area so the outcome will not be affected. Dynamo is placed on the bicycle seat with the rotating spin button touching the rear tire. The small cable suspended on the connector is connected to the generator or dynamo that has been fully mounted to the rear wheels and all meter readings are recorded.

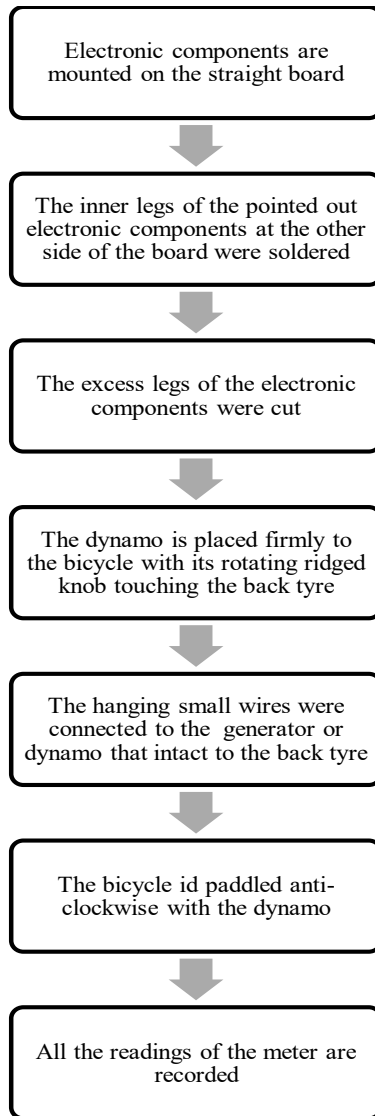


Figure 1: The Flowchart of the Process Being Done to Convert Mechanical Energy to Electrical Energy

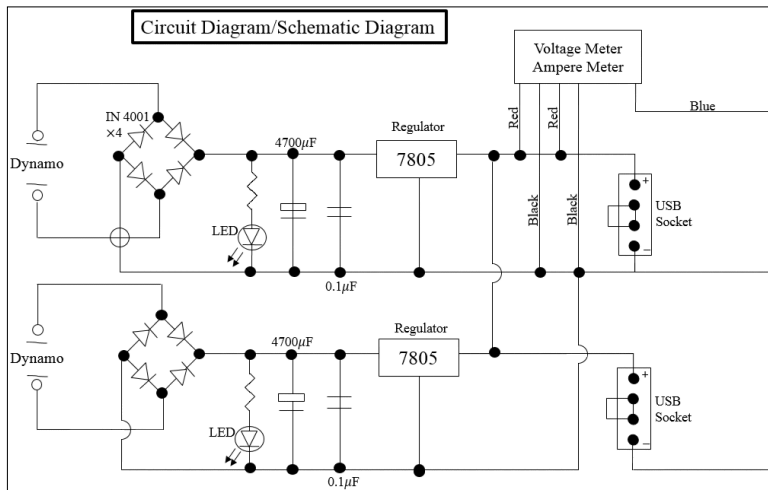


Figure 2: Schematic Diagram

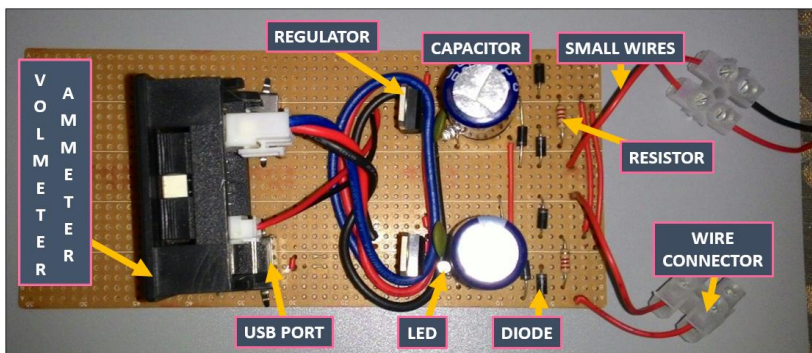


Figure 3: Diagram of the Circuit

DATA ANALYSIS

For an object rotating about an axis, every point on the object has the same angular velocity. The tangential velocity of any point is proportional to its distance from the axis of rotation. Angular velocity has the unit rad/s. Angular velocity is the rate of change of angular displacement and can be described by the relationship.

$$\omega = 2\pi f \quad (1)$$

$$\omega_{\text{average}} = \frac{\Delta\theta}{\Delta t} \quad (2)$$

Table 1: Average Cycle for Minimum Voltage (4.2V) and Maximum Voltage (5.3V)

Trial	Cycles for V_{\min}	Cycles for V_{\max}
1	27	32
2	26	36
3	28	34
Average	27	35

Table 1 shows the minimum and maximum voltages obtained from the trials. It can be stated that the minimum average voltage output was 27 V and the maximum average voltage obtained was 35 V. In general, the kinetic energy of the rotating object is the same as the linear kinetic energy and can be expressed in terms of moment of inertia and angular velocity. The overall kinetic energy of the extended object can be expressed as the kinetic energy of the hub centre translation and the kinetic energy of the rotation of the mass centre. For a fixed rotation axis given, rotational kinetic energy can be expressed in the form of:

$$K_E(\text{linear}) = \frac{1}{2}mv^2 \dots\dots\dots(1)$$

$$K_E(\text{rotational}) = \frac{1}{2}I\omega^2 \dots\dots\dots(2)$$

$$K_E(\text{rotational}) = \frac{1}{2}(mr^2)\omega^2 \dots\dots\dots(3)$$

The expressions for rotational and linear kinetic energy can be developed in a parallel manner from the work-energy principle. Consider the following parallel between a constant torque exerted on a flywheel with moment of inertia I and a constant force exerted on a mass m, both starting from rest. As the data related to this experiment collected below are achieved, calculations regarding rotational motion and the rotational kinetic energy can be performed.

Table 2: Time Taken for the Battery Voltage to Increase to 1% (s) from 0%

Types of Smartphone	Time Taken for the Battery Voltage to Increase to 1% (s)
ASUS (ZENFONE 5)	138
ACER (Z410)	127
SAMSUNG (S4)	165
Average	143

Table 2 exhibits the time taken for the battery voltages to increase to 1% from zero. Three types of smartphones have been utilised in this studies namely Asus (Zenfone 5), Acer (Z410) and Samsung (S4). The results showed that the average time taken for the battery to increase to 1% was 143 seconds (~2 min 23 s).

The green energy converter attached to the bike can be used in most areas but as soon as the device fully charged by this product is affected by many variables, especially cyclical speed. The higher the cycle speed, the higher the power supply to the green mobile charger. However, regulators are included in the circuit to maintain the amount of electricity supply to the USB port so that it does not exceed 5V. Regulators play an important role in preventing from overheating and explosion.

However, if a bicycle is too slow, an unexpected charge may occur because based on our observations on our attempts, to make the green energy converter functionality, it requires at least 4.2V electricity at 4km / h. The green mobile charger gives the same voltage as a 5V (normal) charger for small gadgets like cell phones, mp3s and iPods. In terms of charging periods, when we compare between universal chargers (with USB ports and cables) and green mobile chargers, both have the same period of battery fully charged batteries (small-time battery charging time from 0% to 100% battery usually ranging from 3 to 4 hours as both provide the same amount of electricity if the bicycle operator maintains the cycle speed to produce 5V.

The green energy converter not only being a good model in teaching and learning process by increasing the understanding about energy conversion but it also provide wide range of usefulness as it give many benefits such as conserving of energy, easy to use and can be made at a low cost budget and also easy to carry around. Green energy converter also can be used during exercising (specifically cycling) and during emergency circumstances such as blackout. As user cycling a bicycle, the unused kinetic energy are converted into electrical energy. The conversion was done through the flow of energy from the dynamo which act as the generator for the conversion of energy to the circuit. A brief survey questionnaire shown in Figure 4 has been conducted to the students and the resounding responds (100%) stated that they understand better the conversion of energy by using the green energy converter.

Name:
Age:
Gender:

QUESTION:

*Tick (/) in the box

	YES	NO
1) Do you enjoy cycling?	<input type="checkbox"/>	<input type="checkbox"/>
2) Does your gadget (phone, tab, etc) out of battery frequently?	<input type="checkbox"/>	<input type="checkbox"/>
3) Would you like to conserve energy instead of being waste?	<input type="checkbox"/>	<input type="checkbox"/>
4) Do you think that green energy converter is a necessity?	<input type="checkbox"/>	<input type="checkbox"/>
5) Do you understand better the energy conversion by using the green energy converter?	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4: The Survey Questionnaire That Has Being Conducted to the Students

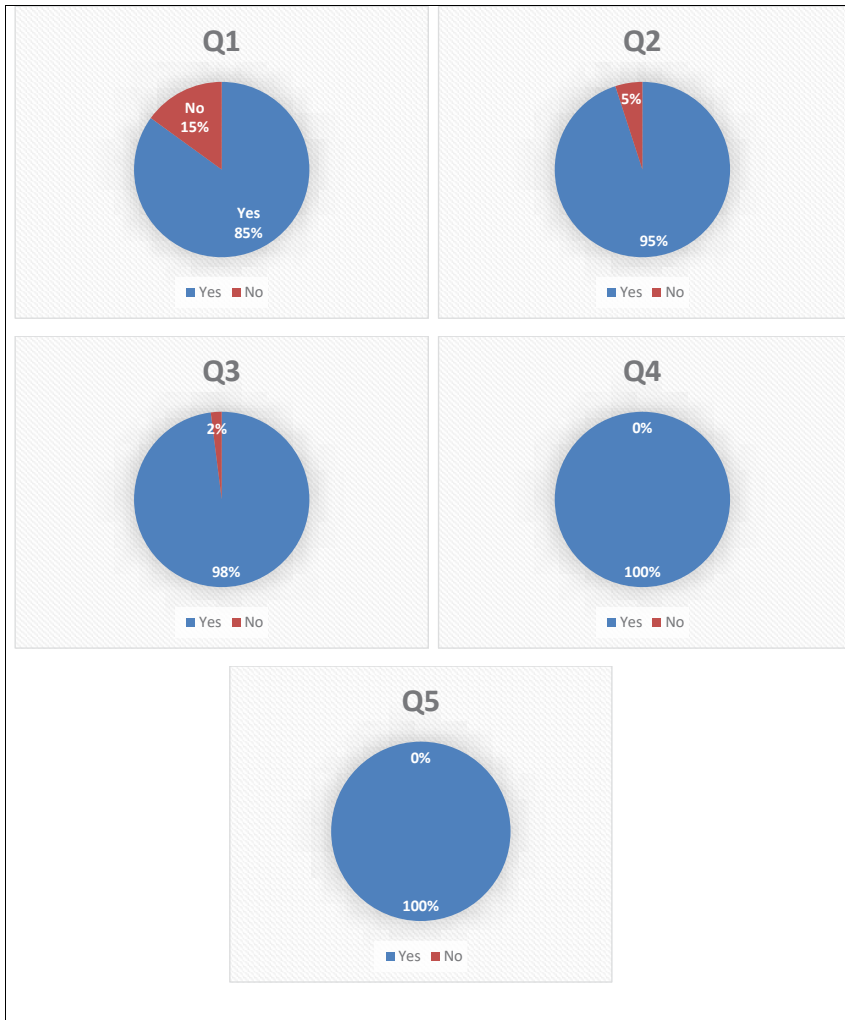


Figure 5: The Outcomes from the Survey Questionnaire, Question 1 (Q1) Till Question 5 (Q5)

CONCLUSION

Topics in science studies on energy conversion can be clearly demonstrated to students through the use of Green Energy Converter. The kinetic energy generated from bicycle pedal will generate electric potential (voltage) that can be seen and measured when charging the gadgets such as smartphones, tablets and other electronic devices. Additionally, this energy conversion tool can also be optimised for the benefit of users. For further research, this Green Energy Converter can also be further expanded so that it can be widely used for optimising teaching and learning in energy-related fields.

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EFFECTS OF GENDER ON LEADERSHIP, ENTREPRENEURIAL ORIENTATION AND ORGANISATIONAL PERFORMANCE

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Received: 16 Oktober 2019

Accepted: 24 January 2020

Online First: 28 February 2020

ABSTRACT

There are two streams of literature regarding relationship between gender and various organisational outcomes and variables affecting performance. Some scholars have found that there are significant differences between males and females regarding their leadership behaviours, entrepreneurial orientation and how organisations perform. Thus, the focus, development and assistance provided to male and female entrepreneurs are different. However, findings also indicated that there is no significant difference between genders. In this study, data were taken from 395 respondents representing either the owners or top managers of various SMEs organisations operating within the manufacturing and services sector in Malaysia. Within the context of SMEs in Malaysia, the result failed to recognise any significant differences between male and female respondents with regards to their leadership behaviours, entrepreneurial orientation and organisational performance. Male and female owners and top managers of SMEs in Malaysia were perceived to be the same in their leadership orientation, entrepreneurial approach and outcomes for organisations. The novelty of this research lies in its attempt to explore gender differences of leaders of SMEs in Malaysia.



Keywords: *gender, leadership behaviours, entrepreneurial orientation, organisational performance, SMEs, Malaysia.*

INTRODUCTION

Mars vs. Venus? The debate based on gender can instantaneously attract attention. Statistics explain that gender parity has nearly been equalised in the areas of education achievement and share of workforce (Schuh *et al.*, 2014). But some researchers still found that the role of women holding leadership positions are still under-represented (Joy, 2008).

With many efforts from the Malaysian government and related entrepreneurial development agencies to encourage more participation from women entrepreneurs, their numbers are now increasing and significant to the entrepreneurial development in the country. Thus, to sustain the performance of SMEs in Malaysia, the country requires contribution from both male and female entrepreneurs. But research on gender related studies especially in Malaysian SMEs is still minimal.

This study is important especially for sustaining entrepreneurial development in the country. Many studies have established that entrepreneurial orientation and leadership are important predictors for performance of SMEs (Arham *et al.*, 2015). The outcomes of this study may indicate if there are any significant difference between male and female entrepreneurs towards the selected variables being studied. The findings of the study may add to the gender-based study in leadership and entrepreneurship literature.

LITERATURE REVIEW

Studies about gender and leadership did not present a conclusive result. Many researchers have established that different leadership behaviours are being practiced between male and female (Eagly, 2013; Eagly & Carli, 2003; Kim & Shim, 2003; Grant, 1988). Males are reported to practice transactional, autocratic, structural and business-focus leadership behaviour, whereas females are claimed to be transformational, participative, considerate,

and people-oriented leaders (Appelbaum *et al.*, 2003; Merchant, 2012). Druskat (1994) indicated that female leaders significantly possess higher transformational qualities than their counterparts, and male leaders are portrayed as having significant transactional behaviours than female leaders.

Eagly and Carli (2003) conducted a meta-analysis of 45 studies comparing leadership behaviours between male and female managers. They concluded that females tend to significantly display more of transformational leadership attributes and also contingent reward behaviour than male leaders. On the other hand, management-by-exception (transactional leadership attribute) and laissez-faire leadership are attributes that are highly associated with male than female leaders.

A study examining gender differences toward EO was conducted by Recio *et al.* (2014). The analysis of the mean differences indicated that there are significant differences in entrepreneurial behaviours due to gender differences. It indicates that male and female respond differently towards their entrepreneurial approach.

With regards to performance, some researchers claimed that female leaders might have an edge over male leaders. Females scored higher on every component of leadership efficacy and workplace satisfaction (Smith & Smits, 1994; Eagly & Carli, 2003). These studies suggested that women may, in fact, be better suited than men to managerial roles.

- Based on the above literature, the following hypotheses were proposed:
- H1 : There is a significant difference in the leadership behaviour scores for male and female entrepreneurs.
 - H2 : There is a significant difference in the entrepreneurial orientation scores for male and female entrepreneurs.
 - H3 : There is a significant difference in the organisational performance scores for male and female entrepreneurs.

METHODOLOGY

This study adopted a quantitative approach. There were two approaches used to collect the data. First, SME Corporation Malaysia was contacted to obtain permission to access into their database. Based from the database, 1000 potential respondents were randomly selected from the manufacturing and services industry. Invitation e-mails, reminder e-mails and follow-up telephone calls were made to encourage participation from potential respondents. Due to anticipation that there would be a low response rate from potential respondents via this recruitment strategy, a second approach was initiated. Several agencies that conduct and organise training and seminars for leaders of SMEs were contacted and some of them agreed to assist with the distribution and collection of the survey questionnaire. Thus, additional 700 questionnaires were also distributed through those agencies registered under SME Corporation Malaysia.

The targeted respondents were owners or top managers of SMEs establishments. It is assumed that they are the best candidates who understand the economic performance and strategic direction of their organisations.

For the questionnaire design, there were four sections in the questionnaire. The first section covered questions relating to the demographic characteristics of respondents. The second section covered questions relating to the leadership orientation of respondents. The instruments used were adopted from Bass and Avolio (2004).

The third section covered questions relating to entrepreneurial orientation of respondents. The instruments used were adopted from Covin and Slevin (1989) and Wang (2008). The final section covered questions relating to organisational performance and the items were adopted from Matzler *et al.* (2008). Except for items in the first section of the questionnaire, all items were measured on a 5-point Likert scales ranging from strongly disagree (0) to strongly agree (4).

Of 1700 questionnaires distributed through online and self-distribution, 395 data were finalised for data analysis representing a 23% response rate. Only respondents operating within the manufacturing and

services industry were involved since these industries have had the most contribution towards economic development in the country (National SME Development Council, 2011).

RESULT

The Cronbach's alpha coefficients for all three variables were above 0.70. This indicated an acceptable measure of internal reliability for all variables (Nunnally, 1978; Pallant, 2011).

Descriptive Analysis

Data were analysed based on 395 valid questionnaires. A total of 52.2% of the respondents were from the manufacturing industry. Owners represented 45.8% of the sample and the remaining were top managers. In terms of gender distribution, there were 62.5% male respondents. Malay represented 84.3% of the sample population.

t-Test Analysis

An independent samples *t*-test was conducted to compare the mean between male and female respondents towards studied variables. If there is any significant difference, effect size will be calculated. Effect size measures if the statistical differences found is truly sufficient and not by chance. Eta squared is one common measure of effect size. Cohen (1998) guidelines on how to interpret the strength is followed.

Table 1: *t*-Test Analysis

	Mean Scores		T-value	Significant
	Male	Female		
Transactional leadership	2.94	2.85	1.78	0.076
Transactional leadership	2.35	2.29	1.49	0.138
EO	2.62	2.59	0.64	0.523

Organisational performance	2.64	2.64	-0.02	0.986
N (395)	247	148		

Note: Rating Scale: 0-4

Based from the above table, male respondents scored higher in both forms of leadership behaviours and EO than female respondents. Based on Table 1, the respondents perceived that they are practising more of transformational leadership than transactional leadership. Results also indicated that there was no statistical difference in the mean scores of leadership, EO and performance between male and female respondents. Thus, all three hypotheses were not accepted.

Further analyses were tested to examine if there is any significant difference in the mean scores between male and female respondents towards each individual dimension for transformational and transactional leadership and EO. The results are as follows.

Table 2: Gender vs Transformational Leadership (N=395)

	Mean M	Mean F	T-value	Significant
Idealised influence	2.91	2.83	1.5	0.115
Intellectual stimulation	3.14	3.04	1.51	0.132
Inspirational motivation	2.85	2.79	0.83	0.406
Individualised consideration	2.74	2.68	0.92	0.316

Note: Rating Scale: 0-4

Table 3: t-Test: Gender vs Transactional Leadership (N=395)

	Mean M	Mean F	T-value	Significant	Effect Size η^2
Contingent reward	2.97	2.81	2.33	0.021	0.003
Management-by-exception (active)	2.75	2.76	-0.2	0.845	
Management-by-exception (active)	2.75	2.76	-0.28	0.783	

Note: Rating Scale: 0-4

Table 4: t-Test: Gender vs EO (N=395)

	Mean M	Mean F	T-value	Significant	Effect Size η^2
Innovativeness	2.81	2.81	0.09	0.926	
Proactiveness	2.56	2.41	2.28	0.023	0.013
Risk-taking	2.45	2.52	-0.87	0.383	

Note: Rating Scale: 0-4

Based from additional analyses conducted, there is no statistical difference found in the means scores of transformational leadership dimensions for male and female respondents (refer Table 2). The results only found statistical significant difference in the mean scores between males and females respondents for one dimension of transactional leadership (contingent reward) and one dimension of EO (proactiveness). The magnitude of the difference in the mean score for contingent reward is considered as very small whereas the magnitude of the difference in the mean score for proactiveness is considered as small to medium.

DISCUSSION

Results based on Table 1 indicated that gender is not a factor of leadership effectiveness. Additional analyses on transformational leadership (Table 2.0) revealed that there is no statistical significance difference in the mean scores

for any of the dimensions between male and female leaders. With regards to transactional leadership, there is some statistical significant difference in the mean scores among the gender for contingent reward dimension, with a very small effect size.

The same results were obtained for the remaining two variables, EO and organisational performance. Gender is not a factor for entrepreneurial action and organisational effectiveness within the context of SMEs in the country. However, at the dimension level of EO, results indicated that there is a significant difference in the mean proactiveness scores between male and female leaders (refer Table 4.0). Thus, male leaders perceived themselves to be significantly more proactive than female leaders did.

The findings of gender and leadership behaviours in this study seem to support findings from Anderson *et al.* (2006), Morgan (2004) and Kent *et al.* (2010) found there is no difference in the self-reported outcomes between men and women leaders. It shows that within the context of SMEs is Malaysia, neither a male nor female entrepreneur is better than the other.

With regards to EO, the findings concur with that of Bertoneclj and Kovac (2009). Based on a study of 183 Slovene top and middle managers, they found that there are no gender differences towards capturing opportunities, taking risks and innovating. For organisational performance, Watson (2003) also indicated that within the context of Australian SMEs, performance of organisation was not being influenced by gender.

CONCLUSION

Thus, the outcome of this study concludes that gender is not a factor towards leadership orientation of leaders, gender is not a factor of entrepreneurial action and gender is not related to organisational effectiveness.

In the context of Malaysian SMEs, female entrepreneurs tend to express similar perceptions to the main variables in this study. This can be due to more women holding managerial positions. Besides, the mean scores between the two groups were quite close between male and female leaders.

Finally, this study would like to highlight that, interestingly, female leaders of SMEs in Malaysia perceived themselves to be risk-takers, more than the male leaders. Even though it does not indicate any significant difference in the mean scores, it shows that female entrepreneurs in Malaysia are willing to take risks. Perhaps with support from the relevant agencies, this perception could be transformed and utilised into more promising entrepreneurial ventures by females in the future.

In addition, this study attempts to fill the gap in the literature with regards to gender related studies among SMEs leaders in Malaysia. To sustain the development of SMEs in Malaysia, SME leaders need to be more resilient to global challenges. For women entrepreneurs, they should not be intimidated to compete against their male counterparts. The results of this study indicated that neither men nor women are better in any of the studied variables. Perhaps leadership effectiveness is dependent upon various group structures and organisational environments (Foels *et al.*, 2000). As Riggio (2008) suggested that effectiveness of a leader depends on the interaction between leader's behaviour and the situation. However, more training needs to be given for women entrepreneurs to build up their confidence, skills and knowledge about running businesses and entrepreneurship.

This study is not without limitations. First of all, this study represents only a snapshot of the variables at one particular time. Perhaps, a longitudinal study may eliminate this shortcoming. The use of self-reported measures may be biased and perhaps the use of multiple respondents from different individuals may reduce this. Employees may perceive leaders differently and thus a comparative study is recommended and might further enhance the contribution towards gender related literature.

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MULTITASKING AND JOB SATISFACTION AMONGST SECONDARY SCHOOL TEACHERS AT THE DISTRICT OF KLANG, SELANGOR MALAYSIA

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Received: 16 October 2019

Accepted: 24 January 2020

Online First: 28 February 2020

ABSTRACT

The role of a teacher has always been challenging especially in the 21st century. Ranging from teaching, extra-curricular activities, sports, administrative, to non-academic matters, teachers teaching in the secondary schools tend to multitask their daily duties. Added with numerous responsibilities in the digital era, doing just one thing at a time seems to be very luxury yet awfully wasteful. Indeed, multitasking was considered essential in today's work efficiency. Based on observation and empirical studies, multitasking tends to influence and contribute to teachers' job satisfaction. Nonetheless, there are also gaps in the existing local literature pertaining to multitasking and job satisfaction amongst teachers in the Malaysian local school context. In view of this, the current study is conducted with the primary aim to investigate the relationship between multitasking and job satisfaction amongst the secondary school teachers in one of the districts of Klang, Selangor, Malaysia. A descriptive correlational research design using a mixed-methods approach was employed to explore the relationship between the two variables. Two instruments measuring multitasking by Woods, Boyd, Rand, Nardo and Boyd (2014) and Job Satisfaction survey by Spector (1997) were adapted to suit the local setting



for data responded by 124 secondary school teachers. The quantitative findings revealed that there were significant, positive and moderate relationships between multitasking and job satisfaction. However, findings from the multiple regression indicated that only 11.3% of the variance in job satisfaction was contributed by multitasking. In addition, qualitative data tend to triangulate the quantitative findings. Besides positive responses, there were also voices that proposed otherwise. Consequently, all these findings lead to some important implications in terms of the corpus of knowledge and policy implication related to the two variables of educational management and leadership amongst the teachers cum instructional leaders in the academic setting.

Keywords: *job satisfaction, multitasking, secondary school teachers and instructional leaders*

INTRODUCTION

Multitasking is highly practised by many teachers cum instructional leaders in today's classroom as well as educational setting both at private and public institutions in Malaysia. Ranging from teaching, managing extra-curricular activities, administering both academic and non-academic matters, teachers are found to multitask numerous duties in a day. Added with administrative responsibilities in the digital age, juggling with two or more tasks at a time seems to enhance their job efficiency. Thus, multitasking is considered essential to many teachers whose roles are countless especially when dealing with students. In view of this, the researchers are of the opinion, that multitasking is related to job satisfaction. Based on observation and some literature pointing to the relationship between multitasking and job satisfaction, the researchers embarked on the current study investigating the relationship between multitasking and job satisfaction amongst the secondary school teachers at one of the districts in Klang Selangor, Malaysia.

LITERATURE REVIEW

The recent Minister of Education in Malaysia, Datuk Seri Mahdzir Khalid (2017, *The Malay Mail*) postulated that the rapid digital world has given rise to the notion that teachers will need to face the reality of the robust changes in their duty and roles as educators. He added that the teaching landscape in Malaysia has become very challenging that at one point only those who are willing to equip themselves with various critical skills including multitasking can sustain themselves in the teaching profession. Based on the Malaysia Education Development Plan 2013 – 2025, The Ministry of Education Malaysia, has revitalised teaching profession accordingly. Among the measures, multitasking is preferred due to the pressure of increased efficiency in schools.

In 2013, Sanbonmatsu, Strayer, Medeiros-Ward and Watson have defined multitasking as the concurrent performance of doing two or more functionally independent tasks, with each of the tasks having unique goals. Meanwhile, Woods, Boyd, Rand, Nardo and Boyd (2014) proposed that the definition of multitasking is divided into two general categories. The first definition of multitasking stands for the processes that happen in a person's brain and focuses on the process of working memory. Meanwhile, the second definition of multitasking stands for the actual actions in multitasking involving a dual task performance as well as task switching. However, Ahmad and Alkahtani (2016) proposed a simple definition of multitasking that it refers to the ability and capacity of a person to execute more than one task at a time. All in all, it can be observed that the definitions of multitasking are concerned with both mental processes and the actual action in performing two or more tasks simultaneously yet serving different objectives.

As of today, there are studies conducted to investigate multitasking at the workplace such as recent studies by Brante (2009), Kirchberg, Roe, and Eerde (2015), and Ahmad and Alkahtani (2016). However, among these studies, little was investigated on multitasking at the workplace in the educational settings (Beiler, 2013). Hence, it is necessary to investigate topic on multitasking at workplace amongst teachers since they hold many responsibilities in schools and contribute a lot to a nation's growth and manpower. Besides teaching, teachers need to evaluate assignments/ exams/project papers, managing events, completing academic and non-

academic reports and so on. On top of that, Johanim Johari, Fee Yean Tan and Zati Iwani Tjik Zulkarnain, (2018) asserted that at times teachers are also expected to work during holidays to ensure that educational-related activities could be planned and implemented smoothly as in the coming school sessions. In short, teachers do not only serve as educators to transmit and disseminate knowledge, but concurrently they hold various roles such as a manager, planner, facilitator, and exemplary to the community.

Based on the teachers' workload mentioned above, it could be observed that multitasking could somehow enable teachers to achieve academic and non-academic goals as well as to enhance their job efficiency. However, not much was investigated whether multitasking is correlated and contributed to job satisfaction. Hence, past research revealed that job satisfaction is an essential variable that leads to better work performance and organisational effectiveness.

Neininger, Lehmann-Willenbrock, Kauffeld and Henschel (2010) stated that organisational performance can only be obtained if members are fully committed to achieve its organisational goals. In order for schools to achieve its organisational goals, teachers in schools need to be fully committed and highly functioned. However, while it is important for the teachers to be committed, the school administrators must also be aware of their teachers' needs and job satisfaction level. This is because job satisfaction will somehow affect the schools' growth and success. Further, when teachers can obtain their needs and wants, these will lead to positive emotional response towards their job situation, which is also called job satisfaction by numerous scholars such as Amzat and Idris (2012); Gurinder and Gursharan (2010).

In 1996, Baughman claimed that extrinsic factors surrounding the job such as salary, school safety, fringe benefits, support from the school administrators and job security would have a significant relationship on job satisfaction amongst teachers in schools. However, recent doctoral local research by Amzat (2011) stated otherwise. His research findings on intrinsic factors such as motivation and high management skills and leadership styles contributed to the high level of job satisfaction which mediated the high level of organisational performance and success. The study also suggested that if teachers were able to attain an adequate freedom, autonomy, and job

satisfaction, they would be in a position to fulfil educational objectives and national goals. Hence, based on the literature presented, it is now justified to conceptualise and measure the statistical relationship between multitasking (as one of the management skills and the independent variable) and job satisfaction (dependent variable) amongst teachers in Malaysian secondary school context.

PROBLEM STATEMENT

The study on the statistical relationship between multitasking and job satisfaction amongst teachers is rarely discussed and researched among academic scholars. However, it is an endless topic to be debated but only a few numbers of theses and theories have been developed to describe multitasking and job satisfaction in the education context. Thus, there are a few problems identified concerning the variables.

Firstly, teachers perform various teaching and learning tasks such as being the class teacher, head of subject panels, advisors to the school clubs and various social projects. Accordingly, being a teacher itself is already demanding. For example, the class teacher is required to do various clerical work such as filling the students' forms and report cards in detail to ensure that students' data is completed and saved in the school digital system for various purposes. With all these demanding tasks, the quality of the teacher's teaching might be affected and indirectly, the quality of education, in general, may be compromised. Sharifah, Suhaida and Soaib (2014) pointed out that the heavy workload and multitasking contributed to occupational stress amongst the teachers in school.

Sharifah, Suhaida and Soaib (2014) mentioned that before the school semester begins, teachers are normally required to work during the holidays to ensure educational planning for the upcoming sessions are running smoothly. Apart from this, teachers also need to prepare the teaching materials and at the same time mastering the contents of subjects taught to be imparted to the students. Therefore, teachers need to juggle with various tasks and eventually practise multitasking to enhance job efficiency. Since there are a lot of things to be done, teachers need to multitask to ensure the teaching and learning objectives are to be achieved. Hence, teachers

usually need to be in the class at least 20 minutes before the teaching and learning process starts.

Secondly, with various tasks to perform, teachers do not only serve as educators to impart knowledge, but also as managers, planners, facilitators and role models to the students. All these roles and tasks to perform might cause the teachers to eventually lose focus in their ultimate task, which is teaching the students in the classroom (Ministry of Education, 2007). Consequently, the heavy workload will have a toll on the teachers' morale, job satisfaction and eventually, the quality of the teachers' personal lives (Sharifah, Suhaida, & Soaib, 2014; Bridges & Searle, 2011). Teachers who work under pressure would commonly perform low at school and eventually scored low in many areas such as work quality, dedication, motivation, creativity, commitment, work skills and moral ethics. Hence, all these would also affect their job satisfaction and work performance. Besides that, it is compulsory for the teachers to attend school meetings and participate in various programmes and events such as camping, canteen day, sports day and many others which eventually result in an overload of work for them (Stoddard & Kuhn, 2008). Further, Leithwood (2006) reported that teachers' organisational commitment had reduced because they were overworked, and it affected their job satisfaction negatively. Realistically, teachers suffer when they have so much to attend to. Teacher's turnover and their job satisfaction would create teachers shortage issue (Ingersoll & Smith, 2003) and it might compromise the education quality. The lower their job satisfaction level, the less effective teachers would be at school and in the end, it might result in the students' low achievement in education (Rinke, 2008).

Lastly, Wong and Heng (2009) stated that as of today there is scarcity of research concerning the variable focusing on multitasking amongst teachers. In view of this, little has been conducted regarding the statistical relationship between multitasking and job satisfaction among teachers in Malaysian educational setting too. Therefore, this study intends to explore the statistical relationship between multitasking and job satisfaction amongst secondary school teachers in one of the districts of Klang, Selangor, Malaysia.

METHODOLOGY

A descriptive correlational research design using a mixed-methods approach was employed to explore the relationship between multitasking and job satisfaction variables amongst the secondary school teachers in one of the districts of Klang, Selangor, Malaysia. Two instruments measuring Multitasking by Woods and Whitney (2014) and Job Satisfaction survey by Spector (1997) were adapted to suit the local setting for data collection amongst 179 secondary school teachers in one of the districts of Klang, Selangor, Malaysia (total population). Few open-ended questions were also included with the aim to triangulate and validate the quantitative data. Questionnaires were sent via the drop-off survey method where it allows the respondents to answer the survey at their own convenience. Out of these 179 teachers, 70% ($n=124$) completed and returned the questionnaires. Statistical Package for Social Science (SPSS) Version 22 was used to analyse the quantitative findings. In addition, the qualitative data were coded and categorised in accordance to the quantitative dimensions with the aim to triangulate the overall quantitative findings.

To assist the interpretation of quantitative data, finding on the interval six-point Likert Scale of multitasking and job satisfaction was collapsed into three categories such as low, moderate and high levels of multitasking and job satisfaction. For both variables, data which were rated as “1 = Strongly Disagree, 2 = Moderately Disagree” with the mean score of 1.00 to 2.99 were collapsed as low level of multitasking and job satisfaction, while data which were rated as “3 = Slightly Disagree, 4 = Slightly Agree” with the mean score of 3.00 to 4.00 were collapsed as moderate level of multitasking and job satisfaction. Whereas data which were collapsed as “5 = Moderately Agree and 6 = Strongly Agree” with the mean score of 4.01 to 6.00 were collapsed as high level of multitasking and job satisfaction. Pearson Product Moment Correlation Coefficient test analysis was employed to measure the statistical relationship between the two variables. It was conducted to investigate whether there was any significant relationship between multitasking (independent variable) and job satisfaction (dependent variable) variable. To determine the degree of strength or magnitude of the relationship in the current study, Cohen’s rule of thumb (1988) was referred. The Pearson Coefficient (r) value ranges from 0.5 to 1.00 is interpreted as strong relationship. This is followed by a moderate (0.30 – 0.49) and weak relationship (0.10 – 0.29).

RESULTS AND DISCUSSION

Findings from demographic data is presented in term of gender, age, and race. Table 1 illustrates the demographic profile of the study.

Table 1: Demographic Profile of the Respondents (Frequency and Percentage)

Gender	Frequency (n)	Percentage (%)
Male	30	24.2
Female	94	75.8
Age (years old)	Frequency (n)	Percentage (%)
25 and below	15	12.1
26 – 35	38	30.6
36 – 45	40	32.3
46 – 55	28	22.6
56 and above	3	2.4
Race	Frequency (n)	Percentage (%)
Malay	105	84.7
China	6	4.8
India	10	8.1
Others	3	2.4
Total	124	100.0

There were 30 (24.2%) male and 94 (75.8%) female respondents involved in this study. 15 (12.1%) out of the total respondents aged 25 years old and below, 38 (30.6%) were between 26 to 35 years old, 40 (32.3%) were between 36 to 45 years old, 28 (22.6%) were between 46 to 55 years old and 3 (2.4%) were between 56 years old and above. In addition, 105 (84.7%) respondents were Malays, 10 (8.1%) of were Indians, 6 (4.8%) were Chinese and 3 (2.4%) were from other races.

Research Question 1

What is the mean score of multitasking level amongst the secondary teachers in one of the districts of Klang Selangor, Malaysia?

Data from both quantitative and qualitative methods were collected, analysed and presented as the followings. Mean scores and standard deviations of items were analysed accordingly amongst the secondary teachers in one of the districts of Klang Selangor, Malaysia. A total of 12 items divided into two dimensions of multitasking; the ability and preference to multitask dimensions, with six-point Likert scale were used to measure the level of multitasking amongst the secondary school teachers. Table 2 illustrates the mean scores of overall and dimensions in multitasking amongst the secondary teachers in one of the districts of Klang, Selangor, Malaysia (M=3.90, SD=.78), indicating a moderate level of multitasking practices. This result can also be interpreted that the overall, the respondents were slightly agreed upon multitasking. In addition, Table 2 illustrates the mean scores and standard deviations of the two dimensions in multitasking; ability and preference. The mean scores for both dimensions ranged between 3.58 to 4.22. The highest mean score was reported on ability to multitask dimension (M=4.22, SD=.85), implying that the respondents rated high level of multitasking or rated slightly agreed on the ability to multitask. Meanwhile, the lowest mean score between the two dimensions was reported from preference to multitask dimension (M=3.58, SD=.92) implying the respondents rated moderate level of multitasking or rated slightly disagreed to almost slightly agreed on the preference to multitask dimension.

Table 2: Mean Scores of Multitasking Dimensions

Dimensions	N	Mean	SD	Level
Dimension 1: Ability to Multitask	124	4.22	.85	High
Dimension 2: Preference to Multitask	124	3.58	.92	Moderate
Overall Mean Score	124	3.90	.78	

1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Moderately Agree and 6 = Strongly Agree

Research Question 2

What is the mean score of job satisfaction level amongst the secondary teachers in one of the districts of Klang, Selangor, Malaysia?

Quantitative data were collected and analysed to answer research question 2. Both mean scores and standard deviations were analysed to interpret the findings on job satisfaction level amongst the teachers. A total of 34 items with six-point Likert scale were used to rate all nine dimensions of job satisfaction level amongst the teachers. All the nine dimensions of job satisfaction were: salary, supervision, contingent reward, operating condition, communications, promotion, fringe benefit, co-workers and nature of work.

Table 3 illustrates those teachers rated high level of job satisfaction in all nine dimensions with mean scores ranging from 4.28 to 5.12. The highest mean score was obtained from nature of work dimension (M=5.12, SD=.84) indicating that the respondents rated high level of job satisfaction. This is followed by communication (M=5.06, SD=.85) and contingent reward (M=4.76, SD=.91) dimensions. Meanwhile, the lowest mean score dimension was obtained from operating condition dimension (M=4.28, SD=.82). Even though it was the lowest mean score rated amongst the nine dimensions in Job Satisfaction, the finding was interpreted as slightly agreed which was categorised as high level of job satisfaction.

Table 3: Mean score of Job Satisfaction.

Dimensions	N	Mean	SD
Dimension 1: Salary	124	4.67	0.89
Dimension 2: Promotion	124	4.52	0.86
Dimension 3: Supervision	124	4.57	0.82
Dimension 4: Fringe benefit (extra benefit)	124	4.64	0.95
Dimension 5: Contingent reward	124	4.76	0.91

Dimension 6: Operating condition	124	4.28	0.82
Dimension 7: Co-workers	124	4.50	0.77
Dimension 8: Nature of work	124	5.12	0.84
Dimension 9: Communications	124	5.06	0.85
Overall Total Mean Score	124	4.68	0.67

1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Moderately Agree and 6 = Strongly Agree

Research Question 3

Is there any significant relationship between multitasking and job satisfaction levels amongst the secondary teachers in one of the districts of Klang Selangor, Malaysia?

The Pearson Product Moment Correlation Coefficient was employed to analyse the relationship between multitasking (independent variable) and job satisfaction (dependent variable) amongst the secondary school teachers. Table 4 shows that there was a significant relationship between multitasking and job satisfaction ($r=.336, p=.000$). Based on Cohen (1988), this social-science based relationship is categorised as moderate correlation. Thus, this correlation shows that the higher the multitasking practices, the higher the job satisfaction level amongst the respondents.

Table 4: Correlation between Multitasking and Job Satisfaction

Variables		Job Satisfaction
Multitasking	Pearson Correlation	.336**
	Sig. (2-tailed)	.000
	N	124

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

Further analysis according to two multitasking dimensions was conducted. Table 5 depicts a significant, positive and moderate relationship between the ability to multitask and job satisfaction ($r=.406, p=.000$) and also a significant, positive and low relationship between preference to multitask and job satisfaction level ($r=.190, p=.035$). Hence, findings can be implied that the relationship between ability to multitask and job satisfaction level is higher than preference to multitasking and job satisfaction.

Table 5: Correlation between Multitasking Dimensions and Job Satisfaction

Variables	Job Satisfaction	
Ability to Multitask	Pearson Correlation	.406**
	Sig. (2-tailed)	.000
	N	124
Preference to Multitasking	Pearson Correlation	.190*
	Sig. (2-tailed)	.035
	N	124

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

* . Correlation is significant at the 0.05 level (2-tailed)

Research Question 4

What is the relative contributions of multitasking level as independent variable towards dependent variable of job satisfaction level amongst the secondary teachers in one of the schools of Klang District, Selangor, Malaysia?

Multiple regression of statistical test was employed to measure the relative contributions of multitasking level as the independent variable towards dependent variable of job satisfaction level amongst the respondents. Table 6 shows that a significant equation ($F(1,122)=15.534, p<.000$), with R^2 of .113. The respondents predicted that job satisfaction was equal to $y=3.547(\text{constant})+.291(\text{multitasking})$. This implied that 11.3% ($R^2=.113$)

of the variance in job satisfaction can be predicted from independent variable of multitasking. Thus, it can be inferred that the remaining of 88.7% was due to other factors that were not taken into consideration of this study.

Table 6: Relative Contribution of Multitasking Level towards Job Satisfaction Level

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.336a	.113	.106	.636

a. Predictors: (Constant), Overall Multitasking Mean

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6.280	1	6.280	15.534	.000 ^b
Residual	49.321	122	.404		
Total	55.601	123			

a. Dependent Variable: Job Satisfaction, b. Predictors: (Constant), Multitasking

Coefficients^a

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.
	B	Std. Error	Beta		
1	(Constant)	.294		12.058	.000
	Multitasking	.074	.336	3.941	.000

a. Dependent Variable: Job Satisfaction

Qualitative Findings on the Relationship of Multitasking and Job Satisfaction

Besides the quantitative findings above, qualitative data were also collected from an open-ended question amongst the respondents. The qualitative data were gathered through the following questions: Based on

your teaching/working experiences in this school, is there any relationship between multitasking and job satisfaction? Yes or No? Why is that so, kindly explain?

Qualitative data shows that 92% (N=114) of the respondents responded positively (Yes) that there was a relationship between multitasking and job satisfaction whereas only 8% (N=10) responded negatively (No). Correspondingly, various responses were gathered as to why they responded positively or negatively.

Respondent number 10 mentioned that,

“From my experiences after working more than 10 years in this school, I could feel that more and more teachers nowadays are doing more than one task at a particular time as compared to those days. Multitasking is paramount in the digital age. While teaching, I have to observe my students frequently as to who is/are concentrating on me. Sometimes I have to walk around and check on their workbooks, notebooks or laptop, etc. and went back and fourth to ensure that they align with my teaching. During exam weeks I would juggle with so much admin work, marking and students’ activities too. Sometimes multitasking is carried out subconsciously or automatically that I don’t know how I did it. But of course, my objective is to finish up my never-ending work. Eventually, I feel good and satisfied that I have fulfilled my objectives of the day. Hence, I would agree that there is a relationship between multitasking and job satisfaction.”

Respondent number 27 mentioned that,

“Multitasking is a must if you are a teacher. Just imagine, I have 35 to 40 students per class and multiply with four or five classes. A teacher could easily teach 100 students per day. It is good if I can finish a lot of teaching objectives and admin work daily. But this requires juggling or multitasking for teachers. Personally, once I have fulfilled my tasks for the day, I would feel very satisfied even though I tend to be very tired by the end of the day. All in all, I would say that teachers are considered efficient if they can juggle and multitask their work.”

Interestingly, respondent number 35 stated that,

“I did so much of multitasking at school with few aims in mind... I teach, do admin work, attend meetings and at the same time administering

my students using smartphone – Whasapp; monitoring and communicating with the parents using Whasapp too.....multitasking affects my job satisfaction because the more I could multitask, the faster I could finish my job and concentrate on other things, and above all able to go back early.”

Further, respondent number 48 mentioned that,

“To me multitasking is considered as a talent. Some people are very good when they multitask but on the other hand, some would perform poorly when they multitask too. As for me, multitasking fulfils my job satisfaction. As I am good with technology, I could teach efficiently, multitask with admin work and students related activities. Technology has enabled me to be more efficient with time and juggled with a lot of things. In today’s world, technology has bridged the time and distance gaps. Overall, I do not mind to multitasking since I became more efficient and this definitely increases my job satisfaction in teaching.”

However, there was a respondent who tend to multitask and perform better when working under pressure. Respondent number 56 mentioned that,

“Not everyone can multitask. But I train myself to multitasking since I have pressure to finish my work on time. Dealing with hundreds of students and doing both teaching and admin work require good time management. Thus, I only have 24 hours to finish certain datelines and work-related matters. So far, I learned that I had to multitasking for example, doing A within a few minutes... stop and doing B, and coming back to A and stop again and jumping to C. The most challenging is when I am doing A and B or A and C simultaneously in a short period of time. Sometimes, there is quality to my work but sometimes there isn’t any quality at all. But if I were to work under pressure, multitasking could be the only solution... and amazingly, this contributed to my job satisfaction.”

Besides having a relationship between multitasking and job satisfaction, there were also negative responses from the respondents. For example, respondent number 8 mentioned that,

“There is so much work to be done in a very short period of time, from teaching the students to doing all the admin work. Hence, I cannot ignore things that need to be fulfilled within the stipulated time. Multitasking or doing two or three things concurrently may create a stressful environment to me or some other teachers. Hence, this could create negative relationship with my job satisfaction. And honestly, I am not happy with multitasking.”

Further respondent number 19 said,

“When there is so much work to do, I tend to multitask. I thought I was good in it but it turned up to be the other way round. The more I multitask, the more disorganised I became. In fact, multitasking put more pressure on me. The truth is, I cannot do so many things at a time. I just couldn’t find satisfaction in multitasking as I juggle with a lot of things. Thus, I could not focus in my work... All I need is more time to complete the various tasks given.”

Last, respondent 90 stated that,

“Personally, I couldn’t find any relationship between multitasking and job satisfaction. I tend to multitask only when there is so much work to be done. I have the ability to multitasking but given the choice, I prefer not to. This is because, I may not be able to deliver quality when two or few things were carried out at the same time. At times, I totally forgot that I have to come back to the task number one because I was so engrossed doing task number two. All in all, I would say that I can multitask, I do have the ability to be doing more than one task at a time but given the choices I don’t prefer doing it. Multitasking can be very stressful if one does not able to handle it.”

CONCLUSION

The aim of this study is to investigate the statistical relationship between multitasking and job satisfaction amongst the secondary school teachers at one of the districts in Klang, Selangor, Malaysia. Overall finding revealed that there was a positive, significant and moderate relationship between the two variables. This finding seems to be paralleled to a similar study conducted by Gu (2016) who reported that there was a significant relationship between heavy workload and job satisfaction among school teachers. Further analysing looking at the individual dimensions show that there was a positive and significant relationship between the ability to multitask dimension and job satisfaction ($r=.406, p=.000$). This finding seems to be aligned with a study conducted by Woods *et al.* (2014) that mentioned the ability to multitask at workplace dimension seemed to influence the performance outcome variable, both positively and negatively among respondents. Finally, overall finding from the Multiple Linear

Regression indicated that 11.3% ($R^2=.113$) of the variance in job satisfaction dependent variable was contributed by independent variable of multitasking. As part of the triangulation and validation to the quantitative findings, the qualitative findings were collected, analysed and presented from a simple set of open-ended questions. Majority (92%) of the teachers agreed that there was a relationship between multitasking and job satisfaction. Qualitative findings would suggest that the teachers tend to multitask in many ways for various reasons and these lead to high level of job satisfaction variable. However, about 8% of the teachers rated that there was no relationship between the variables studied since they would become more stressful to juggle and multitask their teaching and work-related matters.

Above all, lack of quality delivery, focus and numerous meeting datelines have given more pressure to multitask amongst the secondary school teachers. Hence, they perceived multitasking negatively instead of fulfilling their job satisfaction. All in all, both quantitative and qualitative data above would raise some implications to the corpus of knowledge related to the two variables of educational management and leadership in academic organisation. While most of the past studies dedicated on the separate variables exclusively, the current study is focusing on the statistical relationship between the two variables; multitasking and job satisfaction amongst the secondary school teachers in Malaysia. It can be observed through findings that multitasking has become an important component of job satisfaction. Therefore, teachers can learn to multitask their routine activities for a meaningful job satisfaction and performance. Lastly, findings could also provide some policy implication to the stakeholder such as the Ministry of Education, and schools administrators such as the headmasters and principals regarding teachers' workload so that they could develop or plan a better way to apply multitasking in teachers' working environment such as job training and development programmes that could enhance the teacher's level of multitasking as well as to improve their job satisfaction.

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