GOOGLE CLASSROOM: PERCEPTION AND ACCEPTANCE OF ONLINE LEARNING AMONG MALAYSIAN SECONDARY SCHOOL TEACHERS

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By

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ABSTRACT

GOOGLE CLASSROOM: PERCEPTION AND ACCEPTANCE OF ONLINE LEARNING AMONG MALAYSIAN SECONDARY SCHOOL TEACHERS

Jacqueline Lau Chung Ling

Throughout the years, teaching methodologies have gradually transformed from traditional methods to technology-based teaching methods. Amongst many available online learning tools, Google Classroom as a Learning Management System has emerged as a popular option for educational purposes. Thus, this study aimed to determine the perception and acceptance of Google Classroom among Malaysian secondary school teachers. The first research objective is (1) to determine the influence of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, and behavioral intention on use behavior of GC among Malaysian secondary school teachers. The second and third research objectives are (2) to explore the benefits and challenges faced by Malaysian secondary school teachers while adopting Google Classroom, and (3) to explore the suggestions given by Malaysian secondary school teachers for the better adoption of Google Classroom. This study took a mixed-methods approach in conducting the study. A total of 406 secondary school teachers from West and East Malaysia participated in the survey, and 31 secondary school teachers participated in the interviews. Overall, four of the 10 proposed hypotheses were supported. Performance expectancy and hedonic motivation significantly influenced the behavioural intention, habit

significantly influenced both behavioral intention and use behavior of Google Classroom among the teachers. The most perceived benefit of Google Classroom is the ease of marking homework and giving feedback. The most prevalent challenge encountered is the students' discipline and attitude problems during online teaching and learning. As for the suggestion, most of them recommended to improve the Internet connection and gadgets. The findings show that Google Classroom is highly applicable in schools amidst the COVID-19 pandemic. The findings of this study will assist stakeholders in understanding the use of Google Classroom in schools and making appropriate judgments about its use among teachers.

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APPROVAL SHEET

This dissertation entitled "**GOOGLE CLASSROOM: PERCEPTION AND ACCEPTANCE OF ONLINE LEARNING AMONG MALAYSIAN SECONDARY SCHOOL TEACHERS**" was prepared by JACQUELINE LAU CHUNG LING and submitted as fulfillment of the requirements for the degree of Master of Philosophy (Social Science) at Universiti Tunku Abdul Rahman.

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I understand that University will upload softcopy of my dissertation in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

Jacqueline
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DECLARATION

I hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

Jacqueline

(JACQUELINE LAU CHUNG LING)

Date: 2nd May 2023

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LIST OF ABBREVIATIONS

AVE	Average variance extracted
BI	Behavioral intention to use
CMCO	Conditional Movement Control Order
CPS	Cyber-Physical Systems
CR	Composite reliability
EE	Effort expectancy
eRAS	Educational Research Application System
ERIC	Education Resource Information Center
F^2	Effect size
FC	Facilitating condition
GAfE	Google Apps for Education
GC	Google Classroom
HM	Hedonic motivation
HT	Habit
HTMT	Heterotrait-monotrait ratio of correlations
LMS	Learning Management System
MCO	Movement Control Order
MoE	Malaysian Ministry of Education
MSC	Malaysian Super Corridor
PE	Performance Expectancy
PLS	Partial Least Squares
PV	Price Value
Q^2	Model's predictive relevance
R^2	Coefficient of determination
RMCO	Recovery Movement Control Order
SEAMEO	Southeast Asia Ministers of Education Organization
SEM	Structural Equation Modelling
SERC	Scientific and Ethical Review Committee
SI	Social influence
SPSS	Statistical Package for Social Science
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
UB	Use behavior
UTAUT 2	Unified Theory of Acceptance and Use of Technology 2
VIF	Variance inflation factor
VLE	Virtual Learning Environment
WOS	Web of Science

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Online spaces shape how and why people learn nowadays, including social networking, sharing of information like photos and videos, microblogging, and also by constructing and disseminating knowledge (Gerber et al., 2016). Due to the ever-changing characteristics of technology, the online spaces are expeditiously emerging and evolving, while expanding in the overall number of users. It is undeniable that the development of the online spaces until the present is closely related to the industrial revolution which has happened since the early 18th century.

According to Bloem et al. (2014), the industrial revolution is viewed as a development and a concept that has constitutionally changed our economy and society. It can be distinguished that there are four stages throughout the ongoing process of the industrial revolution dating from the year 1784. With reference to Bloem et al.'s (2014) and as depicted in Figure 1.1, the first revolution occurred with the mechanical production generated from steam and water. Followed by the second revolution, characterised by the mass production with the introduction of the conveyor belt and electrical energy. Then, the third

revolution is characterised by the digital automation of production with the mechanisms of computers and electronics.

Figure 1.1

Four Stages of the Industrial Revolution
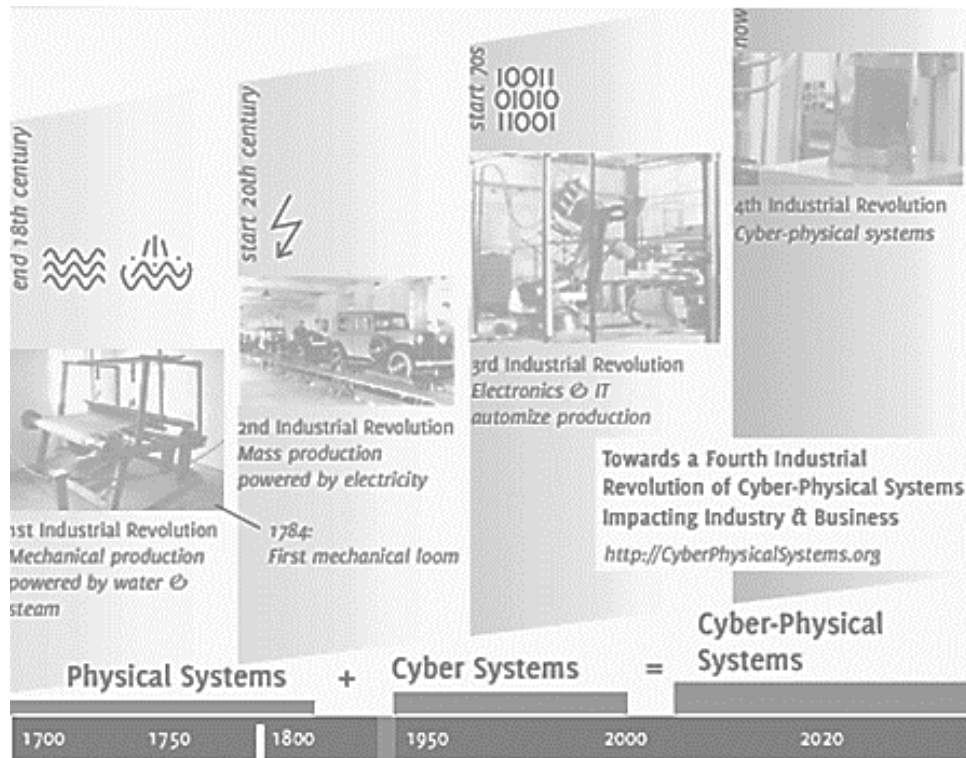
Note. This figure depicts the four stages of industrial revolution. Adapted from "The Fourth Industrial Revolution: Things to Tighten the Link between IT and OT", by J. Bloem et al., 2014 (https://www.sogeti.com/globalassets/global/special/sogeti-things3en.pdf). Copyright 2014 by Sogeti VINT.

Presently, characterised by so-called "Cyber-Physical Systems" (CPS), the world is at the starting point of the fourth stage of industrial development, which is the Industrial Revolution 4.0 or Industry 4.0 (Bloem et al., 2014) and

there is an ongoing formation of intelligent network systems. Just like what Bloem et.al. (2014) mentioned, the people are living in the era of the "enormous Internet acceleration of industry which comes from the explosive growth of digital devices" (p.12). Internet gadgets like tablets, smartphones, video cameras and all kinds of computers have refined the security, quality and efficiency of process operations and productions. It is becoming easier to connect these intelligent gadgets to the Internet, creating a more conducive cyber-physical world for humans to indulge in.

At the same moment, while the cyber-physical world is developing, the concern of ways to prepare the present and future generations to thrive and succeed in this fast-evolving world is a continuing issue among the educators, parents and government. Graham (2017) mentioned that it is unquestionable that education is at the heart of preparing our generations to thrive in the technology world, and it is vital that we have an education that develops humans to be capable in applying knowledge and performing collaborative problem-solving in life.

What stands out in the current spate of a reformation in educational technology is the emphasis on Education 4.0. According to Dunwill (2016), Education 4.0 is clarified as the implementation of technology in the teaching and learning contexts. Throughout the years, the teaching methodologies have slowly evolved from traditional methods to more technology-based teaching methods. This transformation sows the seeds of the blooming of Education 4.0 in most of the present-day curriculum around the world. Education that is based

on facts and procedures, which is Education 1.0 has been reformed in order to generate more active learners and to meet the requirements of knowledge and skills in the future.

In Malaysia, the initial attempt to revamp the curriculum with e-learning was started 23 years ago, which is the introduction of the Smart School Project that included 87 schools nationwide (Malaysian Ministry of Education, 2005). The Ministry of Education subsequently introduced the 1BestariNet project and the Malaysia Education Blueprint 2013-2025 (Malaysian Ministry of Education, 2013) that significantly reforms the education industry until today.

In the chapter "Ministry Transformation" of Malaysian Education Blueprint 2013-2025, it has been mentioned that the goals of developing an array of ICT related policies and plans, including the Smart School Roadmap and the Policy on ICT in Education 2010, are to harness the potential of ICT in intensifying the depth and refining the overall quality of education (Malaysian Ministry of Education, 2013). In this context, there are several renown projects that served as the milestone of elevating e-learning in Malaysia.

As the prominent approach of the 1BestariNet project, the virtual learning environment, Frog VLE has been introduced to the teachers and students in 2011. Shen et al. (2017) stated in their study that, Frog VLE represents the revolution in the Malaysian education industry as it is the first cloud-based learning platform which involves the students, teachers and parents all together in attaining the aspiration of educational goals in Malaysia.

After the termination of the second phase of the 1BestariNet project by the Ministry of Education in 2019, the use of FROG VLE is no longer being encouraged. Instead, the Ministry issued a press statement on the decision of using Google Classroom (GC) as a replacement for FROG VLE (Malaysian Ministry of Education, 2019b), which is said to be more adaptive and uses simple learning methodology. GC is a new tool introduced to the globe in 2014. This form of classroom facilitates the educators to create and organize homework and assignments quickly, provide feedback efficiently, and communicate with their students with ease (Shaharanee et al., 2016).

GC was launched through the Google Apps for Education (GAfE) in 2014, now known as Google Workspace for Education Fundamentals (formerly also known as G Suite in Education), which is at the core of Google's offerings to schools, including features like Gmail, Docs, Drive, Sheets and Talk or Hangouts (Rochelle, 2016). This form of productivity suite is a learning tool that comes with multiple benefits: (1) reducing paperwork, (2) assisting classroom management, (3) promoting student-teacher interaction, (4) stimulating creative thinking, dialogue, and (5) initiating inquiry-process which is a learner-centred approach in teaching that is highly emphasized in today's education (Azhar & Iqbal, 2018; Shaharanee et al., 2016). Amongst many available online learning tools, GC as a Learning Management System (LMS) has toppled over these tools and became the most popular option for various education platforms (Abazi-bexheti et al., 2018; Jakkaew & Hemrungrote, 2017; Kumar & Bervell, 2019).

Since the outbreak of COVID-19 that later spread across the globe causing pandemic, Malaysia has experienced lockdown (also known as Movement Control Order) for the past years and while the condition for lockdown has been revised from time to time according to the situation in the country, all educational institutions remained largely and temporarily closed until further notice is administered by the Ministry. In the time being, online classes have become the dominant mode of teaching, and many educators have resorted to the use of Google Classroom as the main platform to conduct lessons, prominently due to the many benefits offered by Google Classroom itself discussed throughout the chapters.

1.2 Problem Statement

Educational technology has been researched by many scholars since its emergence. Ever since the introduction of e-learning into the Malaysian education industry, it has become a topic of interest among Malaysian researchers and they have been making attempts to adapt educational technology into existing frameworks of traditional classroom teaching and learning (Cheok et al., 2017). Using various research databases available such as Scopus, Web of Science (WOS), and Education Resources Information Center (ERIC), the gaps related to the current situation of educational technology have been identified.

In the context of research related to GC, there is a disparity among the research conducted in different levels of Malaysian educational settings. Recent research within Malaysia in the past decade has explored the use of GC in higher education institutions (Kumar & Bervell, 2019; Shaharanee et al., 2016) and also in primary school setting (Tamin & Mohamad, 2020). However, none of the available literature seems to investigate GC in the setting of Malaysian secondary education yet. The Ministry of Education Malaysia (Malaysian Ministry of Education, 2013) has previously highlighted in the National Education Blueprint that efforts have been made by the Ministry to integrate technology in the Malaysian classrooms but with limited depiction of the use of GC in various educational settings, there remains an uncertainty of how GC has been used in these settings.

Next, the availability of Malaysian research using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) continues to be largely unmapped (Nur et al., 2019; Raman & Don, 2013). Being a prominent theory in investigating technology acceptance, the use of UTAUT2 is well-researched in Malaysian higher education institutions (see Hashim & Zainuddin, 2015; Kuan et al., 2014; Fard et al., 2016; Nur et al., 2019; Nuradilah et al., 2017; Raman & Don, 2013) and the same applies to the international context (see El-Masri & Tarhini, 2017; Garone et al., 2019; Guggemos et al., 2020; Nikolopoulou et al., 2020; Nistor et al., 2014). Evidently, literature on educational technology and its acceptance is especially well-received in the context of higher education settings, both the Malaysian and international contexts, thus resulting in a phenomenon of secondary education setting being neglected.

Following the availability of literature using UTAUT2 being limited to higher educational settings, the purpose of using UTAUT2 is not related to the field of education as majority of the Malaysian studies has been looking in the field of accepting technology from an economic point-of-view (see Hashim & Zainuddin, 2015; Kuan et al., 2014; Fard et al., 2016; Nuradilah et al., 2017). Based on the gaps identified in the literature, the question is now evident: Why is educational technology not explored in Malaysian educational settings further not inclusive of secondary education?

Addressing the question asked previously, with the preventive measure of implementing the Movement Control Order (MCO) by the Malaysian government since the outbreak of the COVID-19 pandemic in 2019 followed by the Conditional Movement Control Order (CMCO) and the Recovery Movement Control Order (RMCO), GC has become one of the main platforms for education to be continued, not only in higher education but also secondary and primary education. Although educators and teachers may not be sufficiently experienced in using GC and other related online teaching platforms to conduct lessons (Leighton, 2012), the happening of the pandemic now forces them to go online since educational technology has been a part of the 21st century teaching and learning. Simply put, it is an obligation now to use educational technology to teach students.

Indeed, the incorporation of educational technology has been positively viewed by many as a mean to open multiple benefits in the teaching and learning

process (Al- Maroof & Al-Emran, 2018; Kumar & Bervell, 2019; Mafa, 2018; Nistor et al., 2014; Shaharanee et al., 2016). Benefits of using educational technology are not a stranger to many: It provides active, interactive, and meaningful learning; replaces traditional pedagogy methods successfully, and enhances effectiveness in classroom teaching and learning (Azidah et al., 2011; Cheok et al., 2017; Hoque et al., 2012; Lau, 2019; Nikian et al., 2013; Raman, 2011). Yet, scholars like Jordan and Duckett (2018), Margaryan et al. (2011), and Dassa and Vaughan (2018) have argued that using online learning platforms may actually offer benefits that are only at the hypothetical level.

Based on the argument made, Margaryan et al. (2011) and Dassa and Vaughan (2018) support their argument by claiming that students' engagement of learning online is actually lower than expected. Although the Malaysian Ministry of Education (2013) has been emphasizing that educational technology plays an important role, the catalyst in aiding and boosting the quality of education in the country, in reality it might not seem to be that way. In fact, Malaysian researchers like Shaharanee et al. (2016) have found that students are criticizing the introduction of GC in classrooms: It is indeed beneficial in conducting lessons but there is a significant lacking of practical aspects where they can actually perform hands-on tasks. The educators are undeniably facing different levels of challenges in integrating their physical lessons into online learning platforms. Hence, their suggestions on improving the situation based on their actual experience are valuable and crucial in order to boost the online teaching and learning experience.

Followed with the termination of FROG VLE and the announcement of GC as the replacement for educational purposes made by MOE (Malaysian Ministry of Education, 2019b), while GC has been perceived positively by the Ministry as capable of enabling teachers to facilitate, create, and organize homework, provide effective feedback, communicate students with ease (Hairom, 2020; Shaharanee et al., 2016), and even make its name into one of the top searches in Internet browsers (Hairom, 2020), it is not definitive yet that GC is indeed well-accepted by Malaysian teachers.

To complicate matters, many studies investigating the use of educational technology only recruit students as their research participants and among these research conducted, majority of them have relied on quantitative methods to inquire the use of educational technology (see Alim et al., 2019; Al-Maarof & Al-Emran, 2018; Dash, 2019; Hashim & Zainuddin, 2015; Heggart & Yoo, 2018; Jakkaew & Humrungrote, 2017; Kuan et al., 2014; Kumar, 2014; Kumar & Bervell, 2019; Mafa, 2018; Nur et al., 2019; Nuradilah et al., 2017; Shaharanee et al., 2016; Wijaya, 2016). Again, the evidence is clear: The sampling method is heavily one-sided as it slants towards students' responses in using educational technology and the research methodology employed have relied heavily on quantitative methods in inquiring the phenomenon.

1.3 Research Objectives

The main objective of this study is to determine the perception and acceptance of Malaysian secondary school teachers on Google Classroom.

Therefore, the acceptance of Google Classroom among the Malaysian secondary school teachers will be examined in terms of performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, and the behavioral intention to use Google Classroom. Besides, this study also aims to explore the benefits and challenges encountered by the Malaysian secondary school teachers and their suggestions on the better adoption of Google Classroom. Hence, the specific objectives of this research are as follows:

1. To determine the influence of performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, and behavioral intention on use behavior of Google Classroom among Malaysian secondary school teachers.

2. To explore the benefits and challenges faced by Malaysian secondary school teachers while adopting Google Classroom.

3. To explore the suggestions given by Malaysian secondary school teachers for the better adoption of Google Classroom.

1.4 Research Questions

This study aims to answer the following research questions:

1. Do performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, and behavioral intention have significant influence on use behavior of Google Classroom among the Malaysian secondary school teachers?

2. What are the benefits and challenges faced by the Malaysian secondary

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school teachers on Google Classroom?

3. What are the suggestions given by the Malaysian secondary school teachers on the better adoption of Google Classroom?

1.5 Hypotheses

Research Objective 1

H1: Performance expectancy will have significant influence on behavioral intention to use GC.

H2: Effort expectancy will have significant influence on behavioral intention to use GC.

H3: Social influence will have significant influence on behavioral intention to use GC.

H4: Facilitating condition will have significant influence on behavioral intention to use GC.

H5: Facilitating condition will have significant influence on use behavior of GC.

H6: Hedonic motivation will have significant influence on behavioral intention to use GC.

H7: Price value will have significant influence on behavioral intention to use GC.

H8: Habit will have significant influence on behavioral intention to use GC.

H9: Habit will have significant influence on use behavior of GC.

H10: Behavioral intention to use GC will have significant influence on use behavior of GC.

1.6 Significance of the Study

Through this research, the perception and acceptance of Malaysian secondary school teachers on the implementation of GC in online learning can be determined. Ever since the sudden termination of FROG VLE and the introduction of GC as a replacement to it (Malaysian Ministry of Education, 2019b), teachers who are transitioning between these two platforms may experience confusion since the functions work differently.

Amidst the COVID-19 pandemic, although there is a huge surge of numbers indicating a high and immense search of GC by educationists for learning (Mokhtar, 2020), it is undoubtable that teachers are experiencing some challenges when using GC in online teaching albeit the benefits available during the use of GC (Sri Priya, 2020). Furthermore, with the pandemic happening across the globe, it is now an opportunity to ensure all educationists will be well-prepared and trained so that lessons would be effectively conducted even amidst the difficult situation people are facing. In the 21st century, both teachers and students must be well-equipped with the skill of technology and since there are also demands from students to be capable of using technology to face their future careers, sufficient preparation from stakeholders would be able to prepare every party to efficiently meet the aspirations of Education 4.0.

As such, with the results obtain from the research, various stakeholders such as MOE can take immediate action to develop appropriate guidelines usage to help teachers shift themselves into using this new online platform for teaching

and learning in virtual classrooms easily; syllabus writers in the Ministry with the findings available would consider them, adapt, revise, and reproduce a better blueprint of e-learning for future generations; in fact, the entire MOE would have a comprehensive and clear picture on the situation of using educational technology during the pandemic and initiate necessary actions to improve the state of learning for the students. Ultimately, all parties regardless of the Ministry, educationists, and students would be able to fully understand the value of using online learning platform, i.e., GC as a way to learn during lessons in pandemic.

In addition to the practical significance that can be obtained through this research, the first clinical significance of conducting this study would definitely enrich the literature of accepting educational technology in Malaysian classrooms. To date, since there is a lack of available, published research on the application of GC in the Malaysian secondary educational settings in addition to the outbreak of COVID-19 pandemic, conducting this study would significantly contribute to the existing literature on using educational technology in the Malaysian classrooms.

Additionally, through employing UTAUT 2, an even deeper insight on the acceptance of educational technology among educators can be obtained. Since educational technology has become gadgets that extend learning from acquiring knowledge to building skills in an interactive learning environment (Abu Mezied, 2016; Xing & Marwala, 2017) and Malaysian teachers have been expressing concerns on implementing technology in classrooms (Cheok et al.,

2017; Ghavifekr et al., 2016; Hoque et al., 2012; Nikian et al., 2013), these concerns and experiences of using educational technology can be answered and acknowledged through the validated and popularly-used UTAUT 2.

Finally, along with the previously validated UTAUT 2, this study does not only include quantitative methods like past studies did (see Alim et al., 2019; Al-Maarof & Al-Emran, 2018; Dash, 2019; Heggart & Yoo, 2018; Jakkaew & Humrungrote, 2017; Kumar & Bervell, 2019; Mafa, 2018; Nur et al., 2019; Nuradilah et al., 2017; Shaharanee et al., 2016) but also qualitative methods in enriching the findings since mixed-methods in research would provide sufficient findings in describing a phenomenon being investigated (Creswell & Guetterman, 2019).

The exposure and usage of the online learning platforms will increase unceasingly not only for students, but also for teachers. Therefore, teacher preparedness and training will be continuously in need to be modified, in order to attain the 21st century educational goals and the aspiration of Education 4.0. The achievement of the research objectives of this study through both quantitative and qualitative means can thus provide novel insights on the perception of the ever-widening educational technologies.

1.7 Definition of Terms

This study adopts the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) developed by Venkatesh et al. (2012) as the

theoretical framework. The following are the definitions of "perception" and "acceptance", followed by the definitions of the variables which will ultimately influence the behavioral intention to use GC among the teachers.

1.7.1 Perception

As defined in the Cambridge Dictionary (n.d.-a, Definition 1), perception is a thought, belief or opinion that is often held by many people. In this study, perception is defined as the perceived benefits and challenges encountered by Malaysian secondary school teachers while adopting GC in online teaching and their suggestions for the improvement on the usage of GC in the future.

1.7.2 Acceptance

As defined in the Cambridge Dictionary (n.d.-b, Definition 6), acceptance is the act of agreeing to something. In this study, the following variables, which are performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, behavioral intention to use and use behavior will be examined to determine the acceptance of GC among Malaysian secondary school teachers.

1.7.2.1 Performance Expectancy

Venkatesh et al. (2003) define performance expectancy (PE) as "the degree to which an individual believes that using the system will help him or her to attain gains in a job performance" (p.447). Venkatesh et al. (2003) also mentioned that PE pertains with the construct of "perceived usefulness" from the Technology Acceptance Model (TAM). It is the strongest predictor of a person's behavioral intention to use a technology. In this study, PE refers to whether a secondary school teacher believes GC can help him or her to improve their job performance.

1.7.2.2 Effort Expectancy

Venkatesh et al. (2003) defined effort expectancy (EE) as "the degree of ease associated with the use of the system" (p.450). In this study, EE refers to the extent to which a secondary school teacher believes using GC will be relatively free of effort and easy to operate.

1.7.2.3 Social Influence

Social influence (SI) is defined by Venkatesh et al. (2003) as "the degree to which an individual perceives that important others believe he or she should use the new system" (p.451). SI is also perceived as a subjective norm in TAM (Venkatesh et al., 2003). Subjective norm is also one of the intention constructs in the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1980). In this

study, it refers to whether the people who are important to the secondary school teachers think they should use GC.

1.7.2.4 Facilitating Condition

According to Teo (2013), facilitating condition (FC) refers to the degree to which an individual believes that an organisational and technical infrastructure exists to support use of technology. In this study, the FC will be the existence of guidance, specialised instructions or technical personnel to help the teachers when it is needed during the use of GC.

1.7.2.5 Hedonic Motivation

Due to the certain gaps that had been found in UTAUT (Venkatesh et al., 2012), hedonic motivation (HM) is one of the prominent constructs that have been integrated into UTAUT to form UTAUT2, in order to tailor it to the context of consumer technology. HM is defined as "the fun or pleasure derived from using a technology" (p.161, Venkatesh et al., 2012), and it has been shown to play an important role in determining technology acceptance and use (Brown & Venkatesh, 2005). In the context of this present study, HM refers to the perceived enjoyment and pleasure among the secondary school teachers while using GC.

1.7.2.6 Price Value

Venkatesh et al. (2012) mentioned that the prominent purpose of integrating price value (PV) into UTAUT to form UTAUT 2 is to address the cost issue of technology use in the consumer setting. Price value has also been extended by Venkatesh et al. (2012) to examine the role of value on the continued adoption of a technology. In this study, PV refers to whether the teachers believe their spending on the use of GC provides a good value.

1.7.2.7 Habit

According to Venkatesh et al. (2012), integrating habit (HT) into UTAUT to form UTAUT 2 will complement the theory's focus on intentionality as the overarching mechanism and key driver of behavior. HT has been defined by Venkatesh et al. (2012) as "the extent to which people tend to perform behaviors automatically because of learning" (p.161). In this study, HT refers to whether the secondary school teachers tend to use GC automatically because of teaching and learning purposes.

1.7.2.8 Behavioral Intention to Use

Behavioral intention to use (BI) is defined as the degree of the likelihood a person will make use of a certain technology or application (Fishbein & Ajzen, 1980), and BI is expected to have a significant positive influence on technology

usage (Venkatesh et al., 2003). In this study, behavioral intention refers to whether the teachers will use GC in the future or do they plan to use GC.

1.7.2.9 Use Behavior

According to Venkatesh et al. (2012), use behavior (UB) is depicted as the actual usage of a technology. In contrast with other variables in UTAUT 2 which their measurement scale is ranging from "strongly disagree" to "strongly agree", the measurement scale for UB is the frequency of using the technology. In this present study, UB refers to the frequency of using GC among the secondary school teachers, ranging from "never" to "always".

1.8 Summary

In brief, Chapter One includes the background of the study which describes how the Industrial Revolution has developed the education system around the world, and also led the reformation of the education system in Malaysia to e-learning. An overview of this study has then followed in later sections, providing more information on the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter Two comprises a review of all ranges of literature that are related to educational technology and theoretical framework of this study. Starting from the history of e-learning in Malaysia to the adoption of GC around the globe, the perception and acceptance of online learning among the teachers have also been reviewed. Further, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) is also discussed in detail, specifically localizing the theory into the educational context. Theoretical and conceptual frameworks addressing the research objectives and hypotheses are also established in this chapter with appropriate diagrams and explanations.

2.2 History of E-Learning in Malaysia

The Malaysian educational development and reformation have always been signalized by the government's attempts to adapt education to the needs of national development (Haji Ahmad, 1998). Dating back to the 1990s, first initiated by the arrival of the invention of computers and rise of the information age, the Malaysian government has commenced schools to be in line with the Malaysian Super Corridor (MSC) project. Haji Ahmad (1998)

notes that one of the remarkable runners of this attempt is the Smart School Project. The Smart School Project had been a pilot project back in January 1999, subsequently followed by other schools nationwide years later (Malaysian Ministry of Education, 2005). The project centralizes the idea of integrating the utilization of modern technology during teaching, primarily by accommodating the advent of technology into the classes which will be in schools.

Figure 2.1

The Smart School Milestones (Four Waves)
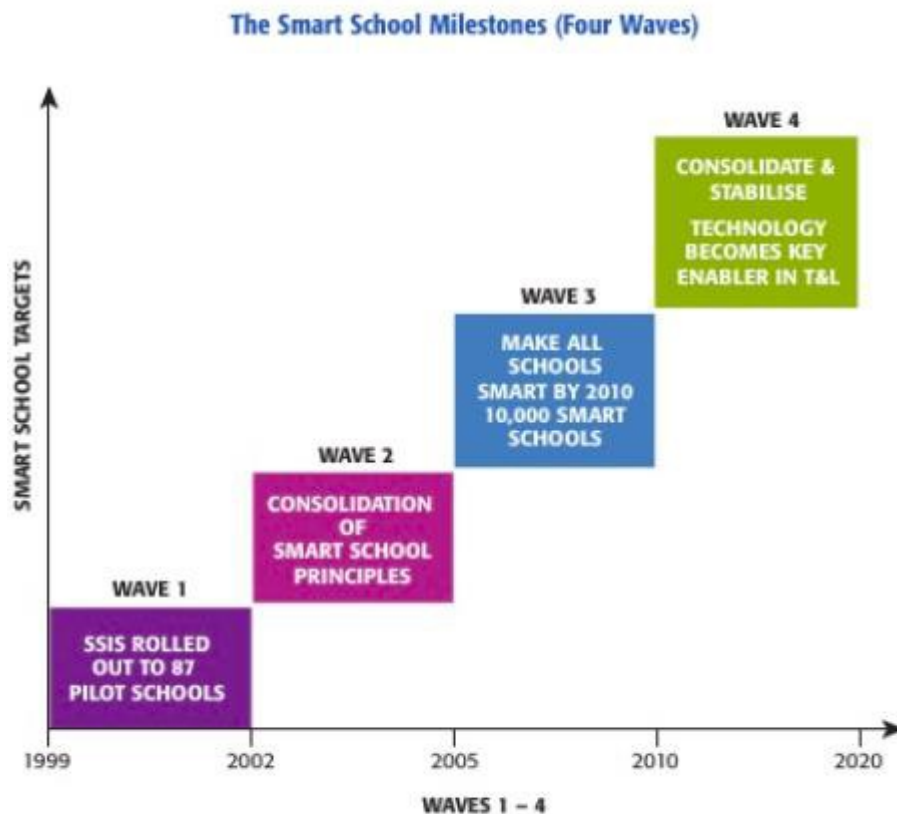
Source: Multimedia Development Corporation, 2005

Note. The figure shows that technology should become the key enabler in the

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teaching and learning in 2020. Reprinted from "The Smart School Roadmap 2005-2020: An education Odyssey" (p.11), by Multimedia Development Corporation, 2005, Ministry of Education. Copyright 2005 by Multimedia Development Corporation.

Referring to Figure 2.1, it is apparent that the Smart School implementation plan has been divided into four waves (Multimedia Development Corporation, 2005) with their respective goals, which are Wave 1-The Pilot (1999-2002), Wave 2-The Post-Pilot (2002-2005), Wave 3-Making All Schools Smart (2005-2010), and lastly Wave 4- Consolidate and Stabilise (2010-2020).

The venture of our government in integrating e-learning into the education industry was then continued with the introduction of the 1BestariNet project by MoE in 2012. As stated by the ministry, it is a project where an endeavor is made to connect over 10,000 government schools nationwide in Malaysia to the Internet. It also provides an online learning platform which is FROG VLE that is simple, fun, and engaging. Shen et al. (2017) indicated FROG VLE as the flag of the revolution in the Malaysian education industry, as it is the earliest cloud-based learning platform in accomplishing the aspiration of education in Malaysia.

According to the study by Cheok et al. (2017), it is believed that the Frog VLE is an initiative of the Malaysian government to leverage ICT usage in primary and also secondary schools in Malaysia. The previous initiative,

which is the Smart School Project despite having a huge consumption of expenditure, unfortunately only resulted with 80% of the teachers using ICT less than one hour per week and being further informed that it was mostly limited to word processing only (Leighton, 2012).

2.3 A Cloud-Based Learning Application: Google Classroom

Educational technologies are often incorporated in a classroom situation to allow learning to be personalized and autonomous for the students (Graham, 2006). The development and critics followed by the use of different educational technologies have found a middle ground through blended learning (Hinkelman, 2018). It allows a smooth transition from a modification in teaching methodology, benefiting teachers and learners. Thus, teachers nowadays can use different educational technologies, along with the traditional classroom setup, to enhance the learning experience and environment for the students, achieving the aspiration of using blended learning in classrooms.

Lin and Jou (2013) explain that the applications and programs, which are designed to facilitate communication and connectivity, are considered as applications of Web 2.0. Some of these applications and programs are SkyDrive, Evernote, Blackboard, Dropbox, and Google Apps. Among all these, cloud-based learning portals are considered as the most interactive approach due to their function of allowing multiple participants to collaborate across the Internet, without the requirement of storage on the participants'

hard drive (Shinsky & Stevens, 2011; Vickers et al., 2015).

GC is a noteworthy example of a free cloud-based learning application that is available for everyone. In 2014, Google Workspace for Education Fundamentals launched GC which is suitable to be used by teachers and students as an ideal, fitting application suitable for developing countries (Azhar & Iqbal, 2018). Since the introduction of GC as a cloud-based online learning platform in 2014, it has been explored by educators around the globe for almost seven years to boost the teaching and learning experience with the learners.

Several researchers have investigated the use of GC in classrooms, and they have highlighted the potential benefits of using GC. In the study by Mafa (2018), he discovered that GC offers multiple benefits which include empowering teachers to upload learning materials and also helping learners to remark and make inquiries, simplifying the management of tasks, courses and grades regardless of time constraints and geographical setting, and permitting ongoing collaboration in which learners can engage into active learning and share their thoughts online.

Other benefits are also reported: GC is time-saving, easy to use for interaction between teachers and students, and comprises useful features of various Google applications such as Google Docs, Google Slides, and Google calendar (Liu & Chuang, 2016; Martinez-Monés et al. 2017); it is also comparatively useful in many areas especially on perceived usefulness,

perceived ease of use, communication, interaction, and overall satisfaction of the students (Shaharanee et al., 2016).

2.4 A Comparison between GC and Other Online Learning Platforms

According to Abazi-bexheti et al. (2018), the arrival of e-learning has created challenges that go beyond educational issues, thus the new, advanced LMS is comprised of the elements which are related to the learning, teaching, creation, management and also communication. There are also other examples of LMS available for educators and learners around the world, some examples are Moodle, Edmodo, Blackboard, Sakai and Schoology. Some of the reasons, according to Jakkaew and Hemrungrote (2017) that lead to the advancement of GC becoming a popular, rapidly adopted tool among educators are due to its functionality in hosting and allowing parallel application of other applications in Google Workspace (formerly known as G Suite for Education), such as Gmail, Google Docs, Google Calendar, Google Drive and Google Hangout, thus achieving collaborative learning across devices, especially in mobile learning (Kumar & Bervell, 2019).

Besides, the nature of GC as a free web-based learning management platform and its convenience and greater appropriateness in performing mobile learning, as compared to other LMS software, have also improved the uptake intentions among the educators and learners in recent years (Kumar & Bervell, 2019). Therefore, this research aims to reveal the actual perception and usage of GC among the Malaysian secondary school teachers who have

integrated GC into their teaching process.

2.5 Perception and Acceptance of Online Learning among Secondary School Teachers

The perception and acceptance of online learning among secondary school teachers has been a ubiquitous topic ever since the initiation of e-learning by the ministry. The reformation of traditional classrooms into 21st-century classrooms symbolised by e-learning has taken place with the systemic evolution of Education 1.0 to Education 4.0. In most educational systems, teachers always play a prominent role in ensuring technology is effectively used in classroom teaching (Zhao et al., 2001).

In the current spate of Education 4.0, the educators have been continuously challenged by different issues when it comes to the actual use of educational technology or online learning platforms. According to Rogers (2010), the acceptance of technology will be hindered by the complexity of the information system. In this context, the dilemma of the Malaysian teachers in adopting various educational platforms, be it Frog VLE or GC, has long existed even in the present day. Technology adoption is part of daily life for many teachers, but for the others, it is also a collaborative learning experience in which they learn with the teachers they teach (Buabeng-Andoh, 2012). Despite the distinctiveness in personalities and teaching styles, teachers' perception of technology still has a crucial effect on their capability to integrate the educational technology entrusted to them (Ismail, 2015;

Kayalar, 2016).

Teo (2010) mentioned that an individual is conscious about his or her decision to accept a technology, according to the cognitive and behavioral approach in explaining the behavioural intention to use a certain technology. Thus, acceptance can be clarified by the underlying intention. Acceptance studies focus on the predictors of system adoption and use, with behavioural intention to use the system as a proxy for actual use.

On the other hand, it is pertinent to mention that the situation of slow adoption and uptake of educational technology among the Malaysian teachers can be related to the learning curve for new technology software, which is proposed by Glass (1999), as depicted in Figure 2.2.

Figure 2.2

Learning Curve for New Technology Software
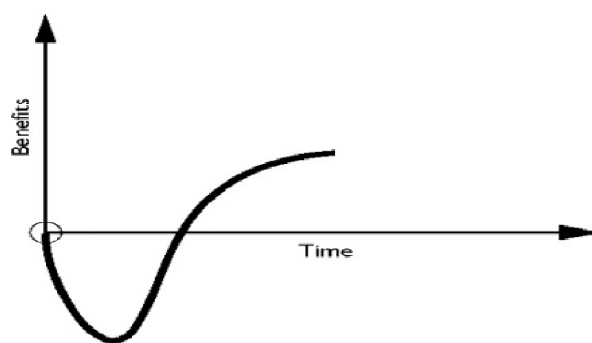
Note. Adapted from "The Realities of Software Technology Payoffs" by R. L. Glass, 1999, *Communications of the ACM, 42*(2), p. 78. Copyright 1999 by ACM.

With reference to the figure, the situation can be depicted based on the figure where initially, the teachers are adapting themselves into the use of technologies in the classroom, the potential benefits of using technology are not significant, which resulted in a downward movement of the graph rather than upward. As time progresses, there is a gradual increase of the line where teachers begin to realize the benefits of implementing technology in classrooms, as shown in the graph that there is an upward movement of the line and gradually becoming constant over time. The closure of schools during the COVID-19 pandemic can be inferred that such a situation allowed the teachers to further explore online learning and are aware of the benefits of using technology in conducting lessons amidst the pandemic (Mokhtar, 2020).

2.6 Theoretical Framework: The UTAUT 2

In 2003, Venkatesh and his colleagues in response to determine the acceptance of people on technology have developed the Unified Theory of Acceptance and Use of Technology (UTAUT) and later in 2012, they have included more elements into this theory which then leads to UTAUT 2 (El-Masri & Tarhini, 2017; Fard et al., 2016; Kuan et al., 2014; Raman & Don, 2013). Like its former theory, UTAUT 2 has received professional validation and reliability check by many scholars across the globe, which this theory is able to provide a vivid description of the acceptance and adoption of technology by people (El-Masri & Tarhini, 2017; Nistor et al., 2014).

Unlike most theories available in determining the use of technology among people, UTAUT 2 stands superior to these theories as it acknowledges, integrates, and develops a more comprehensive view of how people accept technology in life (Moorthy et al., 2019; Samsudeen et al., 2020). Most theories such as the Combined TAM and TPB (C-TAM-TPB), Diffusion of Innovation Model (DOI), Innovation Diffusion Theory (IDT), Model of PC Utilization (MPCU), Motivational Model (MM), Social Cognitive Theory (SCT), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), and Theory of Reasoned Action (TRA) often stand alone, describing only one aspect of using technology, which these make description of technology in the world people live in insufficient (Moorthy et al., 2019; Samsudeen et al., 2020). Further, Moorthy et al. (2019) described that these theories have failed to frame and construct enough evidence to depict the acceptance of people towards technology.

Even though these theories failed to provide a comprehensive picture of people's acceptance towards technology, they were all a result of the increased emergence of technology across the globe, which subsequently led to scholars' attention and technology then became the focus of many principles and fields (Kuan et al., 2014; Moorthy et al., 2019; Raman & Don, 2013; Samsudeen et al., 2020). In particular, scholars have been employing the UTAUT 2 in investigating technological acceptance and adoption in educational settings (Azizi et al., 2020; Garone et al., 2019; Raman & Don, 2013). In fact, Garone et al. (2019) have emphasized that UTAUT 2 has been

widely used in educational settings as this theory is significant in helping students to receive and experience professional development through the help of technology.

Thus, being a comprehensive, strongly validated theory, the UTAUT 2 now aims to provide a highly comprehensive view of technology acceptance and adoption by the people and their behaviours exhibited when using technology (Azizi et al., 2020; Fard et al., 2016; Kuan et al., 2014; Moorthy et al., 2019; Samsudeen et al., 2020). As stated by Kuan et al. (2014), Moorthy et al. (2019) and Samsudeen et al. (2020), due to the incorporation and integration of existing theories that look into technology acceptance, UTAUT 2 offers an advantage for researchers to divert themselves away from the dilemma of searching the appropriate theory to determine the acceptance of technology among the population of interest. Today, other than educational settings, many organizations have been researching on the technology acceptance by their target population using this model as more than 70% of the evidence found is concrete and reliable (Azizi et al., 2020; Kuan et al., 2014).

Furthermore, with the use of UTAUT 2, findings conducted can help address various deficiencies of using technology by the people, and policymakers, authorities, and practitioners can make efforts to improve or modify technology to provide a better, effective technological experience (El-Masri & Tarhini, 2017; Garone et al., 2019; Guggemos et al., 2020; Moorthy et al., 2019).

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2.6.1 Elements in the UTAUT 2

Within the UTAUT 2, a total of seven independent variables is available that helps generate a comprehensive view of technological acceptance and adoption by people (Azizi et al., 2020; El-Masri & Tarhini, 2017; Garone et al., 2019; Guggemos et al., 2020; Moorthy et al., 2019; Nistor et al., 2014; Raman & Don, 2013; Samsudeen et al., 2020). Each variable is as discussed in the following bullets given below:

1. Performance Expectancy (PE) – this refers to the degree of technology usage by people in order to receive benefits when performing activities.
2. Effort Expectancy (EE) – this refers to the extent of easiness of a person when using the technology to perform activities.
3. Social Influence (SI) – this refers to how other surrounding people having an influence over one's perception of using technologies in living.
4. Facilitating Condition (FC) – this refers to the degree of available infrastructure in an organization to support one's usage of technology to perform activities.
5. Hedonic Motivation (HM) – this refers to the enjoyment and preferences of using technology after experiencing it.
6. Habit (HB) – this refers to the tendency to perform a certain behaviour after using technology to perform activities.

7. Price Value (PV) – this refers to one's own knowledge of the monetary value of a certain technology introduced.

Among these seven independent variables, the Behavioural Intention (BI) serves as the mediator that influences the dependent variable being investigated (Moorthy et al., 2019; Samsudeen et al., 2020). In fact, with the presence of UTAUT 2, the variation of BI and technology usage has shown a greater picture, with 18% and 12% respectively (Kuan et al., 4 2014). The presence of moderators is also found in the UTAUT 2, which Moorthy et al. (2019) identify them as the people's age, gender, and experience.

2.6.2 Theoretical and Conceptual Frameworks

Venkatesh et al. (2012) have displayed a framework of how the UTAUT 2 functions (Moorthy et al., 2019). Initially, as the foundation of UTAUT 2, the UTAUT only comprised of four variables which were the performance expectancy, effort expectancy, social influence, and facilitating condition (Azizi et al., 2020; Raman & Don, 2013) but after the extension of UTAUT to UTAUT 2, the newly designed theory has incorporated hedonic motivation, habit, and price value to provide an even comprehensive view of technology acceptance by the people (Azizi et al., 2020; Raman & Don, 2013; Samsudeen et al., 2020). It was found that the addition of these three variables into the newly designed UTAUT 2 has helped in explaining an even greater variation of behavioural intention and technology usage by samples of the targeted population (Kuan et al., 2014; Moorthy et al., 2019). With statistically

significant results, Moorthy et al. (2019) have drawn a conclusion by stating that the UTAUT 2 was far more superior over other technology acceptance-related theories and models available in the field of technology.

Additionally, in both UTAUT and UTAUT 2 frameworks, variables such as age, gender, and experience which belong to individual differences were considered as moderators during the construction of these models (Raman & Don, 2013). However, these moderators have not been included in this study as to reduce the complexity of the model, and thus focusing on the key predictors of GC adoption among the teachers.

The original framework of the UTAUT 2 as proposed by Venkatesh et al. (2012) is as shown in Figure 2.3. On the other hand, with the combination of UTAUT 2 in the context of this study with the second and third research objectives, the conceptual framework of this present study is as depicted in Figure 2.4. The relationships between the constructs in UTAUT 2 are also shown as the ten hypotheses included in the conceptual framework of this study. As shown in Figure 2.4, the constructs involved are the performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, behavioral intention, and the use behavior of GC among the Malaysian secondary school teachers.

Figure 2.3

Theoretical Framework (Framework of the UTAUT 2)
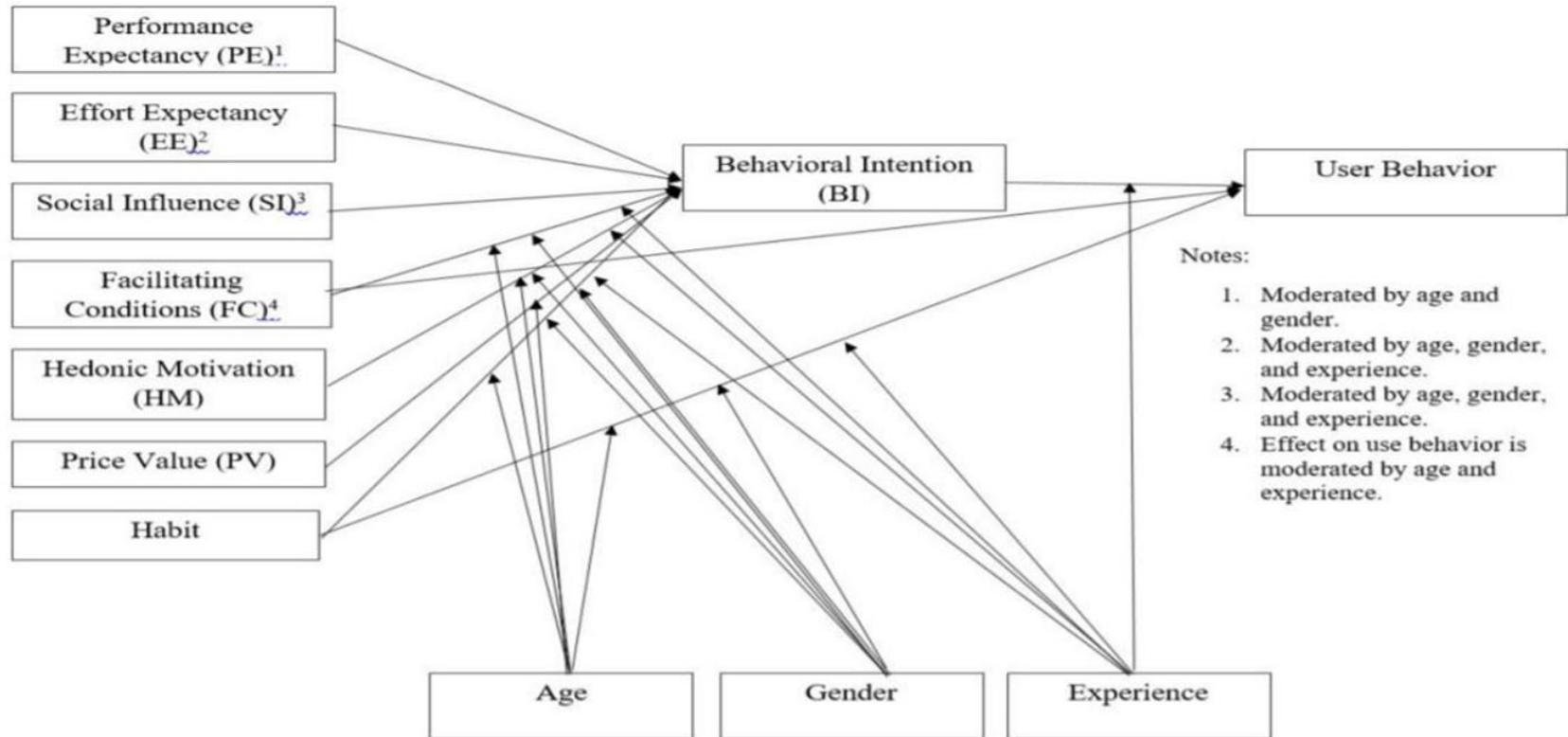
Figure 2.4

Conceptual Framework of This Present Study
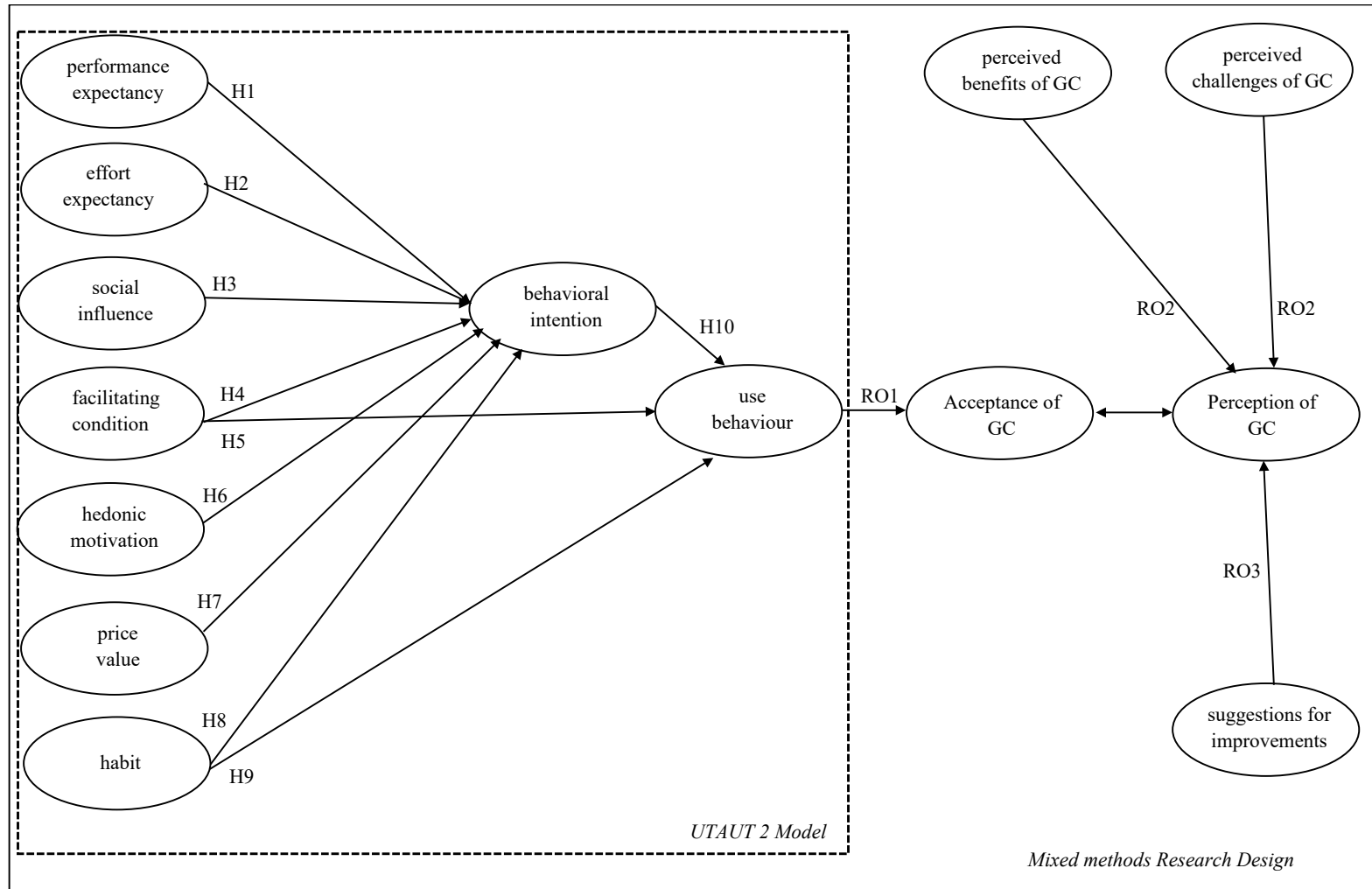
2.7 Malaysian Studies Related to Technology Acceptance

This section serves to provide a table that contains a list of past studies which are related to technology acceptance in the field of education and the employment of relevant theories or models. The selection of past studies was based on the following criteria:

1. The selection of articles must have the indexing acknowledged by Scopus, Web of Science (WOS), Web of Science Emerging Sources Citation Index (WOS ESCI), Educational Resources Information Centre (ERIC), or the Malaysian Citation Index (MyCite).

2. The selected articles must be within the period of 10 years, which meant that only articles between years 2011 and 2021 were chosen.

3. All articles selected must be related to the use of technology within the Malaysian context to provide a comprehensive overview on the state of technology in the country. Other articles conducted beyond the Malaysian context were discarded.

In this section, a brief description of the objectives, methods, and findings of the research is provided as well. At the end of the section, an overall conclusion is made to state the gaps identified from this research along with the rationale and significance of conducting this study. Table 2.1 showed the list of research conducted.

Table 2.1

List of Research on Technology Acceptance

Author(s)	Objectives and Methods	Findings
Raman and Don (2013). Preservice teachers' acceptance of learning management software: An application of the UTAUT 2 model.	• To investigate the relationships between the constructs that may influence preservice teachers' acceptance of Learning Zone (Moodle in their learning process. • To assess the influence of variation on performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and the habit to the behavioral intention or intention of usage. • Employed the UTAUT2.	• UUM students only used LMS for academic purposes. • Students were not willing to use Moodle as LMS. • Social influence was the significant variable on students using LMS. • Performance expectancy and effort expectancy have impact on behavioural intention.

| Tajudeen et al. (2013).

Determinant of mobile devices acceptance for learning a mong students in developing country.	• To understand the determinant of mobile devices for learning among students in the developing world. • Technology Acceptance Model was used.	• No significant difference in acceptance to use mobile device for learning among science and non- science students. • Significant difference in acceptance to use mobile device for learning among male and female students. • PU, PE, FC, and BI were found to significantly influence students 'acceptance of Mobile Device for learning.

Wong et al. (2013). Understanding student teachers' behavioural intention to use technology: Technology Acceptance Model (TAM) validation and testing.	• To validate and test the TAM in the context of Malaysian student teachers' integration of their technology in teaching and learning. • Technology Acceptance Model.	• PU is a significant influence on Attitude towards computer use and behavioural intention. • PE of use significantly influences PU. • BI is found to be influenced by attitude towards computer use.
Kuan et al. (2014). UTAUT2 influencing the behavioural intention to adopt mobile applications.	• To identify the key determinants that influence the BI to adopt mobile apps. • UTAUT2 model.	• HT has the most significant influence on behavioural intention. • PV and FC do not influence behavioural intention.

| Fard et al. (2016). | • To examine the acceptance and use of social networking sites in a marketing setting. | • PE and HM were the main factors that influence users' online purchase intention (PI) through social networking sites (SNSs) in Malaysia. |
| Factors affecting Malaysian university students' purchase intention in social networking sites. | • UTAUT2 model. | • Gender significantly moderated purposed association between the four elements and online PI. Moderating effect of age was only recognized in PE. |

Halili et al. (2017). Information and communications technology acceptance among Malaysian adolescents in urban poverty.	• To identify the ICT usage among adolescents in urban poverty. • To identify their acceptance of using ICT in teaching and learning process. • Technology Acceptance Model.	• Majority of the respondents do not spend much time in using ICT at home or even during class session. • The acceptances in using ICT among the respondents are positive in teaching and learning process.
Moorthy et al. (2019). Habit and hedonic motivation are the strongest influences in mobile learning behaviours.	• To identify the factors affecting accounting students' BI to accept mobile learning. • UTAUT 2 model.	• Habits have the most influence on accounting students' intention on accounting students' intention to adopt mobile learning.

Rauf and Suwanto (2020). Attitudes and technology integration among ESL secondary school teachers in Sabah.	• To examine ESL teachers' attitudes towards the use of technology in the teaching of English at	• ESL secondary school teachers in Sabah have positive beliefs and attitudes towards technology integration. • There is no significant difference between teachers' technology integration regarding their age.
Zainal and Zainuddin (2020). Technology adoption in Malaysian schools: An analysis of national ICT in education policy initiatives.	• To examine the research studies on large-scale initiatives introduced to digitize the Malaysian education system, from the Smart Schools program to the incorporation of the Frog VLE in the classroom.	• Teachers' responses to the two different ICT in education initiative are tied to aspects such as teachers' professional development activities and their competence in and use of ICT. • The types of learning through technology implementation also affects students' achievement.

2.7.1 Summary and Gaps Identified in the Past Studies Conducted

In Malaysia, the Ministry of Education has been striving to provide quality technology to support learning in all educational settings and it is the Ministry's aspiration to have students to receive adequate support so as to develop necessary skills to contribute to the country (Malaysian Ministry of Education, 2013). For many years, the Ministry has been spending a considerable amount of money to ensure that technology is available in schools further checking if the methods of teaching in schools are in par with the 21st century learning (Malaysian Ministry of Education, 2013; Wong et al., 2013). Along with the cooperation with other education ministers in the Southeast Asia Ministers of Education Organization (SEAMEO), Malaysia has received numerous assistance from other countries in this organization to provide quality education for the children (Wong et al., 2013).

Understanding the extent of acceptance of technology by educators is crucial as the introduction of technology into classrooms comes with the aim to deliver quality lessons that helped in boosting the teaching and learning process (Wong et al., 2013; Zainal & Zainuddin, 2020). The emergence of various technology acceptance-related theories and models was to help understanding consumers' extent of accepting technology into lives (Wong et al., 2013) and specifically in the field of education, merely implementing technology into pedagogical practices does not simply mean the teaching and learning processes that have occurred in classrooms are successful (Wong et al., 2013; Zainal & Zainuddin, 2020). Rauf and Suwanto (2020) and Wong et

al. (2013) have also previously identified that there remains an existing group of in-service and pre-service teachers who still show resistance and negative attitudes towards the use of technology in classrooms and that they are inclined to use traditional pedagogical methods in classroom teaching and learning.

Based on the table provided, it can be seen that the general acceptance of technology was rather positive (see Halili et al., 2017; Rauf & Suwanto, 2020). However, there was no definite conclusion on which independent variables as proposed in the UTAUT 2 had the most influence on the behavioral intention (BI) of the targeted participants in their study. In addition, there was an influence of the moderators that have affected the behavioral intention of the targeted participants (Fard et al., 2016; Tajudeen et al., 2013).

Furthermore, a majority of the studies identified had recruited participants only from higher education institutions in Malaysia (see Fard et al., 2016; Kuan et al., 2014; Moorthy et al., 2019; Raman & Don, 2013). Studies conducted on technology acceptance among Malaysian secondary schools were limited and in the case of the table provided, only one study by Rauf and Suwanto (2020) was the most recent article available in the literature, with an addition that the participants recruited were specifically limited to the context of English language learning. Like Zainal and Zainuddin (2020) and Rauf and Suwanto's (2020) emphasis on introducing technology in schools, Tajudeen et al. (2013) has long argued that attention should be given to technology usage in Malaysian secondary education schools as this is equally

important to achieve education outcomes of the country.

The evidence was thus clear, the limited literature of technology in Malaysian secondary education context further with the emphasis of the importance of addressing Malaysian secondary education in contributing to education outcomes of the country must be addressed. Therefore, it was the researcher's intention to conduct the study that involved members of the Malaysian secondary education institutions, especially in terms of their technology acceptance and extent of using technology in the teaching and learning process.

2.8 Summary

In brief, Chapter 2 encompasses the review of previous studies and information gathered around the topic related to the study, besides the theoretical framework and the conceptual framework of this study. UTAUT 2 is a well-established framework for understanding the factors that influence the acceptance and adoption of GC among the Malaysian secondary school teachers. In this mixed-method study, UTAUT 2 is used as a theoretical framework to guide both quantitative and qualitative data collection and analysis. The mixed method approach as shown in the conceptual framework can provide a more comprehensive understanding of the complex factors that influence the adoption of GC, thus helping the educators and policy makers to develop effective strategies for promoting the use of an online learning platform like GC in the future.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology employed in conducting the study. The chapter begins with explaining the research design used, followed by the sampling methods, research instruments, data collection and analysis procedures, and ethical considerations. The explanation of the methodology serves to give and generate new insights into the use of GC, in terms of perception and acceptance from the Malaysian secondary school teachers' point of view.

3.2 Research Design

To achieve the established research objectives, a mixed-method research design, specifically a convergent design is employed. The purpose of a convergent design is to concurrently collect both quantitative and qualitative data, merge the data and use the results to understand the research problems (Creswell, 2022). Although mixed-method research design is generally less popular than the mainstream qualitative and quantitative designs (Teddlie & Tashakkori, 2009), it is useful and effective in enhancing the accuracy and

significance of the research by confirming the findings obtained further providing a meaningful conclusion towards the phenomenon being researched on (Creswell & Clark 2011; Creswell, 2014; Creswell & Guetterman, 2019; Kumar, 2014; Teddlie & Tashakkori, 2009). Over the past two decades, this research design has gained significant popularity among researchers and presently, it is widely adopted in numerous research disciplines such as education, health, psychology, and sociology (Bentahar & Cameron, 2015; Bernard, 1994; Creswell & Clark, 2011; Teddlie & Tashakkori, 2009).

The mixed-method research design comes with its own research philosophical worldview known as pragmatism (Creswell, 2014). Proponents of pragmatism advocated the use of more than one method, through both quantitative and qualitative inquiries, in successfully solving a research problem further generating a larger worldview in seeing a phenomenon of interest (Creswell, 2014; Greenie & Caraccelli, 1997; Tashakkori & Teddlie, 1998). Taking the pragmatism stance in research also enables researchers to reduce the bias on research inquiries into minimum, where the highly objective manner of quantitative inquiries can be explained through in-depth interviews in qualitative inquiries; and that subjective perception towards a phenomenon can be described through generalizations in quantitative inquiries (Creswell & Clark, 2011; Creswell, 2014; Creswell & Guetterman, 2019).

As such, the adoption of convergent mixed method research design of this study sets at finding the answers to the research questions established, which

are to determine the perception and acceptance of GC among Malaysian secondary school teachers, and explore the benefits and challenges encountered by the teachers during the adoption of GC. According to Creswell (2022), the convergent design allows both forms of data to provide different insights, and the combination also contributes to seeing the problem from multiple viewpoints and perspectives. As both findings are useful, the combination adds up to not only more data but also a more extensive understanding of the problem than what would have been provided by each database alone (Creswell, 2022).

3.3 Sampling

The accuracy of findings in any research depends greatly on the selection of samples (Kumar, 2014). The following subsections describe the sampling methods employed and how sample size is calculated.

3.3.1 Sampling Methods

The target population of this study is the Malaysian secondary school teachers across the country. Goh and Foo (2019) have extensively described the geographical overview of the country in detail: Malaysia is located in Southeast Asia, and it is divided by the South China sea into two regions, namely Peninsular Malaysia and East Malaysia. Presently, Malaysia is made up of 13 states and three federal territories, with Sabah, Labuan and Sarawak located in

East Malaysia, and the remaining states are in Peninsular Malaysia. Further, Peninsular Malaysia can be divided into four different regions, the northern region (Perlis, Kedah, Perak and Pulau Pinang), southern region (Negeri Sembilan, Melaka, and Johor), East Coast region (Kelantan, Terengganu, and Pahang), and Central region (Selangor, Putrajaya and Kuala Lumpur).

For the purpose of this study, a two-phase sampling method is used where it entails the use of two sampling methods to approach the necessary participants as accurately as possible. Given the wide range of numbers of Malaysian secondary school teachers, it is not possible to have every school teacher participate in this study, as such, appropriate sampling techniques must be employed.

In this study, the sampling method is divided into two different phases, with Phase 1 and Phase 2 respectively. Phase 1 involves the use of simple random sampling method and Phase 2 uses the purposive sampling method. The sampling method used in Phase 1 aims at achieving generalisation of data to the Malaysian secondary school teachers through questionnaires while Phase 2 aims at gathering in-depth, meaningful responses from the purposely selected Malaysian secondary school teachers. Figure 3.1 depicts the phases of the sampling method used in this study.

Figure 3.1

Phases of the Sampling Method

```
┌─────────────────────────────┐
│          Phase 1            │
│                             │
│   Simple random sampling    │
│      (Questionnaire)        │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│          Phase 2            │
│                             │
│    Purposive sampling       │
│        (Interview)          │
└─────────────────────────────┘
```
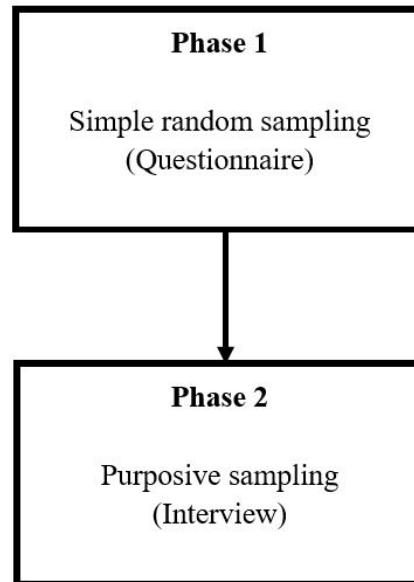
As shown in Figure 3.1, Phase 1 involves the use of simple random sampling method. Simple random sampling method refers to a type of probability sampling where a subset of participants from a population is randomly selected (Creswell, 2014). As of 31st January 2020, the Ministry of Education Malaysia (2019a) has reported that the population of Malaysian secondary school teachers is almost at 18,000 teachers. Since it is not economically feasible to distribute the questionnaires to all the teachers, simple random sampling is crucial in ensuring that each secondary school teacher has an equal chance of being selected as one of the participants of this study.

As such, in the simple random sampling method, the researcher first identifies the secondary schools throughout the country. This is then followed by narrowing the secondary schools to public secondary schools in the country.

The rationale of selecting public secondary schools is due to the reason of the GC implementation as instructed by the Ministry following the occurrence of the COVID-19 pandemic where all educational sectors have to remain closed.

As mentioned earlier, the simple random sampling method is a probability sampling method where members of the population have an equal chance of being selected to participate in a study (Creswell, 2014; Creswell & Guetterman, 2019). Thus, the use of the random sampling method aims to provide generalisation of the findings to the population being investigated and the process of selecting the members of the population is not biased but rather, randomised (Creswell, 2014; Creswell & Guetterman, 2019). As such, the researcher distributes the questionnaire randomly to the public secondary schools. The researcher has gathered the list of public secondary schools and entered them as numbers in a random number generator on Calculator.net (https://www.calculator.net/random-number-generator.html). From the random number generator, the generator randomly selects 80 secondary schools and formal emails with the link to the online questionnaire of this study were sent to the official emails of these schools accordingly.

In brief, the Phase 1 of the data collection starts with the defining of the population of interest, which are the public secondary schools. Then, each school has been assigned with a number as identifier, with a total of 2436 schools in the list. Next, the researcher uses a random number generator to select a total of 80 schools. Formal emails with the link to the online questionnaire, the approval

letters from the Ministry of Education (JPN) and the Department of Education (KPM) have been sent to the official emails of the schools. The researcher also sent reminder emails to these schools while observing the progress of the data collection.

Phase 2 begins after the researcher has collected all the questionnaire responses from the secondary school teachers. In Phase 2, the researcher uses the purposive sampling method in selecting teachers for interview purposes. The purposive sampling method involves the purposive selection of participants that are able to provide rich responses and best meet the objectives of the research (Creswell & Guetterman, 2019; Palinkas et al., 2015). When conducting the purposive sampling method, there is a need to establish a set of defined criteria prior to selecting the samples from the population (Palinkas et al., 2015). As the intention of Phase 2 is to select teachers for interview purposes, the criteria in selecting the respondents are that the interviewees must be (1) secondary school teachers (2) have experience using GC during the pandemic, and (3) completed the questionnaire distributed. Based on the responses received, the researcher then selects those secondary school teachers who have met the criteria for interviews.

3.3.2 Calculating the Sample Size

As stated, the targeted population in this study is Malaysian secondary school teachers in public secondary schools across the country. According to the

statistics from the Ministry of Education Malaysia (2019a), the population of Malaysian secondary school teachers was 17,9770 teachers as of 31st January 2020. For a study that shows high quality and accuracy in presenting the findings, the sample size must be reliable and precise (Creswell, 2014; Palinkas et al, 2018). In this study, the sample size formula from Krejcie and Morgan (1970) is employed, to which the calculation is as follows:

$$S = \frac{X^2 NP\,(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

S = Required sample size

X^2 = The table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N = The population size

P = The population proportion (assumed to be .50 since this would provide the maximum sample size)

d = The degree of accuracy expressed as a proportion (.05)

By substituting the necessary values along with the total population of secondary school teachers (N = 17,9770) as stated by the Ministry, the following equation is obtained:

$$S = (3.841) (179770) (0.50) (1-0.50) \times (0.05) 2 (179770 - 1) + (3.841) (0.50)$$
$$(1-0.50)$$

$$= 383.2831112$$

Therefore, the minimum required sample size of Malaysian secondary school teachers in generating the necessary quantitative findings of this study is to have at least 384 teachers. As for the sample size needed for qualitative data collection, it is not fixed but rather, the researcher follows the recommendation provided by Guest et al. (2020) and Saunders et al. (2018), to which the interviews are conducted until the saturation point is achieved. In any qualitative interviews, saturation refers to the point where the researcher is unable to identify any new codes from the data gathered and analysed (Guest et al., 2020; Saunders et al., 2018; Urquhart, 2012).

Data saturation further refers to the constant repetition of findings and the extent where the researcher begins to see redundancies across the data obtained from the samples (Saunders et al., 2018; Urquhart, 2012). Saunders et al. (2018) further mentioned that the decision of data saturation relies on the researcher's empirical sense, to which the researcher is capable of arguing that any possible new findings no longer contribute to achieving the research objectives. By referring to the guide as explained by Saunders et al. (2018), the researcher conducts the interview with the secondary school teachers and analyses the data received until she perceives saturation is achieved with evidence.

Figure 3.2

Flowchart of the Data Collection
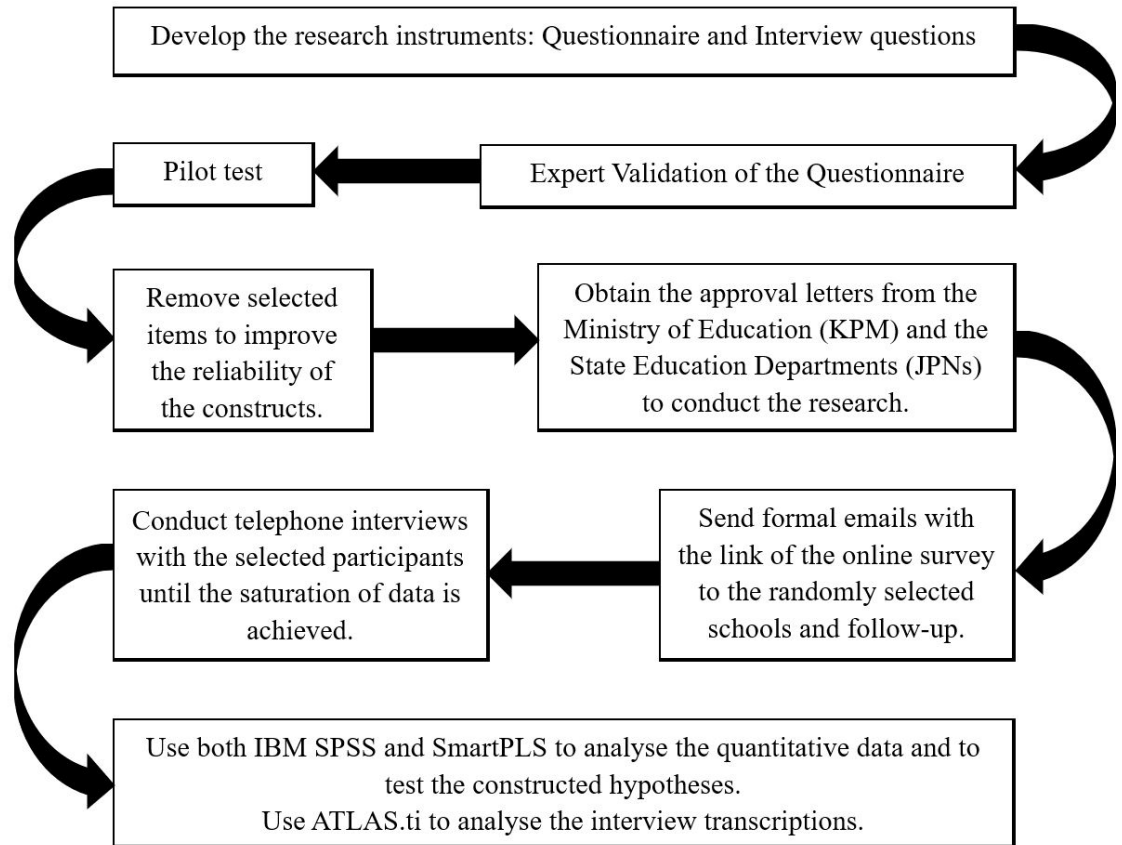
3.4 Procedures of the Data Collection

To collect the necessary data, the researcher has divided the process of data collection into eight different phases and these phases are as shown in Figure 3.2.

- Phase 1 – The researcher develops the research instruments for both the quantitative and qualitative data, which are the questionnaire (see Appendix B) and the list of interview questions (see Appendix D).

- Phase 2 – The researcher invites two experts in the field to confirm that the face validity is achieved and to ensure that the adapted survey questionnaire is appropriate for actual research.

- Phase 3 and 4 – The researcher runs the pilot test, resulted in the removal of five questions to further improve the reliability of the constructs.

- Phase 5 – The researcher obtains the approval letters from the Ministry of Education (KPM) and the State Education Departments (JPNs) to conduct the research.

- Phase 6 – The researcher sends formal emails with the link of the online survey to the selected schools together with the approval letters from the KPM and JPNs. The researcher also sends reminder emails occasionally to follow up with the progress of the data collection.

- Phase 7 – The researcher conducts telephone interviews with the selected participants until the saturation of data is achieved.

- Phase 8 – The researcher uses both IBM SPSS and SmartPLS to analyse the quantitative data and to test the constructed hypotheses. The researcher also uses ATLAS.ti to analyse the qualitative data.

3.5 Development of Research Instruments

This section discusses the research instruments employed in achieving the research objectives established. The following sub-sections describe in detail on the research instruments employed.

3.5.1 Questionnaires

The presently used questionnaire is an integration of self-developed items with the adapted items from Venkatesh et al. (2012), Hussein et al. (2020), Teo (2011), Weng et al. (2018), Attuquayefio and Addo (2014), Berry (2017), Nikolopoulou et al. (2020) and Ameri et al. (2020)'s questionnaires. The selected items were firstly adapted into the context of GC upon obtaining consent from the aforementioned researchers. Firstly, Venkatesh et al. (2012) 's questionnaire was adapted by merely replacing the keyword "mobile Internet" to "Google Classroom" while retaining the remaining items in their original state with no alterations performed. Then, other items from the other researchers were added into the respective constructs to make the questionnaire more comprehensive. Later, self-developed items were also added into the questionnaire to make it more inclusive of the context of the study, see Table 3.1 below.

Table 3.1

Adaptation of Items for the Questionnaire

Construct	No.	Reference	Adapted Survey Item (After Expert Validation)
Performance Expectancy	PE1		I find Google Classroom useful for the work/teaching.
	PE2	Venkatesh et al. (2012)	Using Google Classroom increases my chances of achieving learning outcomes that are important.
	PE3		Using Google Classroom helps me accomplish tasks related to my work/teaching more quickly.
	PE4		Using Google Classroom increases my work/teaching productivity.

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	PE5	Hussein et al. (2020)	Using Google Classroom enhances my interactions with students.
Effort Expectancy	EE1	Venkatesh et al. (2012)	Learning how to use Google Classroom is easy for me.
	EE2		My interaction with Google Classroom is clear.
	EE3		My interaction with Google Classroom is understandable.
	EE4		I find Google Classroom easy to use.
	EE5		It is easy for me to become skilful at using Google Classroom.
	EE6	Hussein et al. (2020)	It is easy for me to understand how to perform tasks using Google Classroom.
Social Influence	SI1	Venkatesh et al. (2012)	People who are important to me think I should use Google Classroom.
	SI2		People who influence my behaviour think that I should use Google Classroom.
	SI3		People whose opinions I value, prefer that I use Google Classroom.
	SI4	Self-developed	My peers think I should use Google Classroom.
	SI5		My school management encourages me to use Google Classroom.
Facilitating Conditions	FC1	Venkatesh et al. (2012)	I have the necessary resources to use Google Classroom.
	FC2		I received guidance from others to use Google Classroom.
	FC3		Google Classroom is compatible with other technologies that I use (e.g., Google Meet, Google Doc, Google Calendar, DELIMa, Cikgootube, EduWebTV, Kahoot, Padlet).
	FC4		I can get help from others when I have difficulties using Google Classroom.
	FC5	Teo (2011)	When I encounter difficulties in using Google Classroom, I am given timely assistance (e.g., guidance, specialised instructions or technical personnel).
Hedonic Motivation	HM1	Venkatesh et al. (2012)	Using Google Classroom is fun.
	HM2		Using Google Classroom is enjoyable.
	HM3		Using Google Classroom is entertaining.

	HM4	Teo (2011)	I look forward to those aspects of my job that require the use of Google Classroom.
	HM5	Self-developed	Using Google Classroom gives me satisfaction.
	HM6		Using Google Classroom makes me to have the feeling of contentment.
Price Value	PV1		The Internet used for Google Classroom is reasonably priced.
	PV2		The online platform using Google Classroom during the pandemic is a good value for money.
	PV3	Venkatesh et al. (2012)	The gadget(s) that I used to access Google Classroom is reasonably priced.
	PV4		At the current practice, Google Classroom provides a good value.
	PV5		With the current amount of money that I have spent, Google Classroom provides a good value.
	PV6	Self-developed	I am ready to spend for continued adoption of Google Classroom.
Habit	HT1		The use of Google Classroom has become a habit for me.
	HT2	Venkatesh et al. (2012)	I tend to regularly use Google Classroom.
	HT3		I must use Google Classroom.
	HT4		Using Google Classroom has become natural to me.
	HT5	Self-developed	I practically use Google Classroom for my work/teaching.
Behavioural Intention to Use	BIU1		I intend to continue using Google Classroom in the future.
	BIU2	Venkatesh et al. (2012)	I will always try to use Google Classroom for my work/teaching.
	BIU3		I plan to continue to use Google Classroom frequently.
	BIU4	Weng et al. (2018)	I'd love to use Google Classroom in my class.
	BIU5	Teo (2011)	I expect that I would use Google Classroom frequently in the future.
	UB1	Berry (2017)	I currently use Google Classroom.

	UB2	Self-developed	I use Google Classroom during the pandemic.
	UB3	Attuquayefio and Addo (2014)	I use Google Classroom for accessing the homework/assignments of my students.
	UB4	Self-developed	I use Google Classroom for uploading materials/posting announcements/posting homework.
Use Behaviour	UB5	Nikolopoulou et al. (2020)	I use Google Classroom as a supporting tool for my work/teaching.
	UB6	Self-developed	I use Google Classroom for online teaching.
	UB7	Ameri et al. (2020)	I spend a lot of time on Google Classroom for my work/teaching.

In the present questionnaire, it consisted of two parts: The first part contains a brief instruction and items on personal demographic details inclusive of age, gender, name of school, subject(s), and form(s) teaching. This information gathered is necessary to provide a better picture of the teachers' background. The second part of the questionnaire is composed of 30 items (see Table 4.1 for the actual items included in the questionnaire after the Cronbach's Alpha reliability test), in which all items are presented using the five-point Likert scale. Simply, '1' refers to Strongly Disagree and '5' refers to Strongly Agree. The teachers are required to respond to the items by indicating the points on the scales. In the second part of the questionnaire, statements related to performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), hedonic motivation (HM), price value (PV), habit (HB), behavioural intention (BI) and use behaviour (UB) towards the use of GC were queried.

The collecting of data for questionnaire was done through Qualtrics, a popular research software capable of designing various kinds of standard surveys with intuitive editing and user-friendly functions to gather data (Arndt et al., 2022; Molnar, 2019). Like most surveys that are cost and economically effective further capable of reaching targeted participants transcending geographical and time aspects (Creswell, 2014; Creswell & Guetterman, 2019), Qualtrics is a superior form of technology-based surveys that is widely used and meets contemporary industrial needs for research while maintaining its natural benefits (Arndt et al., 2022; Molnar, 2019). Further, one major advantage offered by Qualtrics is that it allows screening of data to ensure accurate data is presented and filter the responses received by detecting any flaws among the responses (Arndt et al., 2022). As an example, Qualtrics is capable of detecting missing responses for easy discarding of response before data analysis and the option of removing responses where the respondent simply fills in the survey by choosing one option only throughout (also known as the 'speeders').

3.5.2 Interviews

As for the in-depth interviews, interview questions related to the perceived benefits and challenges encountered during the adoption of GC are asked among the secondary school teachers. The list of interview questions is as attached in Appendix D. Presently, as there is no specific literature on the use of GC in secondary schools (see Kumar & Bervell, 2019; Shaharanee et al., 2016) neither in the context of COVID-19 that offer interview questions to be adopted

for the purpose of this study, the interview questions were constructed from the literature available and employed during the interview process.

An interview protocol was established prior to conducting the interview sessions. The interview protocol is necessary as it informs the flows of conducting the interviews and the questions to be asked to the participants (Creswell & Guetterman, 2019; DeJonckheere & Vaughn, 2019). Further, having an interview protocol allows researchers to plan in advance how the interview should be but also permitting flexibility during the interview process (DeJonckheere & Vaughn, 2019). Table 3.2 displays the interview protocol that the researcher complied to when conducting the research.

Table 3.2

Interview Protocol Employed.

Before interviewing:
- Check if all the interview questions are ready.   - Check if notes for field noting are ready.   - Check if the necessary stationery for field notes is ready.   - Check if the recording device is fully functioning.   When participant(s) joins the interview,   - Check if both sides are able to hear and listen each other clearly.   - Inform and seek consent from the participant(s).   - Check if the participant(s) is ready for the interview.
During interviewing:
- Begin the interview by following the interview questions.   - Ask the participant(s) on demographic details: Age, Area of school, Teaching Experience, Form(s) and Subject(s) that are currently teaching.

• Ask the participant(s) on the benefits that they have perceived throughout the online teaching and learning process.
• Ask the participant(s) on the challenges that they have encountered while using GC.
• Ask the participant(s) on the suggestions that can improve the teaching and learning experience using GC.
• Take notes where necessary.
After interviewing:
• Thank the participant(s) for joining the interview.
• Allow the participant(s) to inquire for more.
• Allow the participant to leave the interview.
• Check if the interview recorded is functioning.
• Label the interview recorded for easy retrieval before data analysis.

The participants selected for the interviews were those who have left their contact numbers voluntarily in the survey administered. The interview was then conducted using telephone interviews, which is a widely used method in inquiring data and offers numerous benefits such as allowing easy access, permitting real-time interaction, contacting at any time and place, and reducing the time needed to contact the participants (Bolderston, 2012; Crano et al., 2015; Creswell, 2014). In this study, the researcher contacts the participants based on the numbers left in the survey administered and seeks their permission to be interviewed in gathering the necessary data for analysis purposes. As such, in this study a total of 31 secondary school teachers have participated in the telephone interviews.

3.6 Reliability and Validity of the Research Instruments

Prior to conducting the research, a pilot test was conducted where it involved 37 public secondary school teachers. Pilot testing is essential as it allows the researcher to determine if the research instruments are suitable, appropriate, and ready to be employed in the larger, actual research (Creswell & Guetterman, 2019; Fraser et al., 2018; In, 2017). In most pilot tests, a sample size of 30 respondents is considered sufficient in determining if the research instruments are ready for a larger scale research (Creswell & Guetterman, 2019; In, 2017). The following sub-sections describe the reliability and validity of the research instrument deployed.

3.6.1 Reliability

Reliability of research refers to the extent of how accurate and consistent findings are based on the research instrument employed (Creswell, 2014). The reliability of the adapted questionnaire is tested through a reliability test, in which the Cronbach's alpha is referred to. As a general rule of thumb, the alpha values that are in between .70 and above indicate that the items are highly reliable (Heale & Twycross, 2015; Taber, 2018; Valim et al., 2015) while a value of zero indicates no reliability (Gay & Airasian, 2003).

As for the reliability of the qualitative findings done through thematic analysis, intra-rater reliability is employed wherein the researcher assesses the

findings obtained over a number of trials within a determined period of time (Merriam, 2009; Nowell et al., 2017; Scheel et al., 2018). During the analysis of the interview responses, the researcher performs the same assessment on the themes generated at least once per week, and continuously for eight weeks by which the researcher decides the themes as finalised findings for reporting purposes. By repeating the trials on analysing the themes generated, the process also aids in establishing the trustworthiness, or also known as validity of the study (Nowell et al., 2017).

3.6.2 Validity

Validity of a research instrument refers to the degree by which it measures what it is supposed to assess in a specific study (Heale & Twycross, 2015; Pallant, 2013; Taber, 2018; Valim et al., 2015). Addressing the different types of validity helps in increasing the effectiveness of the research instruments to be employed and ensuring the accuracy of the research is achieved (Creswell, 2014). As stated, the questionnaire employed in this study was adapted from previously developed questionnaires. The adaptation is to achieve content and construct validity, to which it fits the purpose of the study further answering the research questions established. Construct validity is the extent to which the domains actually assess what it is intended to assess (Creswell, 2014; Trompenaars et al., 2005) and content validity is defined as the extent to which a measure assesses all the important aspects of a scenario that it claims to measure (Creswell, 2014; Zechmeister et al., 2001).

The survey questionnaire is first validated by experts to ensure face validity is achieved, in which these experts are from the Universiti Pendidikan Sultan Idris (UPSI) and Universiti Putra Malaysia (UPM) respectively (see Appendix K and L). From the feedback obtained, the experts have commented on the language use and checked on the grammatical structures to ensure that the adapted survey questionnaire is appropriate for actual research.

Establishing validity of qualitative findings involves looking into the trustworthiness of the data (Nowell et al., 2017). This study conforms to the steps as provided by Nowell et al. (2017), in which all interview responses and field notes taken were presented as entries in ATLAS.ti, open coding and axial coding were performed, and both themes and sub-themes generated were supported with visualised diagrams. In the context of this study, figures of themes related to the benefits, challenges, and suggestions of using GC in classroom among the secondary school teachers from network diagrams generated from ATLAS.ti were referred (see Appendix O, P, and Q).

3.6.3 Triangulation of Data

As the mixed method research design allows freedom and flexibility in selecting the best research methods to conduct the study irrespective of paradigm and applicable in various complex situations (Kumar, 2014), the validity of a

mixed method research design is achieved whereby the confidence or reliability of results is boosted when two or more methods manage to assemble congruent or comparable data (Babchuk, 2019; Brewer & Scandlyn, 2022; Creswell, 2014; Jick, 1979).

When elements from qualitative and quantitative models are integrated into the research process, it is often found to accommodate the idea of triangulation (Lichtman, 2012). Triangulation is generally defined as the integration of data or methodologies so that diverse viewpoints shed light upon a phenomenon (Babchuk, 2019; Brewer & Sandlyn, 2022; Creswell, 2014; Olsen, 2004). Further, triangulation allows researchers to dictate if the research design is properly implemented, methods used are justified, and data analysis methods are appropriately used (Babchuk, 2019). In the context of this study, the triangulation of data and methodologies are achieved by integrating the findings of the questionnaire and results from the interview sessions.

3.7 Data Analysis Techniques

Data analysis is conducted through two different methods, in which quantitative data obtained from the survey questionnaire are analysed through the Statistical Package for Social Science (SPSS) and Smart PLS Version 3.0 while the qualitative data from the interview sessions conducted are analysed using thematic analysis.

Prior to analysing the responses gathered from the survey questionnaire, screening of responses is conducted. In the questionnaires distributed through Qualtrics, the researcher has adjusted to a setting whereby only fully filled responses from the secondary school teachers can be submitted. As such, there is no missing data from all the responses gathered. Screening of the responses is done wherein the internal functions of Qualtrics detect if the responses are not attempted appropriately, such as giving the same responses on all scales and items in the questionnaires. These responses are removed from analysis in Qualtrics as they do not show any significance, which may affect the findings of the study. As such, from a total of 454 responses gathered, only 406 responses were retained for data analysis purposes.

All secondary school teachers' responses from Qualtrics were imported to Smart PLS at the end of data screening. A total of two stages were employed in analysing the questionnaire responses. First, measurement model assessment is used wherein the indicator reliability, internal consistency reliability, convergent validity, and discriminant validity are referred in achieving the validity and reliability of the survey questionnaire. In the second stage, structural model assessment was used in which it is comprised of five different assessments, namely collinearity, path coefficient, coefficient of determination (R^2), effect size (f^2), and model's predictive relevance (Q^2). All results obtained are further presented in the next chapter.

For the interview responses, coding and thematic analyses were used. The data analysis process is conducted using ATLAS.ti, a software that is frequently used for qualitative data analysis (Lewis, 2016; Pandita et al., 2021). Atlas.ti offers numerous advantages, specifically it greatly reduces the time to analyse data from field notes and word processors, allows dynamic and emergent manner in analysing the qualitative data, and visualises the connections established between ideas analysed for easy interpretation (Lewis, 2016). To conduct the analysis, firstly, the coding process was divided into two stages: Open coding and axial coding. Open coding is the designation of any responses that the researcher deems appropriate in answering the research questions, and it was then followed by axial coding in which the researcher draws connections based on the responses identified in the open coding (Creswell, 2014; Merriam, 2009). Once the connections were made, these responses were used to form appropriate themes which serve to answer the research questions (Creswell, 2014; Merriam, 2009).

Thematic analysis is a widely used method in qualitative research wherein researchers report the themes identified from qualitative inquiries through identifying, categorising, classifying, organising, and describing the codes formed (Creswell, 2014; Creswell & Guetterman, 2019; Merriam, 2009; Nowell et al., 2017). Given the possible yet wide ranges of data from qualitative inquiries conducted, researchers who employ thematic analysis are able to effectively summarise the findings into easily interpretable and well-structured themes (Nowell et al., 2017).

Through the use of coding and thematic analyses, it helps in determining the specific benefits and challenges as perceived and encountered by the secondary school teachers during the adoption of GC for online learning, then the recommendations suggested by the teachers to improve the situation are also determined. Selective analysis was used, and it only reports major themes that yield many details and are significant in contributing to the research objectives of the study. As such, the three main themes that were identified are "benefits of using GC", "challenges of using GC" and "suggestions for improvement", these three themes are supported and explained by the subsequent sub-themes.

3.8 Structural Equation Modelling

Structural Equation Modelling, otherwise known as SEM is the main method used to conduct the research. SEM was first initiated by a biometrician, Wright (Kline, 2015; Tarka, 2018; Teo et al., 2013). In the past, Wright developed the SEM as a method for path analysis in his research on genetic theory in the field of biology (Teo et al., 2013) and later, this method is employed in the field of education to test hypotheses based on the latent and manifest variables further confirming the structure of theories being investigated. Regardless of field, manifest variables are referred as observable variables; latent variables refer to unobserved variables or factors (Tarka, 2018; Teo et al., 2013).

These variables must be firmly established to ensure hypotheses testing can be conducted (Tarka, 2018). Kline (2015) has made the criteria explicit to scholars when SEM is the choice of method: Inputs before using SEM must comprise of causal hypotheses, clear magnitude of relationships between variables, and data can be included for analysis regardless of experimental or non-experimental nature of the research. With clear criteria specified for the inputs needed in SEM, Kline (2015) also clarifies clearly the conditions needed to be fulfilled for outputs: logical implications can be derived from the data and these implications must be able to be supported by the data itself.

In social science, the data needed for SEM can typically come from the following, possible theories commonly employed such as aggression, alienation, anomie, attitudes, conservatism, frustrations, human behaviours, and personal fulfilment theories (Tarka, 2018). Unlike any other statistical methods employed in research, SEM is superior in such a way that it provides more than just any classical statistical methods which are often independently used, and the respective procedures are difficult to perform (Tarka, 2018; Teo et al., 2013). Teo et al. (2013) further argued that statistical methods such as regression analyses and multivariate analysis suggest possibilities where researchers might misinterpret the results due to high possibility of errors occurring, resulting in an incorrect drawing of conclusion for the research which is detrimental. The highly permissive nature of SEM which enables complicated, complex variables to be analysed altogether further provides an

opportunity to present precise information of the structure a theory is being analysed, drawing sufficient evidence from the hypotheses, inputs, and outputs (Tarka, 2018).

Hence, for SEM to occur, a researcher must first be able to define both manifest and latent variables of the theory interested in a concise manner, followed by establishing hypotheses and determine their nature whether they are meant for experimental or non- experimental research design, and use of appropriate methods to provide statistical analysis to achieve valid and reliable results (Eldeleklioglu & Yildiz, 2020; Kline, 2015; Tarka, 2018; Teo et al., 2013).

In this research then, the manifest (observe) variables are the variables previously identified in UTAUT 2, which are performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, habit, and behavioural intention to use as experienced by Malaysian secondary school teachers when adopting GC; latent variables are the suggestions given by the Malaysian secondary school teachers on better adoption of GC in lessons. The previous chapter has also identified the corresponding hypotheses needed to execute the study. As such, the conditions needed for SEM to be conducted are sufficiently met.

3.9 Ethical Considerations

Any professions contain an overall code of conduct that governs the ways of conducting research (Kumar, 2014). It is thus important to look into the ethical considerations and show concern to any stakeholders involve in the research. In research, stakeholders may refer to the research participants, the researcher, and the funding body (Kumar, 2014).

Most research in the field of social science often show ethical concerns on privacy, harm, data confidentiality, and consent (Punch, 2013). Prior to conducting the study, the research has sought ethical clearance from the university's board of ethics, UTAR Scientific and Ethical Review Committee (SERC). As the study involves public secondary schools, they are bound to the governance of the Ministry of Education Malaysia. As such, the researcher has also sought ethical clearance by submitting an application through the Educational Research Application System version 2.0 (eRAS 2.0). Further, in both questionnaires and interviews deployed when gathering data, all participants were required to show consent and declare they agree to participate prior to participating in the research, to which the researcher has prepared necessary sections and forms for them to indicate the agreement. All data obtained are bound to the Personal Data Protection Act 2010 that is in force since 2013.

3.10 Summary

Appropriate research methods from the research design implemented are keys in achieving the research objectives established in researching a phenomenon. This chapter has discussed extensively on the design, sampling methods, research instruments, data collection and analysis procedures, and validity and reliability of data obtained in pilot testing. The subsequent chapters thus report the findings from the pilot test conducted, results from the actual research conducted, and discussion of these findings in determining whether the research objectives, questions, and hypotheses are achieved.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter begins with the reporting of the findings gathered from the pilot test conducted. The findings from the pilot test serve to inform the reliability of the research instrument, specifically on the adapted questionnaire implemented. Further, this chapter looks into the findings obtained from the actual research conducted on secondary school teachers in Malaysia, from both quantitative and qualitative aspects. Appropriate figures and tables are displayed throughout the chapter to allow better visualisation of findings.

4.2 Findings from the Pilot Test Conducted

As stated, there are a total of 37 public secondary school teachers involved in the pilot test and this figure has met the minimum requirement for pilot study as stated by Creswell and Guetterman (2019), Fraser et al. (2018), and In (2017). The survey questionnaire is first validated by experts to ensure face validity is achieved and to ensure that the adapted survey questionnaire is appropriate for actual research.

Upon completing the pilot test, all responses were entered into the Statistical Package for Social Science (SPSS) Version 26 for data analysis. The

following sub-section reports the findings of the reliability of the research instrument.

4.2.1 Reliability Test

Table 4.1 displays the reliability of the pilot test conducted. A total of nine constructs: Performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, behavioural intention to use, behavioural intention to use, and use behaviour are included in the table, in which the corresponding reliability before and after modification of items are presented.

Table 4.1

Cronbach's Alpha Values Obtained from Pilot Test

Construct		Cronbach's Alpha n=37	Cronbach's Alpha After Modification of Item
Performance Expectancy	PE1 PE2 PE3 PE4 PE5	0.891	0.891 (all the 5 items are retained)
Effort Expectancy	EE1 EE2 EE3 EE4 EE5 EE6	0.909	**0.925** (EE3 is removed, 5 items are remained)
Social Influence	SI1 SI2 SI3 SI4 SI5	0.919	0.919 (all the 5 items are retained)
Facilitating Conditions	FC1 FC2 FC3 FC4	0.783	0.783 (all the 5 items are retained)

	FC5		
Hedonic Motivation	HM1	0.955	**0.953** (HM1 is removed, 5 items are remained) *
	HM2		
	HM3		
	HM4		
	HM5		
	HM6		
Price Value	PV1	0.921	**0.911** (PV6 is removed, 5 items are remained) *
	PV2		
	PV3		
	PV4		
	PV5		
	PV6		
Habit	HB1	0.944	0.944 (all the 5 items are retained)
	HB2		
	HB3		
	HB4		
	HB5		
Behavioural Intention to Use	BIU1	0.971	0.971 (all the 5 items are retained)
	BIU2		
	BIU3		
	BIU4		
	BIU5		
Use Behaviour	UB1	0.974	**0.973** (UB1 and UB6 are removed, 5 items are remained) *
	UB2		
	UB3		
	UB4		
	UB5		
	UB6		
	UB7		

Notes. *one item was removed from both HM and PV and two items were removed from UB to make the number of items in each construct consistent, and with the minimum changes to the Cronbach's Alpha value.

From the table, it can be seen that generally all the constructs have Cronbach's alpha of above 0.70 (range from 0.783-0.974) as indicated earlier in the minimum value to be shown as highly reliable (Creswell & Guetterman, 2019; Fraser et al., 2018; In, 2017). The rationale of removing the items comes with two reasons, in which it aims at raising the reliability of each construct and

maintain consistency of the way items are presented from each construct, where each construct would have five items in the actual survey questionnaire.

4.3 Findings from The Actual Research Conducted

As stated, there were a total of 406 public secondary school teachers involved in the actual research and this is achieved after data screening was done through Qualtrics. All responses are entered into both SPSS Version 26 and Smart PLS Version 3.0 for data analysis, in which the use of Smart PLS is a statistical software capable of providing effective results regardless of samples available (Acosta-Prado et al., 2020). To justify, the entries in SPSS are used to generate demographic findings and checking of the Cronbach Alpha's values, while Smart PLS is used to generate complex findings capable of answering the hypotheses posed. The following sub-section reports the findings obtained.

4.3.1 Demographic Findings from the Questionnaire

This section reports the demographic information of the public secondary school teachers who have responded to the questionnaire. The demographic findings include gender, age, location of school currently serving, years of teaching experience, and highest teaching qualifications. Figure 4.1 displays the gender of the secondary school teachers.

Figure 4.1

Gender of the Secondary School Teachers
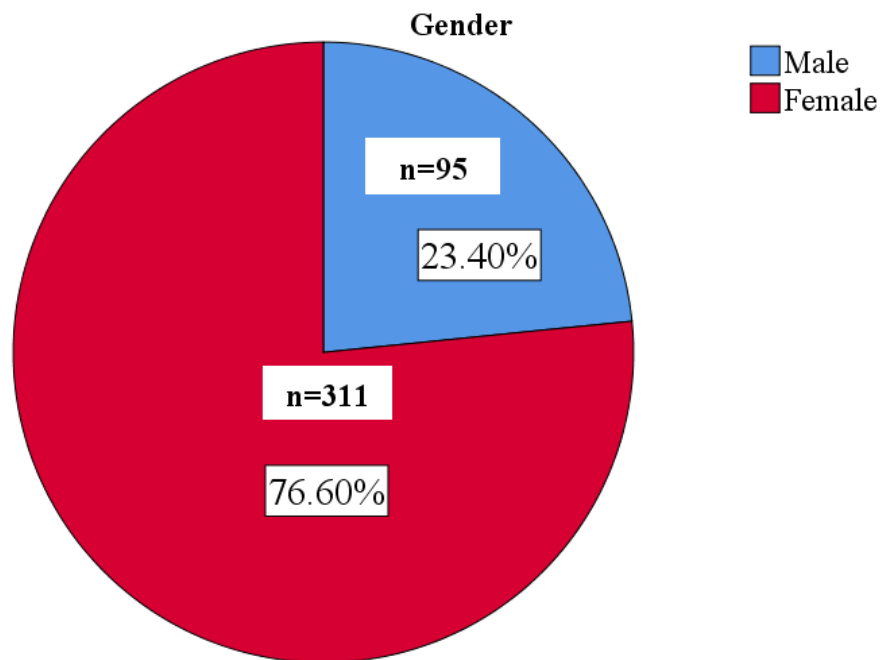
Gender

From the figure, it can be seen that the majority of the secondary school teachers are females, comprising 311 teachers and equivalent to 76.60%. Male teachers, however, are significantly lesser than female teachers, which is made up of 95 teachers only (23.40%).

Figure 4.2

Age of the Secondary School Teachers
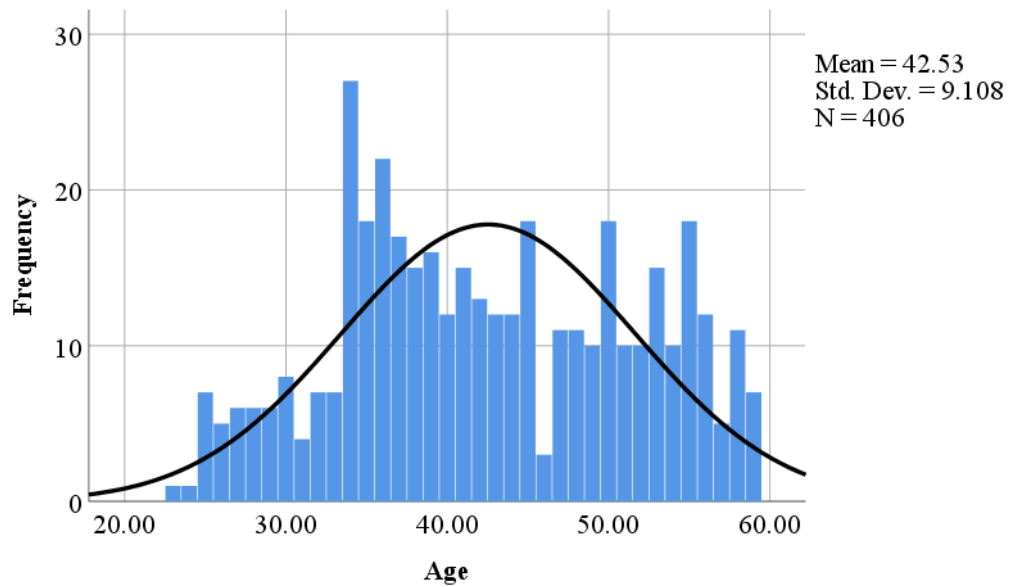
Figure 4.2 presents the age of the secondary school teachers who have participated in the questionnaire. A total of five different age categories are identified, in which 20 years old, 30 years old, 40 years old, 50 years old, and 60 years old respectively. On average, the mean age of the secondary school teachers is 42.53 or is estimated to be around 43 years old. However, in terms of mode, the highest frequency of age recorded is 34 years old.

Figure 4.3

Location of Schools Serving
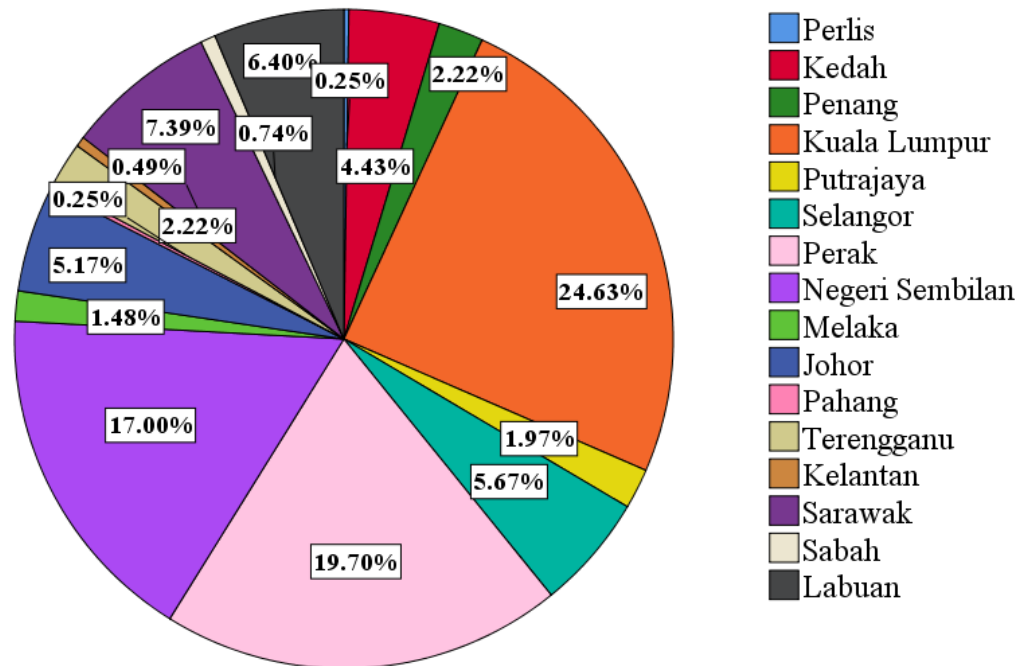
Figure 4.3 presents the location of schools where the secondary schools are currently serving. As previously stated, Malaysia is divided into East Malaysia and Peninsular Malaysia, further in Peninsular Malaysia, it is divided into four different regions: The Northern region, Southern region, East Coast region, and Central region (Goh & Foo, 2019). From the figure, it can be seen that majority of the secondary school teachers are currently serving in the federal territory of Kuala Lumpur (24.63%) while the least number recorded is in Perlis, which is only made up of 0.25%. Further, second after Kuala Lumpur is Perak, in which it stands a percentage of 19.78%; third in line is Negeri Sembilan, which is 17% of secondary school teachers.

Figure 4.4

Years of Teaching Experience
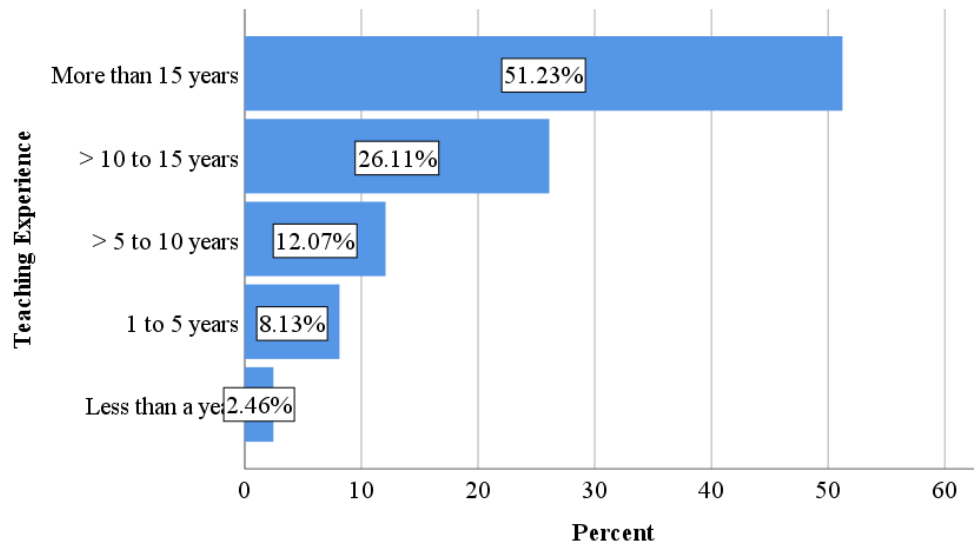
Figure 4.4 displays the years of teaching experience among the secondary school teachers who have responded to the questionnaire. A total of five categories are used in determining the years of teaching experience, (1) less than a year, (2) one to five years, (3) more than five to 10 years, (4) more than 10 to 15 years, and (5) more than 15 years. From the figure, it can be seen that the majority of the secondary school teachers (51.23%) have a teaching experience of more than 15 years while only 2.46% indicated that they have less than a year of teaching experience. It can also be observed that the horizontal bar graph gradually declines as the number of years decreases.

Figure 4.5

Highest Teaching Qualifications

Highest Teaching Qualifications
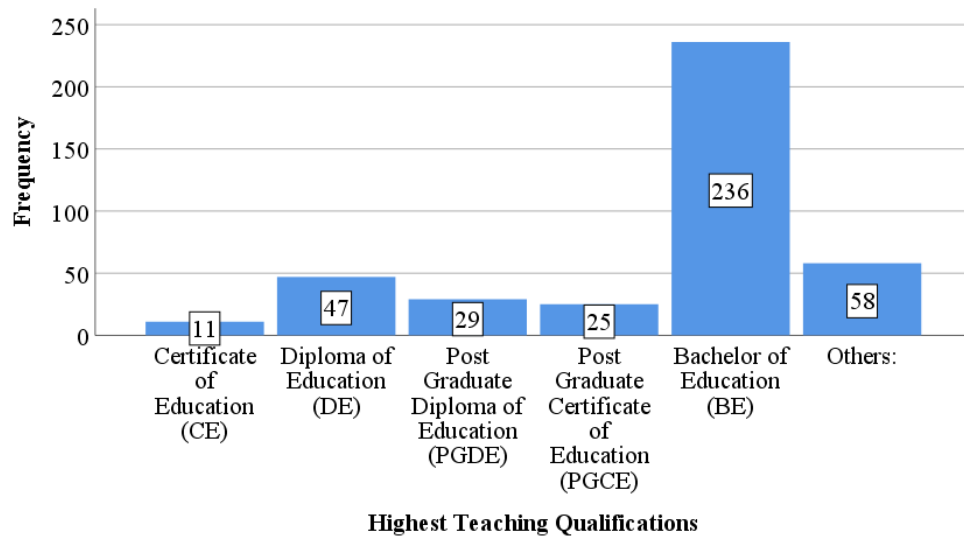
Finally, Figure 4.5 presents the highest teaching qualifications obtained among the 406 secondary school teachers who responded to the questionnaire. A total of six categories are identified, namely Certificate of Education, Diploma of Education, Post Graduate Diploma of Education, Post Graduate Certificate of Education, Bachelor of Education, and others. Evidently from the figure, it can be seen that among the 406 secondary school teachers, the majority of them have a qualification of Bachelor of Education (236 teachers, or equivalent to 58.13%). Second in line is the category of others (58 teachers or equivalent to 14.29%) in which these teachers may possibly obtained their qualifications from other means that are not recognised in the questionnaire or from other educational backgrounds that are not teaching related.

4.3.2 Quantitative Findings Obtained

As stated earlier, all 406 responses are entered as entries into Smart PLS Version 3.0 to perform complex statistical analysis in determining whether the established research questions are answered. Hair et al.'s (2014) steps on analysing the data in Smart PLS are referred to. The analysis process begins with determining the reliability and validity of the actual research findings which are discussed in the subsequent sections. Firstly, to determine the reliability of the survey questionnaire, the measurement model assessment is used in which it involves four different steps (Acosta-Prado et al., 2020; Hair et al., 2014): Step 1 involves determining the indicator reliability, ideally the outer loadings should be more than 0.708; Step 2 involves determining the internal consistency, ideally the composite reliability (CR) should be more than 0.70; Step 3 involves determining the convergent validity, in which the average variance extracted should be more than 0.50, and Step 4 involves determining the discriminant validity, wherein all Heterotrait-Monotrait ratio of correlations (HTMT) values should be lower than 0.90. Figure 4.6 displays the measurement model obtained from the data analysed.

Figure 4.6

The Measurement Model Displaying the Inner Model, Outer Model, and

Constructs
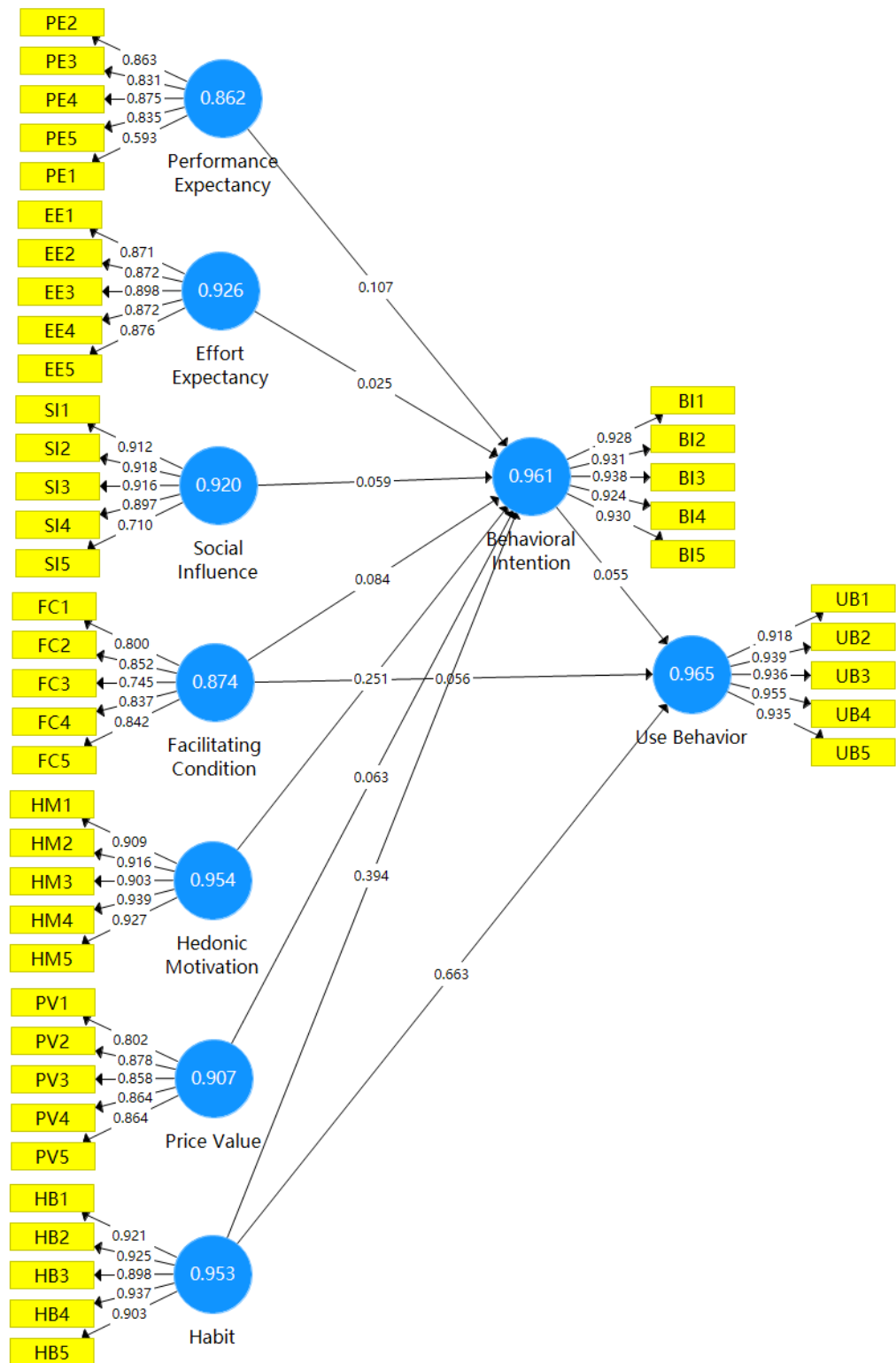
From Figure 4.6, it can be seen that the values of all variables, performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, behavioural intention, and use behaviour have values that meet the minimum values as stated in the measurement model assessment aforementioned. From the figure, a table is derived to indicate clearly the outer loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE) of each variable. However, PE1 is removed as its outer loading is 0.593, which is not significant where it should be greater than 0.708. Upon removing PE1, the remaining values become acceptable for the research. Table 4.2 displays the findings obtained from the reliability test performed.

Table 4.2

Reliability Test Performed

Construct	Item	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variable Extracted (AVE)
Performance Expectancy	PE2	0.85			
	PE3	0.84	0.88	0.92	0.74
	PE4	0.89			
	PE5	0.86			
Effort Expectancy	EE1	0.87			
	EE2	0.87	0.93	0.94	0.77
	EE3	0.90			
	EE4	0.87			
	EE5	0.88			
Social Influence	SI1	0.91			
	SI2	0.92	0.92	0.94	0.76
	SI3	0.92			
	SI4	0.90			
	SI5	0.71			
Facilitating Conditions	FC1	0.80			
	FC2	0.85	0.87	0.91	0.67
	FC3	0.74			
	FC4	0.84			
	FC5	0.84			
Hedonic Motivation	HM1	0.91			
	HM2	0.92	0.95	0.96	0.84
	HM3	0.90			
	HM4	0.94			
	HM5	0.93			
Price Value	PV1	0.80			
	PV2	0.88	0.91	0.93	0.73
	PV3	0.86			
	PV4	0.86			
	PV5	0.86			
Habit	HB1	0.92			
	HB2	0.93	0.95	0.96	0.84
	HB3	0.90			
	HB4	0.94			
	HB5	0.90			
Behavioural Intention	BI1	0.93			
	BI2	0.93	0.96	0.97	0.87
	BI3	0.94			
	BI4	0.92			
	BI5	0.93			
Use Behaviour	UB1	0.92			
	UB2	0.94	0.97	0.97	0.88
	UB3	0.94			
	UB4	0.95			
	UB5	0.93			

4.3.2.1 Internal Consistency Reliability

The internal consistency reliability is typically referred to the Cronbach's alpha, which is largely used as a reference to determine if the items are reliable for research purposes (Acosta-Prado et al., 2020; Hair et al., 2014). However, Hair et al. (2014) cautioned that merely relying on Cronbach's alpha does not provide enough evidence that the research instrument is reliable, as the scales employed may be affected by the scales' nature. As such, it is advisable to refer to the composite reliability in judging whether all items of the research instrument are indeed reliable (Hair et al., 2014). As the interpretation of the composite reliability is just as the same to the interpretation of Cronbach's alpha (Acosta-Prado et al., 2020; Hair et al., 2014), the interpretation of Cronbach's alpha as stated previously (see Heale & Twycross, 2015; Taber, 2018; Valim et al., 2015) is referred, wherein items that have values above 0.70 are considered as highly reliable.

From Table 4.2, it can be seen that from all nine variables, the corresponding Cronbach's alpha has values above 0.70, which clearly indicate that on surface value, the items are indeed reliable. From all the nine variables, use behaviour has a Cronbach's alpha of 0.97 which is the most reliable while facilitating conditions has a Cronbach's alpha of 0.87, which has the least value yet is still highly reliable.

By referring to the composite reliability of each variable, it can be seen that the values are somewhat different from the Cronbach's alpha. Unlike the

Cronbach's alpha of each variable that has alpha values between 0.87 and 0.97, the composite reliability of all variables is above 0.90, to which the highest composite reliability value is 0.97. With reference to the interpretation of Cronbach's alpha as provided earlier, the high composite reliability values thus serve as concrete evidence that all items are highly reliable and suitable in discussing the findings obtained to determine whether the research objectives are met.

4.3.2.2 Convergent Validity

Convergent reliability is a type of reliability that determines to what extent the measure employed shows positive correlation to the alternative measures, with condition that they are of the same construct (Hair et al., 2014). Determining whether convergent validity is present in the research instrument employed can simply be referred to the values in the average variance extracted, wherein the values, or outer loadings must be higher than 0.708 (Acosta-Prado et al., 2020; Hair et al., 2014). Further, when convergent validity is present, it also proves that indicator reliability exists (Acosta-Prado et al., 2020; Hair et al., 2014). Simply, the higher the outer loadings in AVE, the indicators or in this case, variables are more closely captured in the construct (Acosta-Prado et al., 2020; Hair et al., 2014).

By referring to Table 4.2, it can be seen that with the exception of facilitating conditions (AVE = 0.67), all remaining variables have AVE outer loadings that are higher than 0.708, which clearly indicates that both convergent

validity and indicator reliability do exist in the survey questionnaire and all constructs have achieved the reliability during the research conducted.

4.3.2.3 Discriminant Validity

When analysing the data, the discriminant validity is also determined wherein it intends to show to what extent a construct shows true distinction from other related constructs based on empirical standards (Acosta-Prado et al., 2020; Hair et al., 2014; Rönkkö & Cho, 2020). The purpose of having discriminant validity aims at distinguishing if the particular construct that is being used is capable of capturing a certain phenomenon that other constructs cannot achieve (Acosta-Prado et al., 2020; Hair et al., 2014; Rönkkö & Cho, 2020). To determine if discriminant validity is present, the Heterotrait-Monotrait ratio is referred and values should be lower than 0.90 (Acosta-Prado et al., 2020; Hair et al., 2014; Rönkkö & Cho, 2020). Table 4.3 displays the output of the Heterotrait-Monotrait Ratio performed. From the table, it can be seen that all values are generally lower than 0.90, and the only closest value to 0.90 is 0.86 for HB and BI, which means discriminant validity is present and the items are capable of capturing the phenomenon of secondary school teachers using GC in online lessons.

Table 4.3

Output of Heterotrait-Monotrait Ratio

	BI	EE	FC	HB	HM	PE	PV	SI	UB
BI									
EE	0.7								
FC	0.76	0.81							
HB	0.86	0.7	0.73						
HM	0.84	0.71	0.79	0.83					
PE	0.77	0.73	0.72	0.73	0.82				
PV	0.76	0.72	0.81	0.73	0.81	0.73			
SI	0.73	0.68	0.73	0.72	0.76	0.75	0.74		
UB	0.66	0.57	0.58	0.78	0.6	0.55	0.52	0.54	

To further determine the validity of the survey questionnaire adapted, structural model assessment is conducted. A total of five steps are involved when conducting the structural model assessment: Step 1 involves assessing the collinearity, in which the variance inflation factor should have values below 5.0; Step 2 involves assessing the path coefficients, where the t-value should be larger than the critical values, between 1.96 and 2.58 respectively, to be considered significant at a 5% confidence level; Step 3 looks into assessing the level of R^2 according to the interpretation provided by Cohen (1988); Step 4 looks into assessing the effect size, f^2; Step 5 assesses the model's predictive relevance in which Q^2 is greater than 0. Figure 4.7 displays the structural mode obtained from the analysis conducted.

Figure 4.7

The Structural Model: Inner Model and Constructs
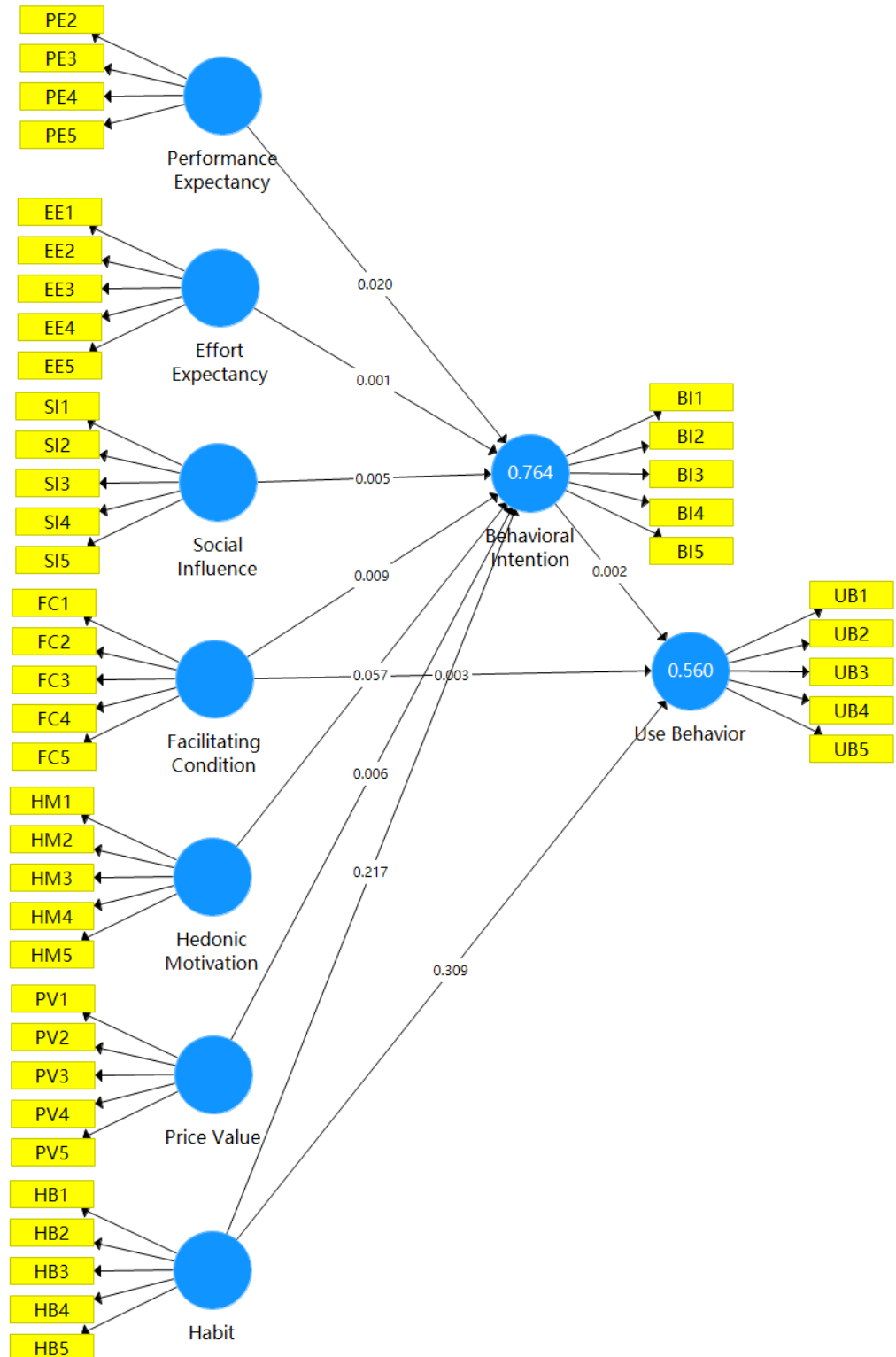
4.3.2.4 Collinearity

Collinearity refers to the extent at which variables are highly correlated, resulting in multicollinearity (Hair et al., 2014). Collinearity among variables may lead to severe impact on the findings as this unwanted correlation, especially when it happens among independent variables, would impede the actual findings generated on the dependent variable (Hair et al., 2014). When determining if collinearity is present among the variables, to which in this study the variables are BI, EE, FC, HB, HM, PE, PV, SI, and UB, the variance inflation factor (VIF) is commonly referred to. Accordingly, as long as the VIF values are below 5, no collinearity among the variables is detected. Referring to Table 4.4, all VIF values presented in the table have clearly indicated the non-presence of collinearity.

Table 4.4

Collinearity Statistics

	Behavioural Intention	**Use Behaviour**
Behavioural Intention		3.50
Effort Expectancy	2.66	
Facilitating Condition	3.06	2.08
Habit	3.08	3.23
Hedonic Motivation	4.44	
Performance Expectancy	2.76	
Price Value	2.97	
Social Influence	2.56	

4.3.2.5 Path Coefficients

The use of path coefficients in Smart PLS is to determine whether the indicators or variables converge, contribute, and show relationship to the model (Hair et al., 2014; Hussain et al., 2018). Generally, if the value is significant, it simply means that the hypothesised relationship exists within the same construct (Hair et al., 2014; Hussain et al., 2018). To assess the path coefficients, the t-values must be larger than all the critical values present, which is between 1.96 and 2.58; further, p-value must be significant at 5% or 0.05 to be considered as hypotheses being supported. At a bootstrapping of 5000 for hypotheses testing, Table 4.5 displays the results of the path coefficients performed.

Table 4.5

Path Coefficients

Hypotheses	Description	Beta Value	Standard Error	T-Value	P-Value	Decision
H1	**PE → BI**	**0.11**	**0.12**	**2.26**	**0.02**	**Supported**
H2	EE → BI	0.02	0.03	0.41	0.68	Not supported
H3	SI → BI	0.06	0.05	0.91	0.36	Not supported
H4	FC → BI	0.08	0.08	1.35	0.18	Not supported
H5	FC → UB	0.06	0.06	1.24	0.22	Not supported
H6	**HM → BI**	**0.24**	**0.24**	**3.62**	**0.00**	**Supported**
H7	PV → BI	0.07	0.07	1.35	0.18	Not supported
H8	**HB → BI**	**0.40**	**0.40**	**7.50**	**0.00**	**Supported**
H9	**HB → UB**	**0.66**	**0.66**	**11.54**	**0.00**	**Supported**
H10	BI → UB	0.05	0.05	0.85	0.40	Not supported

Evidently in Table 4.5, it can be seen that four out of the 10 hypotheses are found to be supported and shown to have a relationship among the variables. H1, H6, H8, and H9 are all significant at $p < 0.05$, and that all *t*-values are greater than the critical point established. As such, based on the research hypotheses established, it is thus valid that performance expectancy has a significant

influence on behavioural intention of using GC; hedonic motivation has a significant influence on behavioural intention of using GC; habit has a significant influence on behavioural intention to use GC, and habit has a significant influence on the use behaviour of GC.

4.3.2.6 Coefficient of Determination

Coefficient of determination or R^2 is defined as an evaluation of the structural model in determining the predictive accuracy of the variables (Hair et al., 2015; Hussain et al., 2018). In interpreting the R^2, the value should range between 0 and 1, in which the higher the level the more accurate its predictive capabilities on the variables in any research discipline (Hair et al., 2015; Hussain et al., 2018). Evidently in Table 4.6, the R^2 for behavioural intention is 0.764 and use behaviour is 0.560, which means that these two variables are highly predictable for research on the use of GC in online teaching.

Table 4.6

Determination of Co-efficient

Construct	R^2
Behavioural Intention	0.764
Use Behaviour	0.560

4.3.2.7 Effect Size

Upon determining the coefficient of determination (R^2), the effect size (f^2) is referred to determine whether if an omitted construct or variable would have an impact on the other constructs that are being used (Ghulami et al., 2014; Hair et al., 2015; Hussain et al., 2018). Simply, effect size is determined when multiple independent variables are present in the research (Ghulami et al., 2014). When assessing the effect size, the criteria can be based on Cohen's (1988 as cited in Hair et al., 2015) criteria, in which 0.02 is considered small, 0.15 is considered medium, and 0.35 is considered large. From Table 4.7, it can be seen that the effect of habit towards behavioural intention is at medium (0.22) while towards use behaviour is close to being large; hedonic motivation is almost considerable small (0.06) while maintaining its medium size effect towards behavioural intention; performance expectancy, however, is considered small towards behavioural intention since it has a value of 0.02.

Table 4.7

Determination of Effect Size

	Behavioural Intention	Use Behaviour
Behavioural Intention		0.00
Effort Expectancy	0.00	
Facilitating Condition	0.01	0.00
Habit	0.22	0.31
Hedonic Motivation	0.06	
Performance Expectancy	0.02	
Price Value	0.01	
Social Influence	0.01	

4.3.2.8 Model's Predictive Relevance

Finally, the model's predictive relevance (Q^2) is determined in which it involves investigating if data from variables accurately predict the constructs in the model being measured (Ghulami et al., 2014; Hair et al., 2015; Hussain et al., 2018). Generally, when interpreting the model's predictive relevance, Q^2 should be greater than 0 but the effect is interpreted as follows: small is equal to 0.02, medium is equal to 0.15, and large is equal to 0.35. As such, evidently in Table 4.8, being the dependent variables the behavioural intention (0.62) and use behaviour (0.47) have Q^2 values that are considered high enough in predicting the constructs used in the model, further proving that they are significant for research.

Table 4.8

Determination of Predictive Relevance

Construct	Original Sample
Behavioural Intention	0.62
Use Behaviour	0.47

The first objective in this study has sought to determine if performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, habit, and behavioural intention have a significant influence over the use of Google Classroom among secondary school teachers in Malaysia. By following the procedures outlined by Hair et al. (2014), 10 research hypotheses accounting each influence from the independent variable to the dependent variable are established. Through the determination of statistics performed in Smart PLS from the data entries obtained, findings have shown that performance expectancy, hedonic motivation, and habit significantly influence the behavioural intention and use behaviour of GC among the secondary school teachers. This thus proves that only three variables are found to have a strong predictive value among the secondary school teachers in using GC in classrooms.

4.4 Qualitative Findings Obtained

At the end of the questionnaire distributed through Qualtrics, teachers were allowed to leave their contact numbers for further interviews. Following the submission of the questionnaire, a total of 31 secondary school teachers are recruited from the 406 secondary school teachers for the telephone interview.

All interview sessions are conducted according to the interview protocol established, recorded and entered as entries in ATLAS.ti, and analysed descriptively on demographic information and thematically to generate the necessary themes.

4.4.1 Demographic Findings of the Secondary School Teachers

As previously discussed, the selection of secondary school teachers for telephone interviews is conducted based on whether the teachers leave their contact numbers in the questionnaire previously distributed. A total of 31 secondary school teachers have responded to the telephone interviews. The demographic information of these secondary school teachers, inclusive of gender, age, years of teaching experience, location of school serving, and subject currently teaching are presented.

Figure 4.8

Gender of the Secondary School Teachers
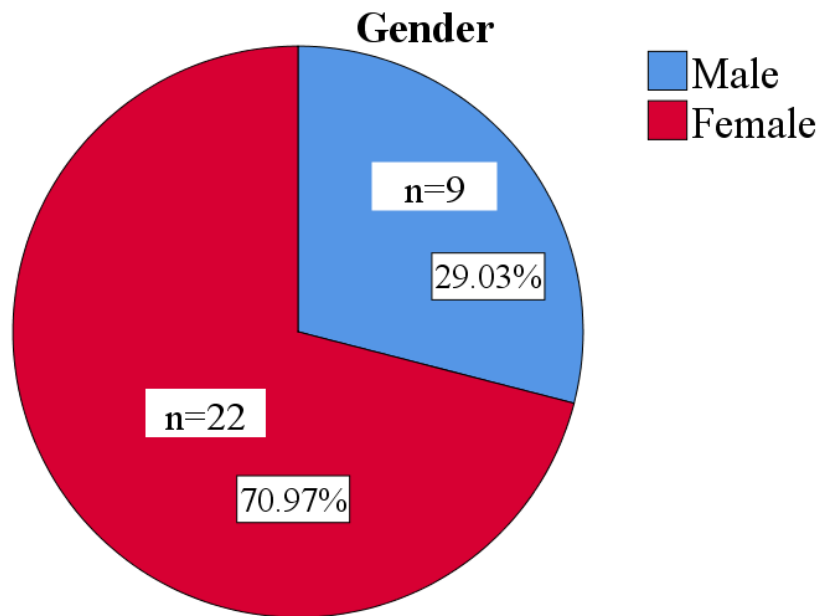
From Figure 4.8, it can be seen that even among the teachers who have opted for permission to be interviewed, the majority of these secondary school teachers are females, with a total of 22 female teachers (70.97%). The remaining nine teachers (29.03%) are male teachers who have participated in the telephone interview.

Figure 4.9

Age of the Secondary School Teachers
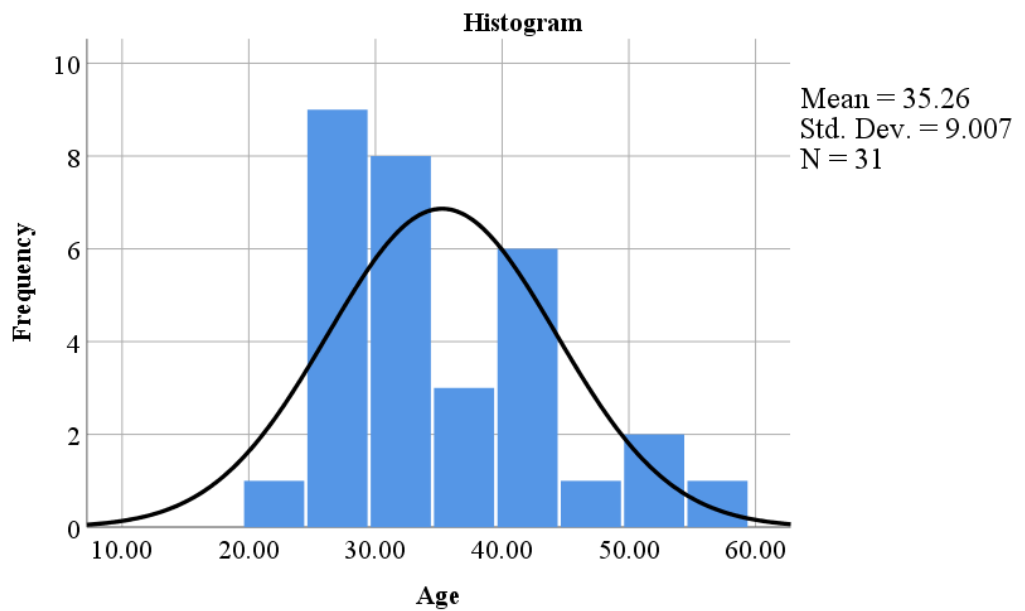
Figure 4.9 displays the age of the secondary school teachers who have participated in the telephone interviews. From the figure, it can be seen that more than half of the teachers were around 30 years old and nine of them were around 40 years old. On average, the teachers are about 35.26 years old.

Figure 4.10

Years of Teaching Experience

Figure 4.10 presents the years of teaching experience among the secondary school teachers. From the figure, it can be seen that there are two categories of years of teaching experience that both have the highest frequency of nine, which are "one to five years" and "more than 10 to 15 years". The least frequency obtained is one, whereby only one teacher has a teaching experience of less than a year.

Figure 4.11

Location of School Serving
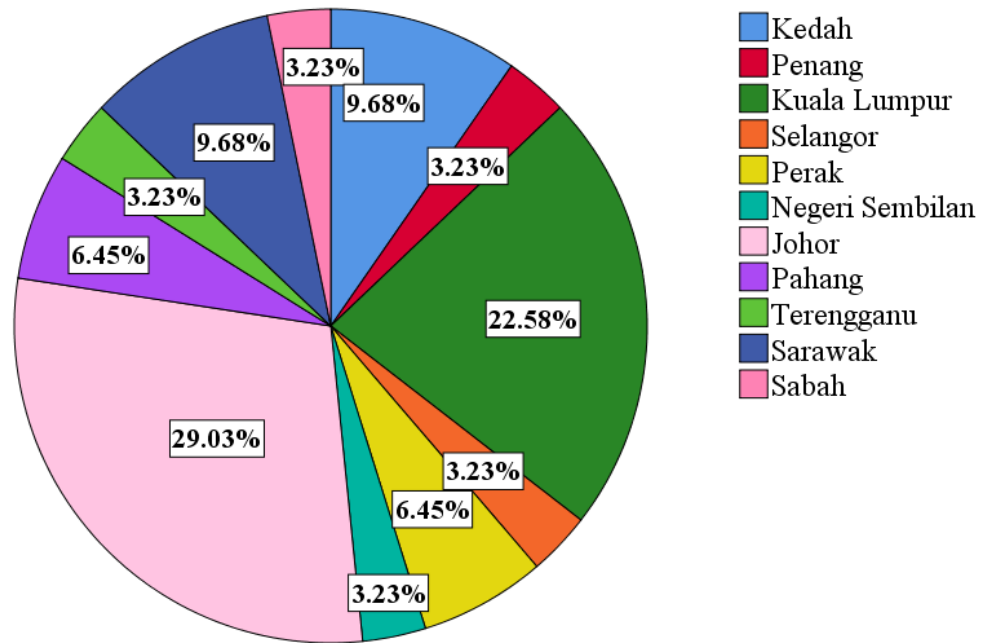
Figure 4.11 presents the location of schools the secondary school teachers are currently serving. Unlike the demographic findings from the questionnaire distributed wherein Kuala Lumpur has the highest percentage, teachers who have responded to the interview are largely form the state of Johor, with a percentage of 29.03%. Second in line is Kuala Lumpur where teachers who have taken part in the telephone interviews are 22.58%. The least percentage recorded is 3.23%, found in five different states: Terengganu, Sabah, Selangor, and Negeri Sembilan.

Figure 4.12

Subject Teaching
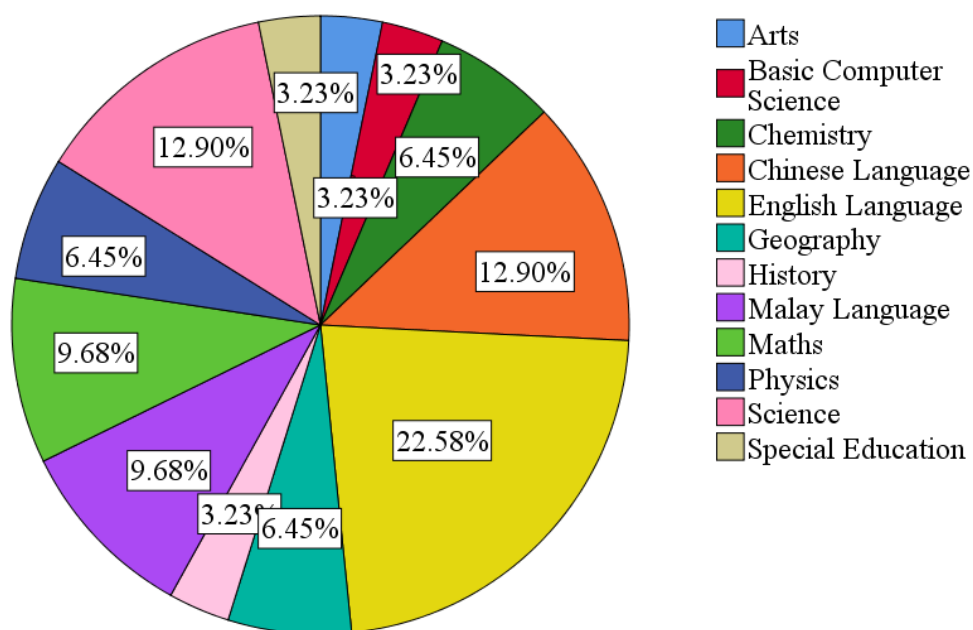
Finally, Figure 4.12 displays the subjects that are being taught by the secondary school teachers. From the figure, it can be seen that the majority of the teachers are teaching English Language subject (22.58%), which were followed by Chinese Language and Science subjects respectively (12.90%). The least percentage recorded is 3.23%, involving three subjects -Special Education, Basic Computer Science, and History respectively.

4.4.2 Themes Obtained from ATLAS.ti

The second and third research objectives seek to determine the benefits, challenges and suggestions of the Malaysian secondary school teachers towards the adoption of Google Classroom in schools. All secondary school teachers who have participated in the interview sessions were assigned to the corresponding pseudonyms using the following format: Respondent X, which X denotes the

number. By analysing all entries from the responses obtained in the telephone interview sessions, the networks of themes generated for the corresponding benefits, challenges, and suggestions are shown in the appendix (see Appendix O, P and Q). The following sub-sections look into the sub-themes obtained from the benefits of using GC, challenges of using GC, and suggestions towards using GC respectively.

4.4.2.1 Benefits of Using GC

There are a total of five sub-themes on the use of GC among the secondary school teachers, in which the benefits are (1) marking homework and giving feedback, (2) easy for assigning homework, (3) checking the progress of learning, homework, and setting reminders, (4) organise the learning materials and revise the contents, and (5) user-friendly.

Marking homework and giving feedback

Amongst the interview responses received, 27 of the secondary school teachers stated that using GC helps in marking homework and giving feedback. The word "marking" and "homework" is repetitively used as evident in the following quotations:

"I use GC to mark the students' work and grade the *homework*." (Respondent 8)

"…marking of the students' *homework*." (Respondent 16)

"…easy for marking and grading ***homework***." (Respondent 19)

Further, with reference to the homework, the secondary school teachers mentioned that they tend to mark the homework and provide feedback where necessary on Google Classroom. This is evident in the following quotations mentioned by the Respondent 2:

"And for those who finished, the teachers can mark them and after the marking, there will be a space for comments for the students. The ***feedback*** can be very important, it can be seen by not only the students, but also for the parents." (Respondent 2)

While Respondent 2 directly mentions the word "feedback' and sees it as crucial for the students, Respondent 2 further indicates how spaces are usually available to write feedback for the students. It can be seen that Respondent 2 would find places on the homework to allocate the feedback for students. Respondent 2 further explains how feedback is given by addressing the strengths and weaknesses of the student based on the performance seen.

"I think the best part of it (Google Classroom) is the feedback, the students will get to know their ***strengths and weaknesses*** by receiving the feedback or their homework or exercises. Even there are no face-to-face lessons, they will know what the ***feedback*** is." (Respondent 2).

While it is not directly stated, Respondent 25 and Respondent 30 also mention that feedback is given to the student through providing comments on Google Classroom as shown in the following quotations:

"Google Form was used for subjective questions, ***comment*** and grading… can get a summary of the grade." (Respondent 25)

"…marking and grading the assignment, put the ***comments*** and editing for the second time." (Respondent 30)

As previously discussed in the review of literature, Google Classroom enables users to access various types of applications managed by Google, and part of the applications is Google Forms. Clearly, the secondary school teachers know that homework can be assigned using Google-related applications and they are capable of providing feedback to the students through Google Classroom, especially in providing written feedback.

Easy for assigning homework

Among the interview responses received, 15 of the secondary school teachers have mentioned that GC is a platform convenient for them in assigning homework to the students. Related terms used for the word "homework" also include "assignment", "quizzes", "project", and "essays", to which by definition these are works that the students are expected to complete and submit in GC. The following highlights several quotations from teachers who acknowledged GC is a platform easy to assign homework:

"…*easy* to assign homework." (Respondents 19 & 28)

"…use GC *frequently*… (I) send exercises to the students *almost* every class." (Respondent 25)

"…*easy* to have *quizzes* for the students, …use "cam-scanner" to scan the work and use "Kami" to mark the answers." (Respondent 29)

"GC is a *good place* for the record and distribution homework for the students… it can let the teachers post announcements and also homework and learning materials (at) *anytime*" (Respondent 2)

While it is not directly stated of the word "easy", Respondents 2 and 25 have their responses that hinted towards the convenience of Google Classroom as a platform for teachers to assign homework to the students. In Respondent 25's response, the *frequent* use of Google Classroom to almost every lesson conducted strongly suggests that the teacher views GC as an easy platform for assigning homework; Respondent 2's mention of *good place* in distributing the homework to the students also strongly suggests GC is easy in distributing homework.

Checking the progress of learning, homework, and setting reminders

Another sub-theme obtained is the use of GC in checking the progress of learning, homework, and setting reminders. A total of 17 secondary school teachers have mentioned the similar topic during the interview sessions. The teachers' responses generally revolve around setting the reminders of submitting

homework to the students and monitoring their progress through GC. The following quotations display the secondary school teachers use GC as a method in reminding students to complete the work assigned:

"The first benefit is the *reminder* that can be set for the students, …the reminder or due date…" (Respondent 1)

"…easy for me to make an announcement or announcement in terms of some things like *reminder*." (Respondent 4)

"Google Calendar will also send *notifications* of the upcoming classes, convenient…" (Respondent 25)

While not directly stated, Respondent 25's mention of "notifications" is strongly associated to the word "reminder", as the manner in which Google Calendar notifies students about the upcoming classes is a form of providing reminder to the students about the event.

Further, other than reminding the students to complete the tasks assigned, teachers have found to associate reminding students to do tasks with checking the progress of the students. This can be found in the following quotations taken from the teachers interviewed:

"…can set topic and set due date… set schedule too… teachers can *check* the work in a more systematic way." (Respondent 27)

"…teacher can schedule the due date, and late submission(s) can also be *identified*." (Respondent 23)

"…easy to track the homework." (Respondent 12)

The above-mentioned quotations clearly indicated that teachers use GC as a platform in monitoring the students' progress when tasks are assigned. Accordingly, the teachers tend to set the time which is the due date to the students, and determine if there are any late submissions. In relation to this, Respondent 1 has provided how checking is done in a detailed manner as seen in the following quotation:

"…and if you remind the students, the students do it and hand in, the grading system will also *label* it as 'done late', so I will also know the students who have handed in the work *on time* and also the ones who done *late*." (Respondent 1)

Clearly, Google Classroom has a setting that informs if a student has handed the task assigned on schedule or overdue. The setting is managed by the teachers who schedule the timeframe to complete the tasks. From the quotations highlighted, it can be seen that teachers believe that they are able to monitor the students' performance on tasks assigned at all times given the functions that are available in Google Classroom.

Organise the learning materials and revise the contents

From the interview responses transcribed, nine secondary school teachers highlighted that they tend to use GC as a platform in organising the

learning materials and revising the contents for the students. Some quotations related to the theme are as shown in the following:

> "It is slightly ***organised*** where the students can revise or review whatever they have received." (Respondent 5)
>
> "…teachers can ***put*** teaching materials on GC (and allow students) to access the materials." (Respondent 20)
>
> "…help the teachers to ***manage*** the subjects and help the students to get to know what to learn." (Respondent 26)

While it can be seen that the teachers tend to put any materials in Google Classroom for students to access, in all the responses transcribed, it is unknown how teachers have specifically organised and managed the contents and materials in GC. Further, while teachers have mentioned that the stored materials in GC are used for revision, the manner in which revision sessions are conducted is also not explained but rather a mere mention.

User-friendly

Finally, another benefit identified in using GC among the secondary school teachers interviewed is the user-friendliness offered. Across the interview recordings transcribed, nine of the secondary school teachers have mentioned the same term, "user-friendly" in their responses. The following displays the quotations as mentioned by the teachers during the interview sessions:

"…it is ***user-friendly***." (Respondents 15, 23, and 26)

"…it is easy to use (and can be) accessed from all kinds of devices…

(it is) ***user-friendly*** (and) can catch up very easily." (Respondent 30)

Other than just mentioning the term "user-friendly", some teachers interviewed also explained how GC is user-friendly, as seen in the following quotations:

"…not taking the ***hardware storage***, stored in cloud… (and) without the constraint of ***time and place***." (Respondent 27)

"… (there is) no need to use (a) ***record book*** (as) GC can be used to submit lesson plans." (Respondent 29)

"…easy to use, (can) access from all kinds of ***devices***." (Respondent 30)

Evidently, the use of GC has allowed teachers to use the platform regardless of geographical and time aspects for work purposes. Further, GC is capable of being accessed from all devices, which means that the teachers do not necessarily need to have their laptops on hand at all times. These devices may be smartphones or tablets that are equally able to access GC. Teachers are also seemingly using GC to submit their lesson plans, while these lesson plans have no relation to the students, it helps teachers to submit lesson plans to the authority for assessing and informing them about the lessons conducted. Due to the variety of functions available, teachers are generally in consensus that GC offers a wide range of benefits, both for working purposes and lessons.

4.4.2.2 Challenges of Using Google Classroom

While there are benefits that teachers perceived they have obtained from using Google Classroom in conducting online lessons, the teachers have also mentioned that there are potential downsides to using GC as well. From the responses transcribed in Atlas.ti, there are a total of four sub-themes that are related to the challenges of using GC, which are (1) discipline and attitude problems, (2) having poor or no Internet connection, (3) insufficient IT literacy among the students, (4) passive students who are not responding, and (5) not having enough gadgets in the house.

Discipline and attitude problems

Amongst the responses received from the secondary school teachers, 27 of the 31 teachers interviewed have mentioned that they are faced with the challenge of students exhibiting discipline and attitude problems when it comes to conducting lessons in Google Classroom. The following presents the various discipline and attitude problems as acclaimed by the secondary school teachers:

> "The students cannot stay *focused*… you have to scold them then only they will look at the screen." (Respondent 6)
>
> "…not *obeying* the instructions…" (Respondent 12)
>
> "…students will give *excuses* to not join the class." (Respondent 16)
>
> "…some students don't want to do *homework*, seldom *login* into GC, …*simply answer* (the homework) and hand in…" (Respondent 27)

"…only half of the class handed in (the) homework." (Respondent 28)

"…some pupils are *not doing* their assignments, ask *someone else* to do the work… some just *ignore* the assignments." (Respondent 30)

Evidently, the cited problems often faced by teachers are that the students were making excuses of not joining lessons, refusing to complete the tasks assigned, and not paying attention in the lessons. These reasons are frequently mentioned in all 31 secondary school teachers. It should be noted that these are external challenges that are sometimes beyond the reach of the teachers as they are unable to directly discipline the students like physical lessons. Students seem to make use of the opportunity that teachers cannot reach them and thus are able to behave any ways that they wanted.

Poor or no Internet connection

Another emerging theme about the challenge in using GC is that teachers frequently mention the poor and have no Internet connection. From the 31 teachers who have interviewed, 19 of the secondary school teachers have mentioned this problem during the interview sessions. Generally, the responses given by the teachers are almost similar to each other as seen in the following quotations:

"(The) Internet connection, like *on and off*, sometimes good sometimes bad." (Respondent 2)

"Sometimes will not have enough *Internet connection*." (Respondent 9)

"Sometimes no *Internet connection*." (Respondent 12)

"Sometimes the Internet (is) not so good." (Respondent 6)

Some teachers have explained that the poor to no Internet connectivity is often a result of the rain or other weathers that affected it (Respondents 15, 21, and 29). Further, two of the teachers, Respondent 6 and Respondent 25 respectively, explained that the Internet problems often affect the students in lessons. Respondent 6 mentioned that when the Internet connectivity is poor, the entire lesson will be affected. As for Respondent 25, the teacher stated that the poor Internet connectivity has led to students unable to finish online tests administered. Evidently, initiatives must be taken to improve the current state of the Internet in the country.

Insufficient IT literacy among students

Another challenge that is frequently mentioned by the teachers is that students do not possess sufficient IT literacy. Among the 31 teachers interviewed, 13 teachers are not satisfied at the fact students are not capable of using technology for learning. Interestingly, many of the teachers cited that the students often forget their login identification names and passwords. The following shows some of the quotations of poor IT literacy highlighted by the secondary school teachers:

"…students will forget about the ***passwords***, (and) the admin has to reset the password." (Respondent 16)

"…students easily forget the ***passwords***." (Respondent 18)

"…students… forgot their ***password or IDs***." (Respondent 27)

"…students always forget (the) ***password***, (they) cannot log into GC." (Respondent 28)

Other than forgetting the IDs and passwords, teachers have highlighted several other problems related to the digital literacy that are occurring among the students. The following quotations show the issues highlighted:

"I am now teaching in the rural area, so most of the students… I won't say that they do not know how to use the computers, just they just seem like only know how to ***play games*** on computers." (Respondent 5)

"The other problem is they don't know how to ***upload the document*** – and in terms of ***computing skills***, they are not good at it." (Respondent 4)

Evidently, students' poor digital literacy also includes not knowing the methods of uploading documents, computing skills, and only resorting to use computers to play games. Arguably, initiatives must be taken to improve the current state of digital literacy among the students to ensure that they are able to learn in GC.

Unresponsive passive students

Across the interview sessions conducted, 11 teachers have mentioned that students are often passive and unresponsive in the online lessons conducted. Evidently, the word "passive" is frequently used in the teachers' responses as seen in the following quotations:

"…they are very ***passive***, yeah, not answering to your questions even (though) I already asked them for many times." (Respondent 4)

"Students' attitude… seldom give responses, very ***passive***." (Respondent 13)

"(The) students' attitude is very ***passive***." (Respondent 20)

"(The) students' behaviour are mostly ***passive*** and quiet." (Respondent 28)

Interestingly, one of the secondary school teachers, Respondent 7 attributed the occurrence of passive students as a result of the transition to online lessons, in which it is quoted that "As now (it) is more to a virtual school, there will be more passive students." As Malaysia enters the lockdown stage ever since the outbreak of COVID-19 pandemic in 2020, schools have become platforms for online lessons through the use of technology, such as Google Classroom. It can be inferred that since students do not need to face other people physically, they tend to become even silent and merely showing themselves as figures who are present in the lessons without actual interaction.

Insufficient gadgets at home

Finally, another sub-theme identified in relation to the challenges faced by the secondary school teachers is the insufficient gadgets possessed by students at home. The following presents the quotations from the teachers on the insufficient gadgets among the students:

"The ***shortage*** of gadgets, ***not enough*** gadgets to support all the children's online classes." (Respondent 3)

"Some of the students with ***poor*** family background ***cannot afford*** the gadgets." (Respondent 15)

"(students do) not have enough devices, have to ***share*** devices with the siblings." (Respondent 18)

"10% of the students ***don't have*** the devices." (Respondent 22)

"…***shortage*** of devices in a household… ***cannot afford***." (Respondent 27)

Evidently, these teachers have drawn experience on the interaction between them and the students. They realised that not all of their students possess sufficient gadgets to participate in online lessons. Among the reasons mentioned by these teachers are that some students are from poor family background or that they do not have enough devices where they have to share these devices among siblings.

In one of the teachers' responses, the teacher highlighted how a family with many children struggled greatly to attend online classes due to several reasons, as seen in the following quotation:

"…and because their family has more than one child with *special needs*, the tablets and computers will always in a need for *repair*, like the computers, the tablets, and their mother needs to go to work during morning, and she only leaves *a phone* with the children, and her children need to attend different classes at different or same time, and most of the children are having different teachers also…" (Respondent 2)

The access to education is greatly limited in this family where the children require special needs, gadgets that need to be frequently repaired, only one gadget is available at a time, and the many classes different children have to attend. All of these experiences greatly suggested that these families of many children are indeed suffering from the lack of gadgets to access Google Classroom for online learning. Drawing the quotations from all the teachers' responses, it simply indicates that aid must be given, especially in terms of providing necessary gadgets, to the students in accessing education.

4.4.2.3 Suggestions towards the Use of Google Classroom

Towards the end of the telephone interview sessions conducted, part of the interview questions also involves seeking the secondary school teachers' opinions on suggestions towards the use of Google Classroom in schools. A total of five sub-themes are obtained based on the findings presented in Atlas.ti, to which these themes are (1) improving Internet connectivity and providing more gadgets, (2) providing training in using Google Classroom, (3) developing its own gaming and learning applications, (4) improving host controls and functions, and (5) improving the digital literacy of both students and teachers.

Improve Internet connectivity and provide more gadgets

Amongst the 31 secondary school teachers interviewed, 20 of the school teachers mentioned the strong need in improving Internet connectivity and providing more gadgets to the students. The following quotations highlight the teachers' call in improving the Internet connectivity:

"Government should improve the ***Internet coverage*** and the ***speed***." (Respondent 22)

"…improve the ***Internet connection***." (Respondent 20)

"Government should improve on the ***Internet connectivity***… the ***coverage*** must be improved too." (Respondent 13)

"Improve the ***Internet*** as it is the main problem. Some teachers also face the Internet problem." (Respondent 9)

"Government should improve the ***Internet*** and provide ***free data*** for the students and teachers." (Respondent 24)

It can be seen that the teachers suggest that the government should improve the Internet available in at least two aspects, connectivity and coverage respectively as evident in the quotations. The suggestion on improving the state of the Internet is not limited to the teachers but also students as well as highlighted in the quotation from Respondent 24. Clearly, the Internet is a major issue to both teachers and students who are currently relying on Google Classroom to conduct and attend lessons.

Other than improving the Internet, teachers also mention that more gadgets must be made available for the students. The mention of gadgets is typically mentioned both before or after the suggestion on improving the Internet. Several quotations from the teachers are highlighted in the following as pieces of evidence:

"(The) government should improve the Internet connection and also ***provide devices*** to the students in need." (Respondent 28)

"The government can ask for ***sponsorship*** to provide ***computers*** for some students, (and) improve the Wi-Fi connectivity." (Respondent 10)

"(The) government should give ***laptops*** to the students." (Respondent 18)

> "The government (should) allocate a lot of ***money*** for our education…
> can you provide some ***laptop*** or something (like) ***tab*** for the students…
> with the latest version of Google Classroom." (Respondent 6)
>
> "MOE should make sure that sufficient ***gadgets and facilities*** have been
> provided to encourage the teaching and learning." (Respondent 29)

Teachers have called for the need to provide students with necessary gadgets, in which the specific examples of gadgets are computers, laptops, and tablets for the students to use. As highlighted by Respondent 10, a way to provide gadgets to the students is where the government may seek for sponsorship so that gadgets are made available. Respondent 6, on the other hand, suggested that the government should allocate more money for education purposes in schools. These responses are an echo towards the sub-theme of lacking gadgets among the students which is presented earlier. Evidently, gadgets do play an important role in providing education, especially in the context where the COVID-19 pandemic is still ongoing.

Provide training in using Google Classroom

Another sub-theme emerged among the suggestions given by the secondary school teachers interviewed are that training must be provided in terms of using Google Classroom. Among the 31 teachers interviewed, nine of them believed that teachers must receive necessary training to be proficient in using GC, as shown in the following quotations:

"The ***government*** should provide more ***training*** for the teachers to operate the software, …more facilitating for the teachers." (Respondent 9)

"They (***government***) must send the teachers to ***attend classes and learning*** about the GC." (Respondent 4)

"(The ***government***) needs to provide some sufficient ***training***, you know, the Ministry should send some experts to guide us." (Respondent 6)

"More exposure is needed for the teachers, …experts should provide ***training*** for the teacher… update from time to time." (Respondent 11)

"…need ***training*** for all the teachers as the teachers just know the basics…" (Respondent 30)

Evidently, the word "training" is frequently used by the secondary school teachers, with Respondents 4, 6, and 9 calling for the government to ensure that training is provided to the school teachers. However, unlike these respondents, Respondents 11 and 30 believe that experts in the area are a necessity in training teachers to use Google Classroom.

Google Classroom should come out with its own educational gaming applications

The third theme that emerged from the suggestions given by the secondary school teachers interviewed is that GC should come out with its own gaming and learning applications. Seven of the 31 teachers interviewed called

for the need to develop these applications in GC. Teachers have mentioned the word "games" and related words in their suggestions, as shown in the following quotations:

"If GC has its own quiz, its own *games* and its own exercises, it will help the teacher better. Once opening GC then everything will be there, there will be no need to attach something from here and there." (Respondent 2)

"The platform is not very interesting, so maybe they have to include more *gaming elements* to let the students engage more into the use of GC." (Respondent 3)

"The students can actually play the *games* at the same time while answering the questions." (Respondent 5)

"You know, History is very boring, right? The students can easily get bored, so if they can have *mini games*, or if I can draw other games from other websites and put in GC, you know it will be better." (Respondent 6)

The mentioning of having games in GC from the teachers shows that teachers acknowledge game-based learning is necessary to help in keeping the students interactive during the lessons. Teachers have mentioned that GC by itself is not interesting enough (Respondent 3) and subjects taught may also not be interesting, such as the History subject (Respondent 6). Further in the responses, it can be seen that teachers agree GC does not possess any functions related to gaming, and that they have to draw games from other applications into

GC, such as the example of quotation by Respondent 2 and Respondent 6. This means that if GC by itself, has gaming applications, it would ease the teachers in searching for other applications to initiate game-based learning.

Improve the host controls and functions

The fourth sub-theme from the suggestions given by the secondary school teachers is improving the host controls and functions, in which five teachers have mentioned about it. The quotations are as shown in the following:

"I think maybe Google Classroom should come out with the features that you have to force them to turn on the *camera*." (Respondent 4)

"Because some students will not turn on *cameras*, I think this is a problem that can be improved." (Respondent 1)

"Make the turning on of *webcams* a compulsory for the students, because some of the students really did not listen to the class." (Respondent 3)

"Make it more user-friendly and then make it more that I can control the students as well from that. Don't just let the students on already and then mute their mic and pretend that they're really listening but actually they really didn't." (Respondent 6)

Interestingly, four out of five teachers mentioned that GC can be improved especially in terms of the camera setting. They have mentioned that students are not turning on the cameras, which is highly suggestive that students

are playing truant by pretending they are present in GC but in reality, they are not. Students may use their account's presence in GC as an excuse and argument that they are indeed learning in GC, and when the camera is not switched on, teachers have no definite piece of evidence to claim that the students are not there. These quotations prove that GC has yet to have a function that makes camera switches on in a compulsory manner, further allowing students to show disciplinary problems that teachers are unable to control from their side. Clearly, this function must be improved.

Improve the digital literacy of both students and teachers

Finally, the last theme that emerged from the suggestions given by the teachers is to improve the digital literacy of both students and teachers. The teachers interviewed believe that they themselves along with the students do not have sufficient digital literacy and hence, must still be improved. The following quotations highlight the teachers' call in improving digital literacy:

> "(The) government should improve the ***digital literacy*** of the teachers." (Respondent 30)
>
> "…improve the ***digital literacy*** of the teachers and the students." (Respondent 16)
>
> "The students must be equipped with basic ***computer literacy*** whereby they know how to type in Microsoft Word or they know how to upload the documents onto GC." (Respondent 4)

"…improve the ***digital literacy*** of the teachers, some of them hate for the changes of mode in teaching." (Respondent 12)

From the quotations, it is evident that both teachers and students are in need in improving their digital literacy. As the teachers interviewed mention the need in improving digital literacy, they too explain the reasons on this need. These reasons include the need to use other platforms to produce work such as Microsoft Word (Respondent 4) and enable teachers to transition into online teaching (Respondent 12). Respondent 30's quotation is similar to the aforementioned theme about providing training to the teachers on the use of GC, wherein the government should be involved. It can thus be seen that the government again, plays an important role in improving the state of using technology further GC among teachers.

4.5 Summary

Findings from the pilot test conducted have revealed that the research instrument adapted, which is the questionnaire for the study, is highly reliable and suitable in achieving the research objectives established. Through the use of Smart PLS, Hair et al.'s (2014) steps of validating the data in measuring the construct and model are conducted, in which all results generated prove that the findings have indeed and sufficiently answered the research objectives and hypotheses established. Specifically, performance expectancy, hedonic motivation, and habit all have an influence on the behavioural intention and use behaviour among the secondary school teachers. These findings are further

validated and can be concluded that the first research objective is achieved successfully. In the thematic analysis performed in ATLAS.ti, the secondary school teachers have provided their responses towards the benefits, challenges, and suggestions to the use of Google Classroom, subsequently achieving the second and third research objectives. In the final chapter, a thorough discussion of the findings is made and is accompanied with relevant explanation on the implications of the study and recommendations for future research. An overall conclusion of the study is provided as well in the next chapter.

CHAPTER FIVE

DISCUSSION & CONCLUSION

5.1 Introduction

Due to the limited literature on the use of Google Classroom in Malaysian secondary education settings, accompanied by the lack of voice from teachers' view in using educational technology, and with the happening of the COVID-19 pandemic, this study has employed UTAUT 2 previously developed by Venkatesh et al. (2012) in determining the variables that affect use behaviour of secondary school teachers on the use of GC, the benefits and challenges faced by the teachers when using GC, and the suggestions provided by these teachers. In this chapter, findings from the data analysed are summarised and these are followed by extensive discussion by including evidence from the literature. Theoretical and practical implications are provided as well. Finally, limitations of conducting the study are addressed with recommendations for future studies are provided.

5.2 Summary of the Findings

A mixed method research design is implemented and through the use of two-phase sampling methods, a final total of 406 Malaysian public secondary school teachers participated in the study. Using Smart PLS Version 3.0 as the

main statistical program for data analysis, quantitative findings drawing Hair et al.'s (2014) steps of analysing data have proven that performance expectancy, hedonic motivation, and habit significantly influence the secondary school teachers' behavioural intention to use GC; habit also significantly influences the use behaviour of the secondary school teachers in using GC.

After distributing the questionnaires, telephone interview sessions adhering to the interview protocol established are conducted on 31 secondary school teachers. All interviews conducted are recorded, transcribed, and entered as entries into ATLAS.ti for thematic analysis. Concerning the three main themes, benefits of using GC, challenges faced when using GC, and suggestions on the use of GC, each comes with five sub-themes which are presented in the previous chapter. Drawing all findings obtained from both quantitative and qualitative data analyses, it can be argued that all three research objectives are successfully achieved.

5.3 Discussion of the Findings

This section serves to discuss the findings obtained from the data analysed. The following sub-sections discusses the findings obtained by including the literature reviewed as evidence and provide critical arguments to the findings presented.

5.3.1 Discussion on Quantitative Findings

The use of UTAUT 2 in determining technology acceptance among people has long begun since 2012 when Venkatesh and colleagues made further improvements on the founded theory, UTAUT (Azizi, 2020; El-Masri & Tarhini, 2017; Fard et al., 2016; Kuan et al., 2014; Moorthy et al., 2019; Raman & Don, 2013; Samsudeen et al., 2020).

As analysed, using the UTAUT 2 as the guiding theoretical model, it is found that performance expectancy, hedonic motivation, and habit showed significant influence over the secondary school teachers' behavioural intention to use GC. Further, habit also significantly influences the use behaviour of the secondary school teachers in using GC. To restate, performance expectancy refers to the degree of technology usage by people in order to receive benefits when performing activities; hedonic motivation refers to the enjoyment and preferences of using technology after experiencing it; habit refers to the tendency to perform a certain behaviour after using technology to perform activities (Azizi et al., 2020; El-Masri & Tarhini, 2017; Garone et al., 2019; Guggemos et al., 2020; Moorthy et al., 2019; Nistor et al., 2014; Raman & Don, 2013; Samsudeen et al., 2020), and behavioural intention refers to the degree of likelihood a person makes use of a certain technology or application (Fishbein & Ajzen, 1980).

When compared to the literature on past studies in Malaysia that have employed similar technology acceptance models, there are some similarities and differences detected. In Raman and Don's (2013) study, they found that the pre-

service teachers, in relation to the use of Moodle to carry out teaching and learning, exhibited that PE significantly influenced their BI. This is similar in the present study where PE is also found to be influenceable over secondary school teachers' BI in using GC. However, Raman and Don's (2013) study also found that EE had an influence on BI, unlike the present study where EE does not since it was found to be not significant ($p > 0.05$, $p = 0.68$). This means that both Moodle and GC are actually favoured by the teachers that they frequently use them for activities due to the benefits offered. As revealed in the interview responses, the secondary school teachers perceived GC as providing several benefits such as monitoring the students' progress, organising the learning materials, and reminding the students to complete the tasks assigned.

Next, while in this study HM is found to be significantly influencing secondary school teachers' BI on the use of GC, in Fard et al.'s (2016) study HM only showed an influence on purchase intention. As defined, hedonic motivation is a person's enjoyment and preference of using technology upon experiencing it. This may be a result of the teachers finding GC as having various benefits and as some of the teachers mentioned they have been frequently using GC in online lessons, they possess a high level of HM. Further, as GC is a free platform for both teachers and students, purchase intention is not listed as part of the variables in this study. It can also be traced back to the history of implementing Frog VLE and Smart School Project that met their ends in Malaysia, both forms of educational technology implemented in the country, though with the intention of transforming schools to meet Educational 4.0 and meeting the international standards of education, they are ultimately terminated (see Cheok et al., 2017;

Malaysian Ministry of Education, 2019b; Shen et al., 2017) while GC continues to be used. This means that GC, being the dominant educational platform, has more to offer than the aforementioned projects.

In this study, it is also found that habit has an influence on the secondary school teachers' behavioural intention in using GC. This is similar to the findings by Kuan et al. (2014), where they found that the participants' strong habit has influenced the behavioural intention to use mobile applications. In relation to habit, Venkatesh et al. (2012) explained that a habit is developed when the technology has enabled user to perform certain behaviours automatically. In this case, it is likely that due to the variety of benefits GC has to offer to the secondary school teachers, and along with the teachers' responses on the frequent use of GC in conducting online lessons, teachers have since developed a strong habit of using GC in online lessons amidst the COVID-19 pandemic.

Use behaviour refers to one's actual usage of technology (Venkatesh et al., 2012). In this study, the very first research objective seeks to determine if PE, EE, SI, FC, HM, PV, HB, and BI significantly influenced the use behaviour of the secondary school teachers on Google Classroom. Findings from the results indicated that among the 10 hypotheses investigated, four hypotheses were supported and have significant influence over Malaysian secondary school teachers' use of Google Classroom.

This subsequently means that, amongst the variables researched in this study, teachers' acceptance towards the use of GC in online learning is supported by H1, in which PE significantly influenced BI; H6, in which HM significantly influenced BI; H8, in which HB significantly influenced BI; and H9, in which HB significantly influenced UB of GC among the teachers. Evidently, there may be other non-existing factors that have affected the teachers' PE, EE, SI, FC, HM, and PV in using GC.

5.3.2 Discussion on Qualitative Findings

As stated, qualitative findings are presented as themes wherein the three main themes are the benefits, challenges, and suggestions towards the use of GC. Each theme comes with the respective sub-themes. These sub-themes are generated from ATLAS.ti where similar responses or keywords are grouped together accordingly with the number of respondents who stated the same thing. The themes are restated as follows:

Benefits of using Google Classroom

- Marking homework and giving feedback

- Easy for assigning homework

- Checking the progress of learning, homework, and setting reminders

- Organise the learning materials and revise the contents

- User-friendly

Challenges of using Google Classroom

- Discipline and attitude problems

- Poor or no Internet connection

- Insufficient IT literacy among students

- Unresponsive passive students

- Insufficient gadgets at home

Suggestions towards the use of Google Classroom

- Improve Internet connectivity and provide more gadgets

- Provide training in using Google Classroom

- Google Classroom should come out with its own educational gaming applications

- Improve the host controls and functions

- Improve the digital literacy of both students and teachers

5.3.2.1 Benefits as Perceived by the Teachers

In terms of benefits, the secondary school teachers have mentioned that GC enables them to mark and grade the students' homework. This finding is similar to Mafa's (2018) claim on the benefits of using GC, wherein teachers can mark the learning materials as submitted by the students. Mafa (2018) also mentioned that teachers can inquire on the students' performance based on the materials submitted in GC, in which this is similar to the theme of marking homework and giving feedback. As teachers inquire on the work submitted by

the students, they are able to provide feedback accordingly to the students. Further, Mafa (2018) has stated that GC enables users to conveniently share their thoughts. Due to this convenience, teachers are able to share the feedback of the students' work easily to them. However, it should be pointed out that none of the responses from the secondary school teachers clarify clearly in what manner feedback is given. This is because feedback can be given in oral or written manner, or both together. Further, as the response is from the teachers' perspectives, it is unsure if students have been constantly receiving feedback from the works they have submitted in GC.

Teachers have also responded to the ease of assigning homework to the students. The homework includes assignments, quizzes, projects, and essays as highlighted by the secondary school teachers. Since Google Classroom can integrate with several other Google-related applications like Google Docs and Google Forms (Liu & Chuang, 2016; Marinez-Monés et al., 2017), teachers are able to make use of these two applications in assigning students to write essays on Google Docs and complete quizzes on Google Forms. Further, teachers have reported frequently doing so in most classes on GC. Following the lockdown as a result of the COVID-19 pandemic (Mokhtar, 2020), the use of GC has greatly reduced the need for teachers to prepare piles of papers for the students to work on, thus effectively reducing unnecessary paperwork (Azhar & Iqbal, 2018). Arguably, by using GC, it helps in conserving the environment from further wastage.

Part of the benefits offered by GC is where teachers are able to manage the learning of the students (Azhar & Iqbal, 2018; Mafa, 2018; Shaharanee et al., 2016). From the responses of the secondary school teachers interviewed, they have found to be monitoring the students' progress with the various functions available in GC. Teachers are able to set the reminders based on schedule and they will be notified if the students have handed in the work assigned on time. Since GC allows integrating other Google-related applications like Google Calendar (Liu & Chuang, 2016; Marinez-Monés et al., 2017), teachers are able to fully utilise this Google Calendar in reminding the students to submit the homework.

Since teachers are able to organise and revise the learning materials in GC as responded by the secondary school teachers in the interview sessions, this has been proven as engaging into classroom engagement as stated by Azhar and Iqbal (2018) and Shaharanee et al. (2016). Given that teachers are able to access GC at any time (Mafa, 2018), these learning materials can be uploaded into GC conveniently regardless of geographical and time constraints.

In terms of user-friendliness, the teachers' responses include GC's capability of being accessible from all sorts of devices, saving the need for more storage, and not needing a record book for lesson planning. These responses are consistent with the literature, as GC is a free, cloud-based platform for everyone to use regardless of devices (Lin & Jou, 2013; Shinksy & Stevens, 2011; Vickers et al., 2015) and is paper-free (Azhar & Iqbal, 2018).

However, amongst all the benefits mentioned, neither of the secondary school teachers interviewed have stated anything about GC as a platform in promoting learner-centered learning. From the many studies reviewed, GC is a platform that greatly encourages users to interact with each other using several applications available, which this is supposed to stimulate students' higher-order thinking skills (Azhar & Iqbal, 2018; Shaharanee et al., 2016). Being a part of the LMS (Abazi-bexheti et al., 2018; Jakkaew & Hemrungrote, 2017; Kumar & Bervell, 2019) and its capability of using various Google-related functions (Liu & Chuang, 2016; Marinez-Monés et al., 2017), all themes from the aspect of benefits and as mentioned by these secondary school teachers are apparently teacher-based perspectives. This means that they are looking at how teachers are benefitted from the use of GC in online learning and not in terms of how they can deliver lessons effectively to the students, or at least moving on from a traditional, physical classroom learning environment into blended learning.

5.3.2.2 Challenges as Perceived by the Teachers

Throughout the interview sessions conducted, the secondary school teachers have reported to be facing a variety of challenges when using Google Classroom. These challenges include students' discipline and attitude problems, poor Internet connectivity, insufficient IT literacy among the students, unresponsive or passive students, and insufficient gadgets to be used.

Specifically in students' discipline and attitude problems, the secondary school teachers stated that students have not been following instructions, losing

attention in classrooms, refusing to complete works assigned, and to the extent of ignoring the works assigned. Further, many secondary school teachers also reported that students are largely passive in classrooms, where they hardly responded neither interacted with each other during the lesson. The situation of less interaction between teacher and student greatly contradicts with the benefit of technology promotes interaction among users as claimed in the literature (see Azhar & Iqbal, 2018; Gherhes et al., 2021; Lin & Jou, 2013; Liu & Chuang, 2016; Mafa 2018; Marinez-Monés et al., 2017; Shaharanee et al., 2016).

Given the teachers' experience, it can be seen that students do indeed have discipline and attitude problems. The use of online learning, while it has been claimed to be useful in literature, comes with the assumption that students are self-disciplined, controlled, and motivated in participating classes (Barrot et al., 2021; Gorbunovs et al., 2016). Even though teachers are largely responsible in ensuring students participate in online lessons (Azhar & Barrot et al., 2021; Gherhes et al., 2021; Mafa, 2018), students themselves are also the factors that contribute to successful online learning (Barrot et al., 2021; Gherhes et al., 2021; Gorbunovs et al., 2016). Barrot et al. (2021) mentioned that these attitudes and behaviours are a part of the psychosocial factors that are usually beyond the control of the teachers, what is more when the geographical location between teachers and students acts as a huge barrier in trying to have the students participate in online lessons. However, as this study did not look into the students' point of view in using GC, the extent of how teachers deliver lessons in GC from their point of view remains ambiguous.

Further, as the world is thrust into the COVID-19 pandemic and schools are informed to remain closed (Mokhtar, 2020), the Internet and corresponding gadgets have become a necessity and compulsory tool for students to engage into learning (Hussein et al., 2020; Mokhtar, 2020; Sri Priya, 2020; Tamin & Mohamad, 2020). As stated, GC is an online platform that also enables users to integrate several other functions from Google-related applications and even third-party applications into its platform (Liu & Chuang, 2016; Marinez-Monés et al., 2017), and this is not without the condition of having gadgets and stable Internet connection.

A recent finding from Ismail et al. (2020) has revealed that among 542 students in Malaysia who are participating online lessons, 430 of them (79.3%) raised the concern of Internet connectivity and 48 students (8.9%) were worried about lacking the necessary gadgets, especially laptops and computers to access online learning. A similar study from Barrot et al. (2021) in the Philippine context also highlighted that the students are worried about Internet connectivity and lack of gadgets to support themselves in accessing online learning. The Internet and corresponding gadgets then, are vital and essential in ensuring students are able to access education. The deprivation of any of these will directly result in failure to obtain education among students, in addition to creating a barrier that prevents students from accessing any forms of education while staying at home to avoid contracting the disease. In fact, one of the secondary school teachers interviewed even mentioned that some students they are teaching are from worrying backgrounds. This simply means that even though GC is beneficial for learning, it fails to account the students' background

in accessing GC. Barrot et al. (2021) with reference to their findings also quoted that online learning does not account the socio and economic background of the users, which resulted in those who are from poorer backgrounds to be deprived from accessing education, especially during the COVID-19 pandemic.

From the teachers' point of view, many of the challenges mentioned are attributed to the students themselves. They often mentioned that they are having a difficult time in providing education to the students due to the above-mentioned factors. Again, this study does not account for the students' perspectives on using GC. The extent to which teachers perceive students as being the problems can be challenged in terms of truth.

5.3.2.3 Suggestions towards the Use of Google Classroom by the Teachers

From the telephone interviews conducted with the secondary school teachers, Google Classroom is perceived to contain many benefits but also many challenges by the teachers. From the discussion of the themes earlier, almost all responses are teacher-centered, in which the extent of how GC has helped them to carry out their duties and responsibilities as teachers, and how the external factors (in this case, students, the Internet, and gadgets) have affected their work in delivering online lessons through GC. Interview sessions are followed up by seeking the teachers' suggestions towards the use of GC, which upon the completion of analysis, five themes are generated on these suggestions obtained.

First, since the sub-theme of Internet connectivity and access to gadgets is a challenge that is greatly highlighted by many of the teachers interviewed, the first sub-theme that immediately emerges from the suggestions given by the teachers is the need to improve Internet connectivity and provide more gadgets. As the COVID-19 continues to persist, the government has taken several initiatives in aiding the students to access learning, and provisions are given to those students especially whose background is categorised as B40 (Selvanathan et al., 2020). While unrelated, the government has also introduced and initiated the PRIHATIN Rakyat Economic Stimulus Package to the public, and students at large are benefited with a one-off payment of RM200.00 for learning (Shah et al., 2020). However, the one-off payment is limited to higher education students only and it is unknown what other provisions are provided to the secondary school students.

Yet, it should be noted the same package offers several other provisions for different households and people (Shah et al., 2020). Accordingly, in the PRIHATIN package, different ranges of one-off payment are given to the public based on the earnings of the family and/or individuals, to which one may receive an amount as high as RM1600 and as low as RM500. With the one-off payment available, families should be able to obtain some funds in getting Internet and gadgets for children to access education. Additionally, RM400 million is distributed to telco companies in upgrading broadband networks in the country. The challenge of poor Internet connectivity should be resolved with the funds given. Despite the efforts done, the concerns faced by teachers in this study

clearly indicated that such a situation remains present in the current society and the initiatives and provisions are still insufficient in resolving the problem.

Another suggestion that is mutually agreed by the teachers is that training should be provided to help teachers in using GC. This sub-theme may be connected to the theme of improving the digital literacy of both students and teachers, as training can be done to help them in becoming digitally literate. In an era where Educational 4.0 accompanied by educational technology is a dominant sphere in the field of education (Dunwill, 2016), followed by the introduction of e-learning in Malaysia that can be dated as far back to two decades (Malaysian Ministry of Education, 2005), it becomes an irony that in the present day many are still digitally illiterate, what is more amidst the COVID-19 pandemic crisis. Literature has long argued that training must constantly be provided to teachers in ensuring efficiency of delivering lessons to the students (Azman & Abdullah, 2021; Ismail et al., 2020). With sufficient training, teachers are able to sustain the quality of education delivered to the students even though there is a huge transition from traditional classrooms to virtual learning platforms (Azman & Abdullah, 2021). Yet, across the literature available, there is no specific module for training of teachers that is made available.

Another sub-theme emerged from the suggestions is the call for developers to include gaming applications in GC. From the responses of the teachers interviewed, they believe that some subjects may be boring, and students are not engaging in the lessons. In fact, a teacher even responded that

GC as a platform itself is rather boring. These responses strongly suggested that GC as a learning platform still has room for improvement, and that the call for games to be included in GC implies a need for game-based learning in classrooms.

Gaining its popularity over the years, game-based learning (GBL) is a form of learning where games are included in lessons to develop specific knowledge, skills, and values suitable to the subject matter (Stiller & Schworm, 2019; Ucus, 2015). The inclusion of GBL in lessons offers a wide range of benefits to the students, such as creating authentic learning experience, engaging into active learning, developing critical and problem-solving skills, motivating students into completing various challenging tasks, and offering a pleasant sense of accomplishment to the students (Stiller & Schworm, 2019; Ucus, 2015). Given the wide range of games on the Internet, it is crucial for teachers to select the games that are educational and tailor these games into those that meet educational goals (Stiller & Schworm, 2019; Ucus, 2015). As such, since GC has yet to create an interactive environment for the students as perceived by the teachers, developers of GC should account for the voices of the teachers and install games into the platform for a better learning environment.

Finally, other than the call for installing gaming applications in GC, teachers are generally in agreement that the present host controls and functions require improvements. From the responses gathered, teachers are in consensus that the camera function must be improved, as there are students who take advantage of the camera function to be virtually present but physically absent in

lessons. They have expressed hope that the camera function will remain turned on so that they are able to monitor the students on GC. Referring to the problem, not only the students' actions are a part of disciplinary problems as mentioned in one of the sub-themes of challenges earlier, but such challenges can also be considered as an external factor that is beyond the teachers' control in online lessons. Even though teachers must maintain themselves as authoritative figures in the classroom, if students themselves lack self-discipline, effective learning will not occur (Barrot et al., 2021; Gorbunovs et al., 2016). As such, to better manage the discipline of the students, developers may account for this issue and ensure that the cameras are adjusted appropriately for both teachers and students.

Evidently, from all the suggestions mentioned by the teachers, GC as an educational platform itself is yet a perfect platform for both teachers and students. While teachers generally do agree that GC has offered a wide range of benefits, challenges continue to remain existent when they are tasked to deliver lessons amidst the COVID-19 pandemic. Drawing the findings from both quantitative and qualitative inquiries and by placing them together, it can be seen that amidst the COVID-19 pandemic, teachers have developed the habit of using Google Classroom in conducting online lessons. Even though other variables (PE and HM) have a significant influence over BI only, these findings have proven that teachers do possess the intention in using GC for further online lessons. The benefits offered by GC have created personal preferences among teachers to have the intention of using GC in classrooms, seemingly more than Frog VLE and Smart School Project. As such, initiatives and actions must be taken in an

appropriate manner to address the concerns voiced by the secondary school teachers.

5.4 Implications of the Study

Findings from this study, without doubt, have contributed to shedding new lights on the literature of using Google Classroom among secondary school teachers in the Malaysian context. This section discusses the theoretical and practical implications of the study conducted.

5.4.1 Theoretical Implications

From a theoretical point of view, the findings have indeed proven that Venkatesh et al.'s (2012) UTAUT 2 is suitable in determining the acceptance of Google Classroom among Malaysian secondary school teachers. This is because among the many independent variables identified in UTAUT 2 and pertaining to the context where the study is conducted amidst the COVID-19 pandemic, performance expectancy, hedonic motivation, and habit still proved that teachers having the behavioural intention to use Google Classroom in delivering lessons. The findings from path coefficients with validation from other statistical tests performed in Smart PLS may still be insufficient in proving other variables having significant influence over use behaviour since the UTAUT2 has not been previously tested in the context of education amidst the pandemic.

5.4.2 Practical Implications

Findings from this study conducted also have several practical implications as well, not only on the teachers but also various parties involved at large. Firstly, due to the ease of using Google Classroom along with its useful and friendliness in developing, organising, marking, and monitoring students' homework, GC has been demonstrated as having a great potential to be continuously implemented in secondary schools throughout. Given the wide range of benefits offered by GC, training is indeed necessary as it is proven to be essential by scholars (see Azman & Abdullah, 2021; Ismail et al., 2020) that teachers with a high digital literacy can deliver a higher quality of lessons to the students using GC.

Without doubt, positive views of Google Classroom are also accompanied with its downsides, as teachers have been reporting that the poor Internet connectivity, lack of gadgets, and students' behaviours are factors impeding lessons from conducting smoothly in GC. Even though the PRIHATIN package was implemented, it does not seem to be efficiently helping the students as access to education is still limited to some students, as seen in the findings obtained from the interview sessions. The Ministry of Education Malaysia, being the governing ministry on all educational sectors in the country should account for these comprehensive findings and take initiatives in improving the current situation of accessing education.

As mentioned, part of the failure in successfully delivering online lessons may be attributed to students' poor management on their self-discipline, control, and motivation (see Barrot et al., 2021; Gorbunovs et al., 2016). While teachers have to continue in seeking ways to have students engage in online lessons, such as through the implementation of game-based learning as a way to motivate students in participating online lessons (see Stiller & Schworm, 2019; Ucus, 2015), parents of these students have to take initiative in ensuring students also contribute to ensuring the lesson's success.

Finally, at a school level, the school management and relevant stakeholders should understand that even though the government has implemented Google Classroom as the main educational platform in delivering lessons, and that GC is seemingly to offer a wide range of benefits, the school is still responsible in ensuring how online lessons can be improved from different angles: Training sessions and relevant manuals for both teachers and students in using GC can be conducted and developed respectively to enhance the efficiency of online lessons, and not assuming that it is a simple platform that everyone can understand intuitively. Further, policies of using Google Classroom amidst the COVID-19 pandemic should be constantly monitored, evaluated, and updated to ensure GC is appropriately implemented in schools.

5.5 Limitations and Recommendations for Future Studies

This study conducted however, is not without its limitations. Firstly, due to one of the problems identified wherein literature on the use of Google

Classroom among secondary schools is greatly limited, this study has sought to conduct the study in the secondary education context in Malaysia. Currently in Malaysia, three levels of education are available to the public, which are primary, secondary, and tertiary level. The current study has not focused on the primary education context and as such, a similar study employing UTAUT 2 can further shed light on how Google Classroom is being used from the primary school teachers' point of view. It should also be noted that, as the present study is now only one of the few literatures available that looks into the use of Google Classroom among secondary school teachers, more research is to be conducted in updating the existing literature.

Next, despite studies that have looked into the perception of students in using educational technology as highlighted in the literatures reviewed, and the existing findings from this study which have shed light from the teachers' point of view, all of these findings can be argued as being biased. This is because the studies are mainly one-sided, either focusing on students or teachers in each research conducted. As such, future studies should account for this possibility and conduct research involving both sides on technological acceptance. Further, comparisons can be made in determining the extent of truth given by both sides as well. As an example, while teachers in this study claimed that students' discipline and attitude have affected the teaching and learning process, it is not known whether this is true from the students' side, potentially leading to bias in findings. The comparisons made in future studies will thus validate these findings obtained in this study.

Finally, even though the UTAUT 2 that is developed by Venkatesh et al. (2012) looks into the acceptance of technology among users, given the current situation where education is now delivered through virtual and online platforms, further accompanied by the happening of the COVID-19 pandemic, it is still unknown whether UTAUT 2 is suitable and applicable to be employed in this context as the guiding theory in the research on technological acceptance. Future research should consider further validating the findings in terms of UTAUT 2, which not only strengthens the proponents of UTAUT 2 but also allowing it to be applicable in this context.

5.6 Summary

This chapter has looked into the discussion of the findings based on the study conducted on secondary school teachers. Following the discussions made and including relevant literature in explaining the findings, it can be concluded that all the three research objectives have been successfully met. Overall, while results are indeed positive where Google Classroom is highly applicable in schools amidst the COVID-19 pandemic, and that secondary school teachers do indeed show acceptance of Google Classroom in delivering online lessons, limitations do exist, and more studies should be done in improving the literature available on using Google Classroom.

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Survey Consent Form

Reference No. ⬚⬚⬚⬚⬚⬚

SURVEY CONSENT FORM

GOOGLE CLASSROOM: PERCEPTION AND ACCEPTANCE OF ONLINE LEARNING AMONG MALAYSIAN SECONDARY SCHOOL TEACHERS

You are invited to participate in this research. It is important that you understand why the research is being done and what it will involve. Please read the following information carefully. You may ask the researcher if you need further clarification.

A. PURPOSE OF THE STUDY
While Google Classroom has been perceived positively by the Ministry as capable of enabling teachers to facilitate, create, and organize homework, provide effective feedback, communicate students with ease, it is not definitive, yet that Google Classroom is indeed well-accepted by Malaysian teachers. Thus, this project seeks to examine the perception and acceptance of Malaysian secondary school teachers on the online learning platform – Google Classroom. With this questionnaire, we would like to find out how you and your peers think about Google Classroom when it comes to online teaching activities, and that is why you are chosen to participate in this study.

B. BENEFITS
We hope that this research will provide insights to the Ministry and also teachers on how they can better prepare themselves for online teaching environment and routines.

C. STUDY PROCEDURES
The target sample of this research project are secondary school teachers from both West and East Malaysia. The teachers' perception and acceptance of online learning will be examined from nine dimensions namely (i)performance expectancy, (ii) effort expectancy, (iii) social influence, (iv) facilitating condition, (v) hedonic motivation, (vi) price value, (vii) habit, (viii) behavioral intention to use and (ix) user behaviour.
The procedures of conducting the survey are listed as below:
- All participants of this research must be <u>secondary school teachers</u>.
- The informed consent form and questionnaire are distributed online to the teachers.
- The participants have read and agree to the informed consent form.

- The participants should ask the researcher when clarification or more information is needed.
- Participants who agree to participate in the research must <u>agree on the consent form</u> before proceeding to the questionnaire.
- The survey would take about 10 minutes.
- The participants are requested to <u>answer all the items in the questionnaire</u>.

D. CONFIDENTIALITY

All information that you have supplied will be kept confidential by the researchers and will not be made available to the public unless disclosure is required by the law. Data obtained from this research will not identify you individually. Your responses to this survey will be anonymous. Each questionnaire will be assigned code/reference number to ensure participants' information are not revealed.

E. CONTACT INFORMATION

If you have questions at any time about this study, you may contact the researcher as follows:

Researcher: Ms. Jacqueline Lau Chung Ling
Address: Universiti Tunku Abdul Rahman, Jalan Universiti, 31900 Kampar, Perak.
Phone No: 016 899-3130
Email: jacling96@1utar.my

F. VOLUNTARY PARTICIPATION

Participation in this study is voluntary and if you decide not to participate, you will experience no loss of benefits. If you decide to participate, you may subsequently change your mind and may stop participating in this study. By signing this consent form, you authorise the record review, publication and reutilisation of data and information.

G. DECLARATION AND CONSENT

I have read this consent form in the language understandable to me. I voluntarily consent and offer to take part in this study. By signing this consent form, I certify that all information I have given is true and correct to the best of my knowledge.

- **I AGREE to take part in this study**
- **I DO NOT AGREE to take part in this study**

Survey Questionnaire

QUESTIONNAIRE

Title of Study: **Google Classroom: Perception and Acceptance of Online Learning among Malaysian Secondary School Teachers**

Research Investigator: **Jacqueline Lau Chung Ling**

<u>Section A</u>
Instruction: Please provide your demographic details accordingly.

1. **Gender:** ☐ Male ☐ Female

2. **Age:** _____

3. **State:**

   -Northern Region: ☐ Perlis ☐ Kedah ☐ Penang ☐ Perak

   -Central Region: ☐ Kuala Lumpur ☐ Putrajaya ☐ Selangor

   -Southern Region: ☐ Negeri Sembilan ☐ Melaka ☐ Johor

   -East Coast Region: ☐ Pahang ☐ Terengganu ☐ Kelantan

   -East Malaysian Region: ☐ Sarawak ☐ Sabah ☐ Labuan

   District:

4. **Teaching Experience:**

   ☐ Less than a year   ☐ > 10 to 15 years

   ☐ 1 to 5 years   ☐ More than 15 years

   ☐ > 5 to 10 years

5. Form(s) and subject(s) that you are currently teaching

Please tick all that applies and fill in the subject(s) that you teach for that form(s), e.g., English & Science.

☐ Form 1, Subject (s):

☐ Form 2, Subject (s):

☐ Form 3, Subject (s):

☐ Form 4, Subject (s):

☐ Form 5, Subject (s):

6. Teaching Qualifications

☐ Certificate of Education (CE)

☐ Diploma of Education (DE)

☐ Post Graduate Diploma of Education (PGDE)

☐ Post Graduate Certificate of Education (PGCE)

☐ Bachelor of Education (BE)

☐ No Certificate/Others:

SECTION B

Instruction: Please circle <u>a number</u> from 1 to 5 to represent your perception of agreement for each statement below.

No.	Statement	Strongly Disagree				Strongly Agree
Performance Expectancy						
1.	I find Google Classroom useful for the work/teaching.	1	2	3	4	5
2.	Using Google Classroom increases my chances of achieving learning outcomes that are important.	1	2	3	4	5
3.	Using Google Classroom helps me accomplish tasks related to my work/teaching more quickly.	1	2	3	4	5
4.	Using Google Classroom increases my work/teaching productivity.	1	2	3	4	5
5.	Using Google Classroom enhances my interactions with students.	1	2	3	4	5
No.	Statement	Strongly Disagree				Strongly Agree
Effort Expectancy						
1.	Learning how to use Google Classroom is easy for me.	1	2	3	4	5
2.	My interaction with Google Classroom is clear.	1	2	3	4	5
3.	I find Google Classroom easy to use.	1	2	3	4	5
4.	It is easy for me to become skilful at using Google Classroom.	1	2	3	4	5
5.	It is easy for me to understand how to perform tasks using Google Classroom.	1	2	3	4	5
No.	Statement	Strongly Disagree				Strongly Agree
Social Influence						
1.	People who are important to me think I should use Google Classroom.	1	2	3	4	5
2.	People who influence my behaviour think that I should use Google Classroom.	1	2	3	4	5
3.	People whose opinions I value, prefer that I use Google Classroom.	1	2	3	4	5
4.	My peers think I should use Google Classroom.	1	2	3	4	5
5.	My school management encourages me to use Google Classroom.	1	2	3	4	5

No.	Statement	Strongly Disagree				Strongly Agree
Facilitating Condition						
1.	I have the necessary resources to use Google Classroom.	1	2	3	4	5
2.	I received guidance from others to use Google Classroom.	1	2	3	4	5
3.	Google Classroom is compatible with other technologies that I use (e.g., Google Meet, Google Doc, Google Calendar, DELIMa, Cikgootube, EduWebTV, Kahoot, Padlet).	1	2	3	4	5
4.	I can get help from others when I have difficulties using Google Classroom.	1	2	3	4	5
5.	When I encounter difficulties in using Google Classroom, I am given timely assistance (e.g., guidance, specialised instructions or technical personnel).	1	2	3	4	5
No.	Statement	Strongly Disagree				Strongly Agree
Hedonic Motivation						
1.	Using Google Classroom is enjoyable.	1	2	3	4	5
2.	Using Google Classroom is entertaining.	1	2	3	4	5
3.	I look forward to those aspects of my job that require the use of Google Classroom.	1	2	3	4	5
4.	Using Google Classroom gives me satisfaction.	1	2	3	4	5
5.	Using Google Classroom makes me to have the feeling of contentment.	1	2	3	4	5
No.	Statement	Strongly Disagree				Strongly Agree
Price Value						
1.	The Internet used for Google Classroom is reasonably priced.	1	2	3	4	5
2.	The online platform using Google Classroom during the pandemic is a good value for money.	1	2	3	4	5
3.	The gadget(s) that I used to access Google Classroom is reasonably priced.	1	2	3	4	5
4.	At the current practice, Google Classroom provides a good value.	1	2	3	4	5
5.	With the current amount of money that I have spent, Google Classroom provides a good value.	1	2	3	4	5
No.	Statement	Strongly Disagree				Strongly Agree
Habit						

No.	Statement	Strongly Disagree				Strongly Agree
1.	The use of Google Classroom has become a habit for me.	1	2	3	4	5
2.	I tend to regularly use Google Classroom.	1	2	3	4	5
3.	I must use Google Classroom.	1	2	3	4	5
4.	Using Google Classroom has become natural to me.	1	2	3	4	5
5.	I practically use Google Classroom for my work/teaching.	1	2	3	4	5
No.	Statement	Strongly Disagree				Strongly Agree
	Behavioral Intention to Use					
1.	I intend to continue using Google Classroom in the future.	1	2	3	4	5
2.	I will always try to use Google Classroom for my work/teaching.	1	2	3	4	5
3.	I plan to continue to use Google Classroom frequently.	1	2	3	4	5
4.	I'd love to use Google Classroom in my class.	1	2	3	4	5
5.	I expect that I would use Google Classroom frequently in the future.	1	2	3	4	5
No.	Statement	Never		Occasionally		Always
	User Behaviour					
1.	I use Google Classroom during the pandemic.	1	2	3	4	5
2.	I use Google Classroom for accessing the homework/assignments of my students.	1	2	3	4	5
3.	I use Google Classroom for uploading materials/posting announcements/posting homework.	1	2	3	4	5
4.	I use Google Classroom as a supporting tool for my work/teaching.	1	2	3	4	5
5.	I spend a lot of time on Google Classroom for my work/teaching.	1	2	3	4	5

Thank you for every second invested in this survey!

Please leave your email and/or contact number if you wish to be contacted for a more in-depth personal online interview regarding Google Classroom. Your identity and contact information will be kept confidential.

E-mail Address: _____

Contact No.: _____

Teacher Interview Consent Form

UNIVERSITI TUNKU ABDUL RAHMAN
FACULTY OF ARTS AND SOCIAL SCIENCE
MASTER OF PHILOSOPHY (SOCIAL SCIENCE)

TEACHER INTERVIEW CONSENT FORM

Title of Study: **Google Classroom: Perception and Acceptance of Online Learning among Malaysian Secondary School Teachers**

Research Investigator: **Jacqueline Lau Chung Ling**

RESEARCH PARTICIPANT'S NAME**:**

The purpose of this research is to examine the perception and acceptance of Malaysian secondary school teachers on the online learning platform – Google Classroom. The interview will take about 15 to 30 minutes. There are no risks anticipated that are associated with your participation, but you have the right to stop the interview or withdraw from the research at any time.

Thank you for agreeing to be interviewed as part of the above research project. Ethical procedures for academic research require interviewees to explicitly agree to being interviewed and know how the information contained in their interview will be used. This consent form is necessary to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. Please read the accompanying information sheet and then sign this form to certify that you approve the following:

- A transcript will be produced upon the completion of the interview and correction(s) can be made to the transcript.
- The transcript of the interview will be analysed by Jacqueline Lau Chung Ling as research investigator.
- Access to the interview transcript will be limited to Jacqueline Lau Chung Ling and the research team with whom she collaborates as part of the research process.

- Any summary interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized so that you cannot be identified.
- The content of your interview will be used to achieve the research objectives of the study.

By signing this form, I agree that;
1. I voluntarily take part in this research project. I understand that I can withdraw from the interview at any time without any reason;
2. The transcribed interview can be used as described above;

Participant's name: _____

Participant's signature: _____

Date: _____

Researcher's signature: _____

Date: _____

Contact information

If you have any further questions or concerns about this research, please contact:

      Name of Researcher: Jacqueline Lau Chung Ling
      Telephone Number: 016-8993130
      E-mail: jacling96@1utar.my

Appendix D

List of Interview Questions

A. Demographic information:

1.   Gender, Age (May I know your age?)
2.   Which area is the school that you are teaching now?
3.   How long have you been teaching in this school?
4.   How long is your teaching experience?
5.   What level (or form) and which subjects do you teach?

B. Benefits:

1. Does Google Classroom offer any benefits to you?
2. What are the benefits that Google Classroom brings to you?
3. Do you think the students also get the benefits of using Google Classroom? (If yes, what are the benefits?)
4. Among all the benefits that you have mentioned, what is the most significant benefit in your opinion? Why?

C. Challenges:

1. Do you encounter any challenges (or difficulties) while using Google Classroom?
2.What kind of challenges have you encountered during online teaching using Google Classroom?
3. Apart from Google Classroom, did you encounter any challenges from other aspects of your teaching routine? (e.g., from the colleagues, parents or students)
4. Among all the challenges and difficulties that you have mentioned, what is the most difficult challenge (or the primary challenge) in your opinion? Why?

D. Suggestions:

1. Do you think Google Classroom is improving throughout the time you are using it as an online teaching and learning platform? What are the improvements that you have observed?
2.Do you have any suggestions on improving the teaching and learning experience using Google Classroom?
3.In your opinion, what can the government do to improve the current situation of online teaching and learning in our country?

Appendix E

Ethical Clearance Approval from University

UNIVERSITI TUNKU ABDUL RAHMAN

Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/109/2021

28 May 2021

Dr Priscilla a/p Moses
Department of General Studies
Faculty of Creative Industries
Universiti Tunku Abdul Rahman
Jalan Sungai Long
Bandar Sungai Long
43000 Kajang, Selangor

Dear Dr Priscilla,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under Expedited Review.

The details of your research project are as follows:

Research Title	Google Classroom: Perception and Acceptance of Online Learning Among Malaysian Secondary School Teachers
Investigator(s)	Dr Priscilla a/p Moses Dr Cheah Phaik Kin Ms Kristina Francis Jacqueline Lau Chung Ling (UTAR Postgraduate Student)
Research Area	Social Sciences
Research Location	Malaysia
No of Participants	384 participants (Age: 20 and above)
Research Costs	UTAR Research Fund 2019 Cycle 2
Approval Validity	28 May 2021 - 27 May 2022

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research,

(2) Confidentiality of participants' personal data must be maintained,

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines; and

(4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

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Appendix F

Approval Letter from the Malaysian Ministry of Education

KEMENTERIAN PENDIDIKAN MALAYSIA
BAHAGIAN PERANCANGAN DAN PENYELIDIKAN DASAR PENDIDIKAN
ARAS 1-4, BLOK E8
KOMPLEKS KERAJAAN PARCEL E
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62604 PUTRAJAYA

TEL : 0388846591
FAKS : 0388846579

Ruj. Kami : KPM.600-3/2/3-eras(10008)
Tarikh : 5 Jun 2021

JACQUELINE LAU CHUNG LING
NO. KP : 960418136158

2371, JALAN SEKSYEN 2/10, TAMAN BANDAR BARU BARAT, KAMPAR
31900 KAMPAR
PERAK

Tuan,

KELULUSAN BERSYARAT UNTUK MENJALANKAN KAJIAN :
GOOGLE CLASSROOM: PERCEPTION AND ACCEPTANCE OF ONLINE LEARNING AMONG MALAYSIAN SECONDARY
SCHOOL TEACHERS

Perkara di atas adalah dirujuk.

2.   Sukacita dimaklumkan bahawa permohonan tuan untuk menjalankan kajian seperti di bawah telah diluluskan dengan syarat :

   " PENGUTIPAN DATA TERMASUK SECARA DALAM TALIAN (CONTOH: GOOGLE FORM) PERLU MENDAPATKAN
   KEBENARAN PENGARAH JPN DAN PERTIMBANGAN PENTADBIR SEKOLAH. "

3.   Kelulusan adalah berdasarkan kepada kertas cadangan penyelidikan dan instrumen kajian yang dikemukakan oleh tuan kepada bahagian ini. Walau bagaimanapun kelulusan ini bergantung kepada kebenaran Jabatan Pendidikan Negeri dan Pengetua / Guru Besar yang berkenaan.

4.   Surat kelulusan ini sah digunakan bermula dari **7 Jun 2021** hingga **30 November 2021**

5.   Tuan dikehendaki menyerahkan senaskhah laporan akhir kajian dalam bentuk *hardcopy* bersama salinan *softcopy* berformat pdf dalam CD kepada Bahagian ini. Tuan juga diingatkan supaya mendapat kebenaran terlebih dahulu daripada Bahagian ini sekiranya sebahagian atau sepenuhnya dapatan kajian tersebut hendak diterbitkan di mana-mana forum, seminar atau diumumkan kepada media massa.

Sekian untuk makluman dan tindakan tuan selanjutnya. Terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

Ketua Penolong Pengarah Kanan
Sektor Penyelidikan dan Penilaian Dasar
b.p. Pengarah
Bahagian Perancangan dan Penyelidikan Dasar Pendidikan
Kementerian Pendidikan Malaysia

salinan kepada:-

JABATAN PENDIDIKAN JOHOR
JABATAN PENDIDIKAN KEDAH
JABATAN PENDIDIKAN KELANTAN
JABATAN PENDIDIKAN MELAKA
JABATAN PENDIDIKAN NEGERI SEMBILAN
JABATAN PENDIDIKAN PAHANG
JABATAN PENDIDIKAN PULAU PINANG
JABATAN PENDIDIKAN PERAK

JABATAN PENDIDIKAN PERLIS
JABATAN PENDIDIKAN SELANGOR
JABATAN PENDIDIKAN TERENGGANU
JABATAN PENDIDIKAN SABAH
JABATAN PENDIDIKAN SARAWAK
JABATAN PENDIDIKAN WILAYAH PERSEKUTUAN KUALA LUMPUR
JABATAN PENDIDIKAN WILAYAH PERSEKUTUAN LABUAN
JABATAN PENDIDIKAN WILAYAH PERSEKUTUAN PUTRAJAYA

* SURAT INI DIJANA OLEH KOMPUTER DAN TIADA TANDATANGAN DIPERLUKAN *

Appendix G

Sample A of Approval Letters from the Department of Education (all the

states of Malaysia)

KEMENTERIAN PENDIDIKAN MALAYSIA
Jabatan Pendidikan Negeri Sembilan
Jalan Dato' Hamzah,
Karung Berkunci No. 6,
70990 Seremban,
Negeri Sembilan Darul Khusus.

Tel   : 06-7653100
Faks   : 06-7639969
Laman Web : jpnns.moe.gov.my

Ruj. Kami : JPNS.SPS.MTE.500-12/4 Jld.2(90)
Tarikh   : 20 OGOS 2021

JACQUELINE LAU CHUNG LING
NO. KP : 960418136158

2371, JALAN SEKSYEN 2/10
TAMAN BANDAR BARU BARAT
31900 KAMPAR
PERAK

Tuan,

KEBENARAN BERSYARAT UNTUK MENJALANKAN KAJIAN KE SEKOLAH MENENGAH DI NEGERI SEMBILAN DARUL KHUSUS DI BAWAH KEMENTERIAN PENDIDIKAN MALAYSIA

Saya dengan segala hormatnya memaklumkan bahawa permohonan tuan untuk menjalankan kajian bertajuk: *"GOOGLE CLASSROOM:PERCEPTION AND ACCEPTANCE OF ONLINE LEARNING AMONG MALAYSIAN SECONDARY SCHOOL TEACHERS"* telah diluluskan dengan syarat:

"PENGUTIPAN DATA TERMASUK SECARA DALAM TALIAN (CONTOH:GOOGLE FORM) PERLU MENDAPATKAN KEBENARAN DAN PERTIMBANGAN PENTADBIR SEKOLAH."

2.   Tuan hendaklah menghubungi dengan Pengetua sekolah berkenaan untuk meminta persetujuan dan membincangkan kajian tersebut di tempat seperti berikut:

     i.   **SEKOLAH MENENGAH DI NEGERI SEMBILAN**

3.   Dimaklumkan bahawa kebenaran ini diberikan berdasarkan surat kelulusan dari pihak Kementerian Pendidikan Malaysia, Bahagian Perancangan Dan Penyelidikan Dasar Pendidikan, nombor rujukan KPM.600-3/2/3-eras (10008) bertarikh 5 Jun 2021 dan **sah digunakan bermula dari 7 Jun 2021 hingga 30 November 2021.**

4.   Tuan hendaklah menghantar satu naskah hasil kajian dalam bentuk *hardcopy* bersama salinan *softcopy* berformat Pdf di dalam CD ke Jabatan Pendidikan Negeri Sembilan (u.p : Unit Menengah dan Tingkatan Enam).

Sekian untuk makluman dan tindakan tuan selanjutnya. Terima kasih.

"WAWASAN KEMAKMURAN BERSAMA 2030"
"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

(MOHAMAD ZAIDI BIN ISHAK PMC)
Timbalan Pengarah Pendidikan
Sektor Perancangan dan Pengurusan PPD
b.p Pengarah Pendidikan
Jabatan Pendidikan Negeri Sembilan

Nota :- Sila beri satu salinan surat kelulusan semasa membuat kajian di sekolah

Appendix H

Sample B of Approval Letters from the Department of Education (all the states of Malaysia)

KEMENTERIAN PENDIDIKAN MALAYSIA
Jabatan Pendidikan Negeri Sarawak
Jalan Diplomatik Off Jalan Bako
Petra Jaya
93050 Kuching, Sarawak

Tel : 082-473473
Faks : 082-473478
Portal Rasmi : jpnsarawak.moe.gov.my
E-mel : jpn.sarawak@moe.gov.my

Ruj. Kami : JPNSW.SKPP.LAT.600-1/1/1 Jld.12 (4l)
Tarikh : 27 September 2021

JACQUELINE LAU CHUNG LING

2371, JALAN SEKSYEN 2/10
TAMAN BANDAR BARU BARAT
31900 KAMPAR, PERAK

Tuan,

KEBENARAN UNTUK MENJALANKAN KAJIAN DI SEKOLAH-SEKOLAH, INSTITUT-INSTITUT PERGURUAN, JABATAN PENDIDIKAN DAN BAHAGIAN-BAHAGIAN BAWAH KEMENTERIAN PENDIDIKAN MALAYSIA

Dengan hormatnya perkara di atas dirujuk.

2.   Sukacita dimaklumkan bahawa Jabatan Pendidikan Negeri Sarawak **tiada halangan** untuk membenarkan tuan menjalankan kajian bertajuk :

"Google Classroom: Perception and Acceptance of Online Learning Among Malaysian Secondary School Teachers" yang melibatkan sekolah-sekolah menengah di Sarawak. Kelulusan ini tertakluk kepada pematuhan *Standard Operating Procedure* (SOP) dan peraturan semasa Perintah Kawalan Pergerakan yang sedang berkuatkuasa.

3.   Jabatan ingin mengingatkan bahawa sepanjang tempoh kajian tersebut, tuan adalah tertakluk kepada peraturan yang sedang berkuat kuasa dan menjalankan kajian seperti tajuk yang diluluskan oleh Bahagian Perancangan dan Penyelidikan Dasar Pendidikan, Kementerian Pendidikan Malaysia bil. KPM.600-3/2/3-eras(10008) bertarikh 5 Jun 2021. Surat kelulusan ini sah digunakan bermula dari **7 Jun 2021 hingga 30 November 2021.**

4.   Jabatan ini memohon agar sesalinan laporan akhir kajian dihantar ke Unit Perancangan, Kualiti dan Inovasi, Sektor Perancangan Dan Pengurusan PPD Jabatan Pendidikan Negeri Sarawak untuk tujuan rekod dan rujukan.

Sekian, terima kasih.

"WAWASAN KEMAKMURAN BERSAMA 2030"

"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,

(**Dr. ABANG HUT BIN ABANG ENGKEH**)
Timbalan Pengarah
Sektor Perancangan dan Pengurusan PPD
b.p. Pengarah Pendidikan
Jabatan Pendidikan Negeri Sarawak

G/ACS/mm:..

"MENJULANG PENDIDIKAN NEGERI SARAWAK"
"FLY KENYALANG FLY,FLY HIGH"

Appendix I

Request of Permission to Adapt UTAUT 2 Instrument

Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology

Venkatesh, V., Thong, J.Y.L., and Xin, X. "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology." *MIS Quarterly* (36:1), 2012, 157-178. [Among Google Scholar's top-10 most-cited papers in business and economics that were published between 2011 and 2015]

+ View Abstract

+ Download Paper

− Request Permission

Name*

Jacqueline Lau Chung Ling

Email*

jacling96@gmail.com|

Permission for

○ Model Picture   ● Instrument

REQUEST PERMISSION

Your message was sent successfully. You should receive the permission in a few minutes. Please check your main inbox and/or junk e-mail folder. Thank you.

Appendix J

Permission Granted to Adapt the Instrument

Permission Granted ⟫ Inbox ×

VVenkatesh Website <admin@vvenkatesh.com>

to me ▾

15:49 (8 minutes ago)

Thank you for your interest. Your permission to use content from the paper is granted. Please cite the work appropriately. Note that this permission does not exempt you from seeking the necessary permission from the copyright owner (typically, the publisher of the journal) for any reproduction of any materials contained in this paper.

Sincerely,

Viswanath Venkatesh

Eminent Scholar and Verizon Chair of Business Information Technology

Email: vvenkatesh@vvenkatesh.us

Website: http://vvenkatesh.com

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Appendix K

Official Letter of Invitation to be Panel of Instrument Validation

(Dr Mas Nida Md. Khambari)

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Date: 4th May 2021

Dr. Mas Nida Md. Khambari
Department of Foundation Studies,
Faculty of Educational Studies,
Universiti Putra Malaysia,
43000 UPM Serdang, Selangor.

Dear Dr. Mas Nida,

INVITATION TO BE PANEL OF INSTRUMENT VALIDATION

In response to the subject above, I would like to invite you to be a part of an expert review panel to evaluate the content validity of my Master of Philosophy (Social Science) supervisee's questionnaire.

Name	: Jacqueline Lau Chung Ling
Index Number	: 20AAM00803
Field of Study	: Educational Technology
Research Title	: Google Classroom: Perceptions and Acceptance of Online Learning among Malaysian Secondary School Teachers

In concern with this, attached documents are the relevant questionnaire and a brief Chapter 1 of her research proposal.

Your guidance and advice in improving the research quality and development will be highly appreciated.

Thank you very much and I look forward to hearing from you soon.

Best regards,

Priscilla Moses

....
Assistant Professor Dr. Priscilla Moses
Head of Programme (PhD Programme),
Department of General Studies,
Faculty of Creative Industries,
Universiti Tunku Abdul Rahman,
Sungai Long Campus.

Appendix L

Reply from the Panel of Instrument Validation

(Dr Mas Nida Md. Khambari)

M Gmail

Jac Ling <jacling96@gmail.com>

INVITATION TO BE PANEL OF INSTRUMENT VALIDATION

MAS NIDA MD. KHAMBARI /EDUC <khamasnida@upm.edu.my>   6 May 2021 at 14:47
To: Jac Ling <jacling96@gmail.com>
Cc: Priscilla Moses <priscilla@utar.edu.my>, Dr Cheah Phaik Kin <cheahpk@utar.edu.my>, Kristina a/p Francis <kristinaf@utar.edu.my>

Dear Jac,

Thanks for the invitation and the appointment. My comments for your instrument are appended below. I wish you all the best.

Kindest regards,
Mas Nida

Mas Nida Md. Khambari, PhD
Senior Lecturer (Instructional Technology, Learning Design & Innovation)
Department of Foundations of Education
Faculty of Educational Studies
Universiti Putra Malaysia
43400 Serdang, Selangor
+60397698178
http://nidakhambari.wixsite.com/resume

Coordinator
Immersive Learning Hub

Executive Committee
Asia-Pacific Society for Computers in Education

[Quoted text hidden]

Jacqueline-UTAUT 2 GC Questionnaire-For Content Validation.pdf
173K

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Appendix M

Official Letter of Invitation to be Panel of Instrument Validation

(Prof. Madya Ts. Dr Balamuralithara A/L Balakrishnan)

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Date: 4ᵗʰ May 2021

Prof. Madya Ts. Dr. Balamuralithara A/L Balakrishnan
Department of Creative Multimedia
Faculty of Arts, Computing and Creative Industry,
Universiti Pendidikan Sultan Idris,
35900 Tanjung Malim, Perak.

Dear Prof. Madya Ts. Dr. Balamuralithara,

INVITATION TO BE PANEL OF INSTRUMENT VALIDATION

In response to the subject above, I would like to invite you to be a part of an expert review panel to evaluate the content validity of my Master of Philosophy (Social Science) supervisee's questionnaire.

Name	: Jacqueline Lau Chung Ling
Index Number	: 20AAM00803
Field of Study	: Educational Technology
Research Title	: Google Classroom: Perceptions and Acceptance of Online Learning among Malaysian Secondary School Teachers

In concern with this, attached documents are the relevant questionnaire and a brief Chapter 1 of her research proposal.

Your guidance and advice in improving the research quality and development will be highly appreciated.

Thank you very much and I look forward to hearing from you soon.

Best regards,

Priscilla Moses

....

Assistant Professor Dr. Priscilla Moses
Head of Programme (PhD Programme),
Department of General Studies,
Faculty of Creative Industries,
Universiti Tunku Abdul Rahman,
Sungai Long Campus.

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888   Fax: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288   Fax: (603) 9019 8868
Website: www.utar.edu.my

Appendix N

Reply from the Panel of Instrument Validation

(Prof. Madya Ts. Dr Balamuralithara A/L Balakrishnan)

Jac Ling <jacling96@gmail.com>

INVITATION TO BE PANEL OF INSTRUMENT VALIDATION

Dr Balamuralithara Balakrishnan <balab@fskik.upsi.edu.my>
To: Jac Ling <jacling96@gmail.com>

5 May 2021 at 08:03

Dear Ms. Jac,

Please find the attached file.

All the best.
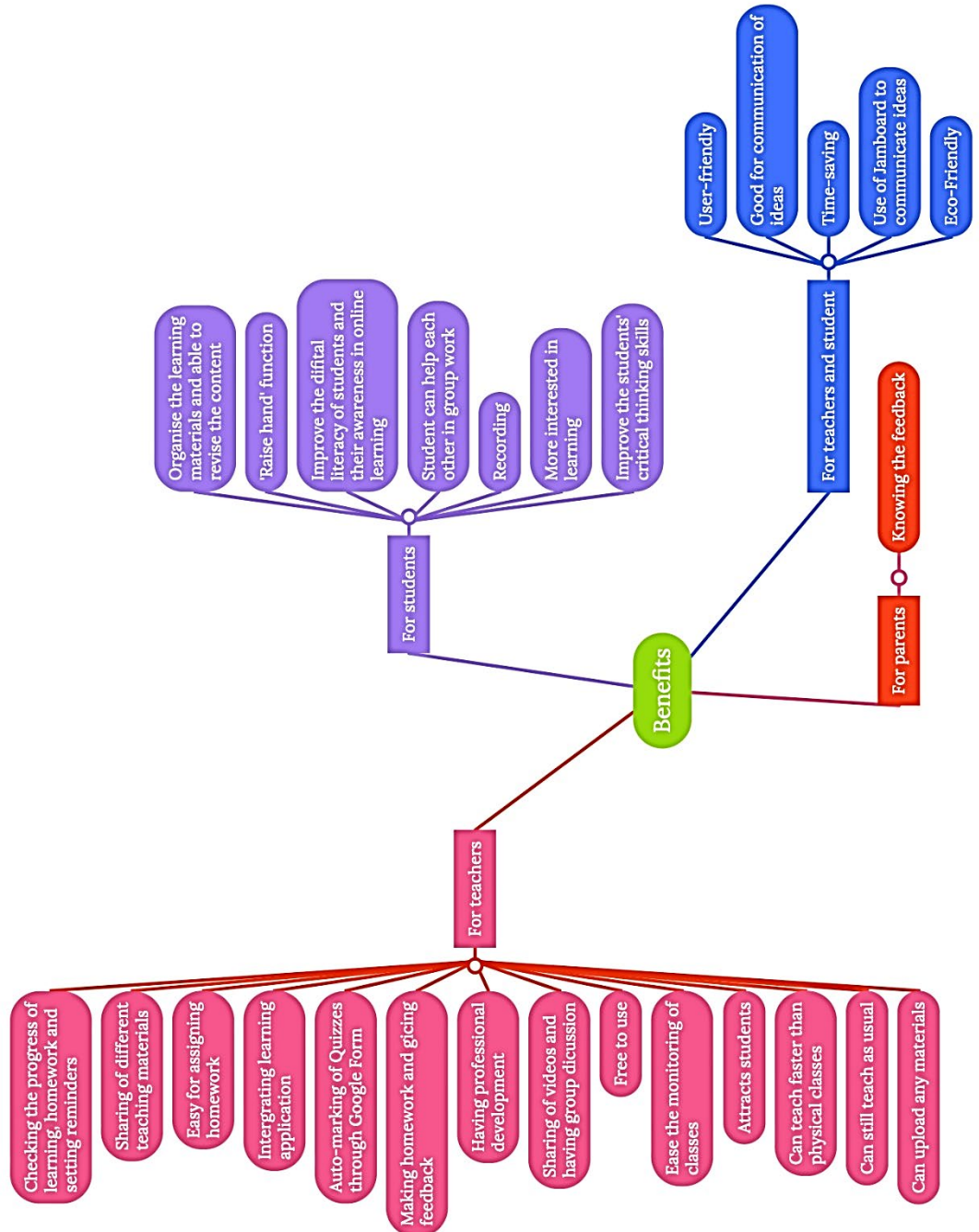
God Bless
Balamuralithara Balakrishnan
FSKIK, UPSI
Tel: +605-4505947
HP: +6013-3842895

[Quoted text hidden]

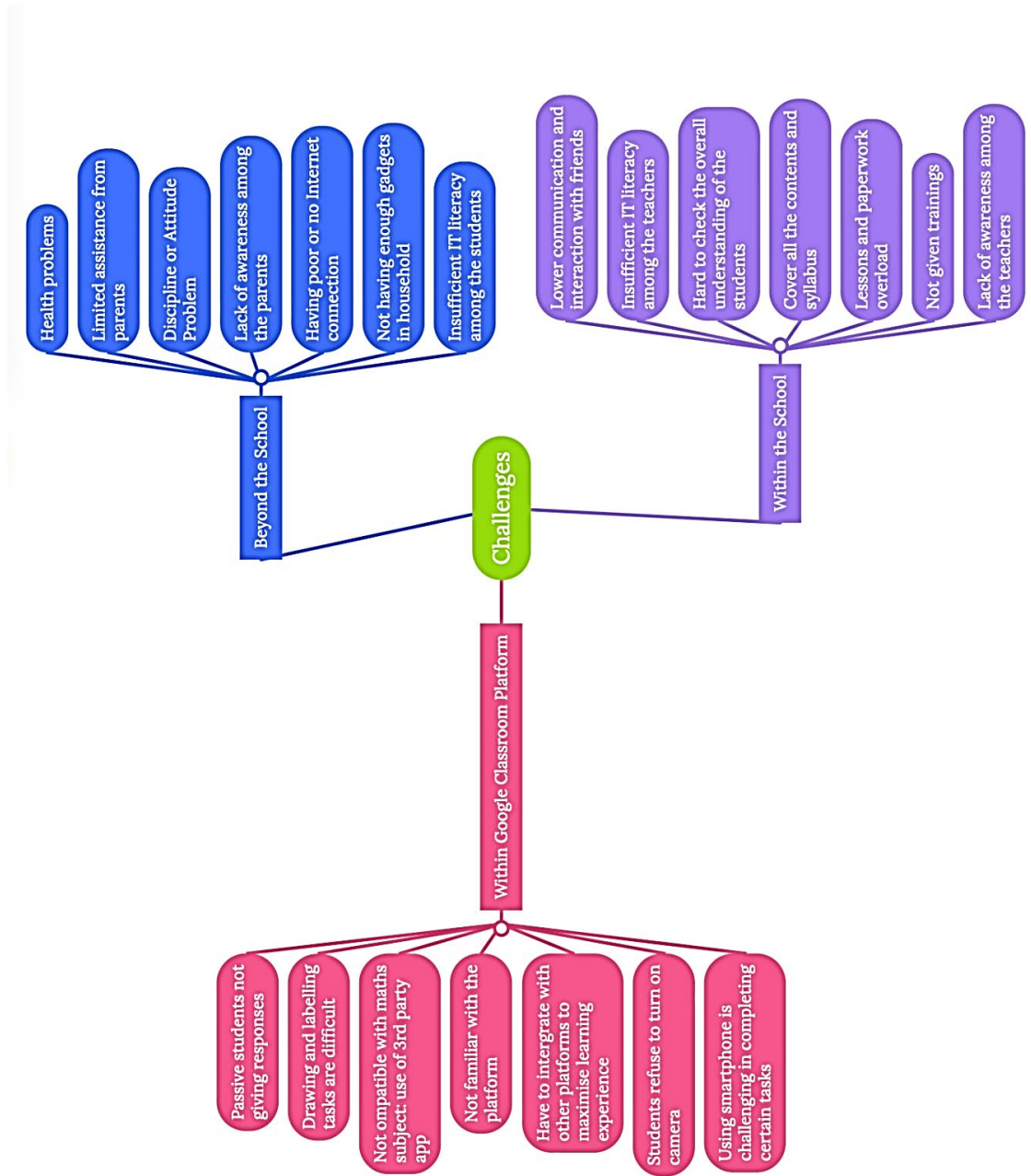Jacqueline-UTAUT 2 GC Questionnaire-For Content Validation.docx
65K

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Network of themes in Benefits of Using GC

Network of themes in Challenges of Using GC

Network of themes in Suggestions on Improving the Condition

Improve the digital literacy of the students and teachers

Provide trainings in using Google Classroom

Prepare proper guidelines in using Google Classroom

Encourage the learning web among teachers

Improve the awareness of parents in understanding the importances of supporting online learning

Focus more on STPM

Make changes for the requirement of PDPR, focus on quality more than quantity

Improve Internet connectivity and provide more gadgets to the students

For government

Suggestions

For school

For Google Classroom

Google CLassroom should come out with its own gaming and learning application

Include VR

Improve the accessibility of Jamboard

Improve the posting of questions

Add on sensor that can detect the presence of students

Should improve the compatibility in teaching technical subjescts (e.g. Arts)

Upload image in the comment session

Improve the intergration of e-textbook

Improve the marking features to be more compatible with all subjects

Show the marks, not the grades of the homework

Improve the function of giving feedback

Make it like social platforms(fb, telegram)

Should learn from other online learning platforms

Improve the host controls, can control the webcam and microphone

Have to intergrate with other platforms to maximise learning experience

Include the notification on the status of assignment

Use reward system to motivate the students and teachers

Admin should monitor the classes

More pratices are needed for the students

Have online Q&A at night to complement the teaching

Provide ICT classes to the students since young

Give remedial activities to students

Improve the students' involvement

Make using Google Classroom a compulsory task, not an option

Appendix R

Sankey Diagram of the Interview Findings