FACTOR INFLUENCING USE OF DIGITAL TECHNOLOGY AMONG SECONDARY SCHOOL TEACHERS

By

SITI SYUHADA BINTI ABU HANIFAH

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DEDICATION

All praise to the Almighty Allah that I am here to see this day. This thesis is dedicated to my late mentor, Professor Dr Ganakumaran Subramaniam. May your beautiful soul find eternal peace. My dearly loving parents, Abu Hanifah Abdul Rahman and Che Som Mustafa. Professor Dr Ahmad Fauzi Mohd Ayub and Dr Norliza Ghazali, my supervisory committees. Muhamad Syaamil Bin Abdul Razak, my loving husband, and finally, Annisaa' Irdinaa Muhamad Syaamil, my dearest daughter.

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Chair   **: Norliza Ghazali, PhD**
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In recent years, the use of digital technology has become vital for individuals to survive in a digital society. In education, digital technology use is becoming a critical component of the development of effective pedagogical practise and student learning enhancement. To meet the demand, this study summarises the findings of an investigation on factors affecting teachers' digital technology use using an adaption of the Unified Theory of Acceptance and Usage of Technology (UTAUT) and European Framework for Educators' Digital Competences (DigCompEdu). The purpose of this study is to predict a model of the factors that influence secondary school teachers' digital technology utilization. This will be accomplished by determining the level of teachers' digital competence, establishing relationships between constructs such as personal innovativeness, ICT facility, technology self-efficacy, subjective norms, attitude toward digital technology, and digital competence and finally, developing a model. A survey was conducted with 363 secondary school teachers from 50 public secondary schools in 11 districts of Pahang. To obtain the sample, proportionate stratified sampling was used. A quantitative study using the correlational technique has been proposed to address it. The participants were asked to complete a questionnaire related to the constructs. The findings indicate that teachers have an average level of digital competence. In terms of the model, it has been established that personal innovativeness, self-efficacy in technology, subjective norms, and digital competence have a significant effect on teachers' use of digital technology. However, it was discovered that ICT facilities have no measurable impact on use of digital technology. The overall structural model with six paths has explained 37.6 percent of the variance for use of digital technology among secondary school teachers. The final section of the paper examined possible causes for the study's findings and made recommendations for further research. These findings emphasise the importance of increasing teachers' digital competence as well as numerous factors that influence teachers' use of digital technology in order to fulfil the expectations of future qualified professions and thus prepare students for the digital world.

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Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

FAKTOR YANG MEMPENGARUHI PENGGUNAAN TEKNOLOGI DIGITAL DALAM KALANGAN GURU SEKOLAH MENENGAH

Oleh

SITI SYUHADA BINTI ABU HANIFAH

September 2022

Pengerusi : **Norliza Ghazali, PhD**
Fakulti : **Pengajian Pendidikan**

Sejak kebelakangan ini, penggunaan teknologi digital telah menjadi perkara penting bagi semua individu untuk bertahan dalam masyarakat digital. Dalam pendidikan, penggunaan teknologi digital telah menjadi komponen penting dalam pembangunan amalan pedagogi yang berkesan dan peningkatan pembelajaran pelajar. Untuk memenuhi keperluan, kajian ini meringkaskan penemuan penyiasatan terhadap faktor - faktor yang mempengaruhi penggunaan teknologi digital guru dengan menggunakan Teori *Unified Theory of Acceptance and Use of Technology* (UTAUT) dan *European Framework for Educators' Digital Competences* (DigCompEdu). Tujuan kajian ini adalah untuk meramal model faktor-faktor yang mempengaruhi penggunaan teknologi digital guru sekolah menengah. Ini akan dicapai dengan menentukan tahap kecekapan digital guru, mewujudkan hubungan antara konstruk seperti inovasi peribadi, kemudahan ICT, efikasi kendiri dalam teknologi, norma subjektif, sikap terhadap teknologi digital, dan kecekapan digital dan akhirnya, membangunkan sebuah model. Satu tinjauan telah dijalankan dengan 363 guru sekolah menengah dari 50 sekolah menengah awam di 11 daerah negeri Pahang. Bagi mendapatkan sampel, pensampelan berstrata berkadar digunakan. Kajian kuantitatif menggunakan teknik korelasi telah dicadangkan untuk menjalankan kajian ini. Para peserta diminta melengkapkan soal selidik yang berkaitan dengan konstruk. Penemuan menunjukkan bahawa guru mempunyai tahap purata kecekapan digital yang sederhana rendah. Dari segi model, telah dibuktikan bahawa inovasi peribadi, efikasi kendiri dalam teknologi, norma subjektif, dan kecekapan digital mempunyai kesan yang signifikan terhadap penggunaan teknologi digital guru. Walau bagaimanapun, didapati bahawa kemudahan ICT dan sikap terhadap teknologi digital tidak mempunyai kesan yang boleh diukur terhadap penggunaan teknologi digital. Model struktur keseluruhan dengan 6 laluan telah menjelaskan 37.6 peratus daripada varians penggunaan teknologi digital dalam kalangan guru sekolah menengah. Bahagian terakhir penyelidikan ini mengkaji kemungkinan penemuan kajian dan membuat cadangan untuk penyelidikan lanjut.

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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Declaration by the Graduate Student

I hereby confirm that:
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This is to confirm that:
- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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LIST OF ABBREVIATIONS

A	Attitude towards Digital Technology
AGFI	Adjusted Goodness of Fit Index
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CR	Critical Ratio
DC	Digital Competence
DIT	Diffusion of Innovation Theory
GFI	Goodness of Fit Index
ICT	Information and Communication Technology
ICTF	ICT Facility
MLE	Maximum Likelihood Estimation
MI	Modification Index
MM	Motivational Model
MPCU	Model of PC Utilization
RMSEA	Root Mean Squares Error of Approximation
PI	Personal Innovativeness
SCT	Social Cognitive Theory
SEM	Structural Equation Modelling
SN	Subjective Norm
TAM	Technology Acceptance Model
TSE	Technology Self-efficacy
UDT	Use of Digital Technology

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CHAPTER 1

INTRODUCTION

1.1   Research Background

Malaysia has an extensive history of embracing digital technology in various sectors. The government has significantly made investments in developing and implementing digital solutions. The Malaysian government establish the goal of becoming a well developed digital economy by 2030. Consequently, the national administration implemented several initiatives to support this objective, including the National Digital Infrastructure Plan and the Digital Malaysia Framework.

In the Malaysian healthcare sector, digital technology has been used to improve patient care and streamline administrative processes. The Electronic Health Record system has been developed by the Malaysian Ministry of Health (MOH) to provide a centralized database of patient health information. Digital technology has also been used to improve operational efficiency and increase competitiveness in the business sector. For instance, numerous Malaysian companies implemented digital solutions such as cloud computing, artificial intelligence, and e-commerce platforms to enhance their business operations. Additionally, the Malaysian government has established several digital free trade zones to encourage the development of digital businesses and attract foreign investment. Meanwhile in the education sector, digital technology is progressively utilized to support teaching and learning. The Malaysian Ministry of Education (MOE) launched several initiatives to provide students with digital devices and access to digital learning resources. In the healthcare sector, digital technology has been used to improve patient care and streamline administrative processes.

The utilization of digital technology in Malaysia focuses on exploring the benefits and challenges of implementing digital solutions in various sectors. This utilization also emphasize on the potential impact of these solutions on the economy, society, and individuals.

1.2   Digital Technology in Education

The integration of digital technology in education is essential to gain better quality of education (Makarova & Makarova, 2018). Morris and Rohs (2021) stressed that the use of digital technology in education has the potential to encourage self-directed learning. Digital technology also transforms the traditional learning system to modern and digitalized learning system (Cloete, 2017). The vast benefits through digital technology encourage countries around the world to incorporate digital technology in their curricula and reforming their educational policies.

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Malaysia established the Education Blueprint 2013–2025, consisting of 11 shifts to transform and enhance the Malaysian education system (Ministry of Education Malaysia, 2013). The seventh shift in this plan is the ICT policy. This policy concentrates on three specific goals: accommodating all the schools across the country with online access and a virtual learning environment, upgrading online content to share best practices, and optimizing ICT use for distance and self-directed learning. In Wave 1 (2013–2015), MOE initiated a project, 1BestariNet provides network infrastructure and a virtual learning environment (VLE) platform. More digital devices, particularly tablets or smartphones, are provided to students and teachers.

By the end of 2015, teachers should possess a minimal level of ICT literacy, and the ministry would improve its training programs to ensure this. The administration's criteria for ICT literacy are based on the International Society for Technology in Education (ISTE) rubric for ICT proficiency. The then existing ICT services such as EduWeb TV would be transferred into the VLE and integrated in its various database and management information systems. Next, Wave 2 (2016–2020) focused on introducing ICT innovations. The ministry concentrated on developing and testing specialized programs for populations with particular needs during this period of time. In addition, as a continuation of the Wave 1 program, numerous digital gadgets and programs applied in the school system. Wave 3 (2021–2025) would concentrate on boosting ICT utilization among students and teachers.

1.3 Digital Technology Utilization in Education

In recent years, there has been an increasing interest among educators in digital technology utilization. As part of its goal to build a digitally knowledgeable society, the MOE has promoted incorporation of digital technology in the educational settings. As a result, there has been substantial growth in the use of digital technology in educational institutions and subsequently, a growing need to comprehend how educators integrate digital technology into their teaching practices.

Kumar et al. (2020) investigated the adoption of Google Classroom (GC) as a learning tool by lecturers and undergraduate students. The researchers pointed out that GC was generally well-received and presented as a good learning environment. Participants in the study believed that GC could be utilized in other courses since it permits for a paperless classrooms, more straightforward assessments, and easy access to learning materials. The following research by Phoong et al. (2019) scrutinised at how Smart Classroom affected 72 undergraduates studying Mathematics. Smart classrooms were viewed positively by the participants as engaging and entertaining learning environments, while also assuring higher concentration, curiosity, and overall academic growth. Anmary and Mohammed (2022) stated that English as Second Language (ESL) students could memonteously benefit from using video presentations to develop their presentation abilities in public speaking. This study described that video presentations increase students' motivation and satisfaction at the end of the lesson.

Mun et al. (2019) adopted active learning with a Digital Smart Board (DSB) program to teach mathematics in primary schools. According to the study's findings, active learning employing a DSB program has qualities that can effectively improve student learning. Furthermore, Lim and Md Noor (2019) analyzed the efficacy of digital storytelling in increasing students' writing ability at the secondary school level. The data determined that students significantly improved their writing performance after four treatments using digital storytelling tools. Following that, Abdul Samat and Abdul Aziz (2020) emphasized on teaching indigenous primary school students in Johor comprehension skills through audio, video, and still images. The application of multimedia learning in the instruction of reading comprehension is beneficial since incorporating different media elements facilitates the comprehension process.

Educators have utilized various digital technologies to complement their instructions inside and outside the classroom for years. In general, digital technology offers educators a wide range of tools to enhance and enrich their teaching while supporting student learning in fresh and innovative ways.

1.4 Statement of the Problem

Teachers and organizers of extracurricular activities acknowledge the appropriateness of using digital tools, which, in turn, enriches the variety of educational experiences (Ovcharuk et al., 2020). Following the Malaysian teachers' inadequacy access to digital technology reported by SSQS 2018, Ebrahimi and Yeo (2018) revealed that digital technology is exclusively utilized for education only by 57 per cent of teachers in Johor, Malaysia. There were 120 teachers and 120 pupils from thirty public schools in Johor participated in the study. Following that, Abdullah et al. (2019) established that the use of digital technology in Malaysia among mathematics teachers remains low in comparison to South Korean teachers. This was found in a study among 71 mathematics teachers from Malaysia and 51 teachers of mathematics from South Korea. These studies highlight that the use of digital technology among teachers in Malaysia is still not noticeable despite numerous initiatives across the nation have been executed. In consequence, this compels the researcher to investigate more on the possibility of ICT facilities impacting digital technology use among teachers.

In the Malaysian public schools, ICT facility or infrastructure accessibility by the teachers was an issue as well. A study by Cheok et.al (2017) revealed that poor internet connection and facilities such as computers were some of the challenges that influenced 60 teachers from two Malaysian states in using digital technology during lesson. The scenario does not change after a couple of years. Razak et al. (2019) also investigated 14 teachers from two Malaysian public primary schools. The findings uncovered the same results where inadequate ICT facilities at schools was still was among the challenges faced by the teachers. The research of Hasin and Khalid (2021) highlighted that rural schools in Malaysia have inadequate technological facilities. They added that certain schools lack the necessary technological infrastructure and supplementary resources to facilitate the teaching and learning process. These factors influence the digital technology utilization of teachers for instructional purposes. The above studies can infer

that, teachers' use of digital technology were influenced by the accessibility of ICT facilities.

Educators also asseted that lack of support by school management and colleagues was a dominant barrier in using digital technology for teaching and learning (Mynaríková & Novotný, 2020). A study on teachers showed that teachers' use of digital technology was determined by school principals as the drivers towards digital technology integration in the classroom (Baharuldin et al., 2019). On the other hand, another study by Hafiza Hamzah et al. (2021) in Hulu Langat, Selangor, involving 400 secondary school teachers concur that principals support the use of ICT and digital technologies throughout the curriculum. Both findings revealed a correlation between the social circle of teachers and their use of digital technology. Given this, social circle or subjective norms can be deduced as one of the factors that influence teachers to use digital technology.

Although ICT facilities are available at school, teachers were still less competence to take advantage of the opportunity (Joo et al., 2018). This situation emerges when the educators were less confident and not able to use digital technology as an effective facilitator. This sign indicates that teacher's self-efficacy levels in using technology were still at an alarming level (Hatlevik & Hatlevik, 2018). Izhar et al. (2021) discovered in their study among 182 Malaysian secondary school teachers that they do not have sufficient knowledge and abilities to convert hardcopy recources to softcopy and publish them digitally or online. A lack of confidence in their capacity to teach online was a result of their poor knowledge and experience in online teaching. Therefore, it was difficult for them to prepare teaching materials that work for students with different levels of ability, develop strategies that work for all students, and plan synchronous lessons. Therefore, the researcher presumes that the study of teacher's technology self-efficacy is very important as mentioned by several researchers (Hatlevik & Hatlevik, 2018; Birisci & Kul, 2019; Thurm & Barzel, 2020).

The current scenario suggests indirectly that teachers need to know how to use online learning platforms to ensure that teaching and learning are effective, and that digital technology is utilized well. This effort is to support the 4th Wave of Smart School: Consolidation and Sustainability (2011-2020). An assessment was introduced to the Malaysian teachers through an online diagnostic test to find out the level of their digital competence. The latest data obtained by MOE was in 2014 (Malaysian Ministry of Education, 2013), and has not been officially updated since. It is crucial to conduct such evaluations as it would assist teachers in evaluating their level of digital competence and determining which areas need more training and professional development.

According to Smart School Qualification Standards Report 2018 (SSQS) (Ministry of Education, 2018), Malaysian teachers' digital competence was reported to be outstanding however the use of digital technology was found to be lower than anticipated. It describes teachers' digital competence in technology operation, pedagogy, professional development, and from the perspectives of social, ethical, and cyber security ranges from 4.31 to 4.78 – each item in SSQS measured in the form of a point (The point with the greatest value is 5.00, while the point with the lowest value is 0.00). Teachers and students use of the virtual learning environment (VLE) was, on the other hand, only

documented at 2.68 and 2.73 respectively for teachers and pupils. This finding was contradicted with several researchers who stated that teachers' use of digital technology becomes higher as the level of digital competence becomes better. Therefore, it is essential to investigate and explore more on the connection between digital competence and use of digital technology.

Additionally, the researcher takes note of several study gaps in the research area. Firstly, studies on schoolteachers' digital competence level in Malaysia are still needed to be implemented intensively since most research was held in overseas contexts. Krumsvik et al. (2016) explored the factors that predict teachers' digital competence levels in upper secondary schools in Norway. Benali et al. (2018) meanwhile studied teachers' digital competence of 160 Moroccan English teachers. In addition, Dias-Trindade and Moreira (2020) assessed high school teachers' digital competence level in Portugal. In Malaysia, Naim and Abdul Razak (2020) studied the factors that influence ESL lecturers' digital competence. Similarly, a study by Hizam et al. (2021) was conducted comprising university lecturers. This study fills the gap by identifying the level of schoolteachers' digital competence in one of the states in Malaysia.

Next, the researcher ascertained that several scholars had investigated the use of digital technology by Malaysian teachers. Belgheis and Kamalludeen (2018) assessed teachers' intentions to implement GeoGebra in teaching mathematics. Yew and Tan (2020) studied on teachers' intentions to utilize online educational technologies concerning their ICT competency, infrastructure, online resources, and working environment. In addition, Mohamed Jamrus and Razali (2021) reported on English teachers' readiness, acceptance, and intention to adopt Augmented Reality (AR) in teaching reading. Besides that, Rashid et al. (2021) explored the attitudes and tendencies of teachers to employ VLE as a teaching tool. Recently, Zainal and Saimin (2021) conducted an exploratory study but focusing on teachers' digital technology cognition upon digital technology use. However, the emphasis of the previously cited studies was on teachers' intention, readiness, and acceptance of digital technology rather than the actual use of digital technology. The researcher believes that a study concentrating on the use of digital technology itself would fill the observed research gaps.

The researcher found it challenging to find developed models that included the digital competence construct to extend the Unified Theory of Acceptance and Use of Technology (UTAUT). For instance, Guillén-Gámez et al. (2020) used Pedagogical Digital Competence (PDC) exclusively to investigate the digital competence level of teachers and their use of Moodle modules. Similarly, Zhang et al. (2021) used UTAUT and Technological Pedagogical and Content Knowledge (TPACK) in their research. In the meantime, Rahimi and Tafazoli (2022) merged a few 21st-century Digital Competence Framework constructs to extend the Theory of Planned Behavior (TPB). Consequently, it is expected that the model developed by the researcher integrating the construct of digital competence from the Digital Competence of Educators (Digcompedu) Framework would bridge the gap.

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1.5   Research Objectives

The main purpose of this research was to develop a model of the factors that influence secondary school teachers in utilizing digital technology. Therefore, the following are the particular aims:

1. To identify the level of secondary school teacher's digital competence.

2. To determine the relationship between personal innovativeness, ICT facility, technology self-efficacy, subjective norms, attitude towards digital technology and digital competence with use of digital technology among secondary school teachers.

3. To develop a model that predicts factors that influence the use of digital technology among secondary school teachers.

1.6   Research Hypotheses

H_0 1: Personal innovativeness has a significant influence on use of digital technology.

H_0 2: ICT facility has a significant influence on use of digital technology.

H_0 3: Technology self-efficacy has a significant influence on use of digital technology.

H_0 4: Subjective norm has a significant influence on use of digital technology.

H_0 5: Attitude towards digital technology has a significant influence on use of digital technology.

H_0 6: Digital competence has a significant influence on use of digital technology.

1.7   Significance of the Study

The goal of reforming Malaysia's education system is to prepare students holistically with all the possibilities and concerns for success in the twenty-first century (Malaysian Ministry of Education, 2013). To achieve the goal, digital technology utilization in education is necessary and a necessity.

Teachers with high level of digital competency are better equipped to support students effectively using digital technology for learning. This integration in their teaching practices will enhance students engagement and achievement. On this note, this study

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provides data on teachers' digital competence levels in six areas of the DigCompEdu Framework. Teachers can use the data to identify areas they would need to improve their digital competency and to track their progress over time. From there, they can set their goals, prioritize professional development, and stay up to date with the latest technology. in addition to that, schools may utilize the data to identify areas they need to provide additional support and resources for their teachers and to evaluate the impact of professional development initiatives. The data are also beneficial for policymakers to make informed decisions about investment in teacher training and professional development. Following that, they can evaluate the effectiveness of current policies and initiatives to ensure that resources are used effectively and effeciently to assist teachers in utilizing digital technology. As for the researchers, they can use the data to acquire a deeper comprension of the elements that contribute to teachers' digital competency and to identify best practices to support teachers in digital technology use. Here, the establishment of new programs and policies begin to facilitate teachers' technology adoption.

The proposed model of the study adds the digital competence variable to extend the UTAUT model. The UTAUT provides a comprehensive framework for understanding how and why individuals adopt the technology. The proposed model significantly contributes to the further development of theories in the field of information technology and communication. In addition, it increases the empirical evidence, which helps to support or challenge existing theories in the field. Apart from that, the proposed model assists researchers for a more nuanced understanding of how the level of digital competence affects technology adoption and usage. Besides, training providers can also use the information from the model to develop more effective marketing and training strategies. Furthermore, it also helps inform the design of technology solutions. For example, designers can employ this data to construct user-friendly interfaces and simplify the adoption process for individuals with lower levels of digital competence to enhance their use of digital technology.

This study has several practical impacts in the field of education. One of these is the improvement of teaching and learning process. By understanding how educators are utilizing digital technology in their classrooms, school leaders can identify best practices and implement them to enhance teaching and learning outcomes. The study can also help ensure that digital technology is effectively integrated in classrooms. Therefore, it will be a more meaningful and productive use of digital technology, which can improve student engagement and academic performance. Through the study, school leaders would be able to provide targeted professional development to support teachers effectively integrate technology in their teaching practices by identifying areas where teachers need additional training or support. Policy making at the local, state, and national levels will be advised so that the policies that encourage and facilitate the use of digital technology in the classroom can be enforced and sustained.

Overall, the study gives a better picture of technology adoption and usage, allowing stakeholders to make improved and informed decisions and take more effective actions to assist digital technology use. This helps to improve teaching and learning, making it easier to use technology in the classroom, and shapes education policies.

1.8　　　　Limitations of the Study

This study is carried out through a survey method and data is collected through the use of questionnaires adapted from several previous researchers to determine the relationship and predictive factors on use of digital technology among secondary school teachers in Pahang. Thus, there are some limitations on some aspects of this study such as the scope, population and study sample, research questionnaire and study analysis.

The scope of this study covers public secondary school teachers in Pahang. The selection of teachers in Pahang was to determine the impact on the teachers' use of digital technology to deliver the lessons. The rationale for choosing Pahang as the study location is based on the report issued by the Ministry of Education through the SSQS (Smart School Qualification Standard) score in 2018 where schools in Pahang has the lowest score in using digital technology compared to teachers from other states. This shows that the use of digital technology among teachers in the state of Pahang is not as expected as it should be.

The study population includes all teachers in secondary schools. The selection of teachers was made assuming all teachers use digital technology to teach in their class. The study sample was randomly selected from the population of teachers in Pahang. As a result, the findings of this study can only be used to describe the population of secondary school teachers in the selected state.

Study data was collected using a questionnaire distributed to teachers via online and the answers obtained were analyzed using SPSS (Statistical Package for the Social Sciences) and SEM (Structural Equation Modelling) software. Items measured are limited to the objectives of the study only. On that account, the accuracy of the study data is highly dependent on the extent to which the respondents honestly answered the questionnaire provided.

The analysis of this study involves the process of data analysis using SPSS software for descriptive analysis and SEM for inference analysis for the purpose of testing the variables of this study. Selected study variables based on Unified Theory of Acceptance and Use of Technology (UTAUT), and Digital Competence of Educators Framework (DigCompEdu) adapted by Venkatesh, Morris, and Davis (2003), Redecker and Punie (2017) that focus only on personal innovativeness, ICT facility, technology self-efficacy, subjective norms, attitude towards digital technology, digital competence and use of digital technology among secondary school teachers. Other factors were not considered, hence, this research focuses only on the indicated factors.

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1.9 Definition of Terms

The following terms are defined within the context of this study:

1.9.1 Personal Innovativeness

Personal innovativeness is the degree to which an individual perceives that employing a specific information technology will enhance his or her learning or job performance (Davis, 1989). Also, personal innovativeness is the willingness to accept new technologies (Agarwal & Prasad 1998). In this study personal innovativeness is the extent to which an individual is prepared to adopt digital technology and feels that digital technology will improve his or her teaching effectiveness.

1.9.2 ICT Facility

Pradhan, Mallik, and Bagchi (2018) described an ICT facility as a digital telephone network, mobile phones, internet capacity, internet servers, and fixed broadband. It was described by UNESCWA (2016) as a collection of technologies that aid in the smooth operation of organizations. These services are crucial to an organization's day-to-day operations and successful service delivery. Among them are hardware, software, networking, and implementation. In the context of this study, ICT facility is defined as any facility, tools, hardware or software whether in schools or at home and utilized by the teachers to use digital technology.

1.9.3 Technology Self-efficacy

Technology self-efficacy is the notion that one possesses the necessary and appropriate talents and skills to handle a technology-related activity effectively (McDonald & Siegall, 1992). Technology self-efficacy refers to a teacher's perceived capacity to integrate digital tools into classroom and to provide meaningful education utilizing relevant digital resources (Holden & Rada, 2011). For this study, technology self-efficacy refers to teachers' belief on their capability to use digital technology.

1.9.4 Subjective Norm

Fishbein and Ajzen (1975) described subjective norm as an individual belief that most influential individuals in his life believe he should or should not engage in the particular behaviour. Subjective norm is also defined by Chiou (1998), as a result of an individual thoughts about important referent others' expectations and ability to keep up with these referents. In this study, subjective norm refers to social circle of a teacher that directly or indirectly influence the teacher to use digital technology.

1.9.5   Attitude towards Digital Technology

Attitude is determined by the perceived consequences associated with a behavior. (Chiou, 1998). Attitude towards technology is defined as positive affect towards technology (Edison & Geissler, 2003). According to Venkatesh et al. (2003), attitude toward technology is defined as an individual's total expressive response to utilizing a system. In this study, attitude towards digital technology refers to an individual's personal reaction to the use of digital technology.

1.9.6   Digital competence

Generally, digital competence may be described as the capacity to confidently, critically, and creatively utilize ICT to fulfill objectives relating to work and employment, study, leisure, and being part of society (Ferrari, 2013). Krumsvik (2007) defines a teacher's digital competence as a teacher's capacity to utilise ICT with an excellent understanding of teaching strategy via ICT and to be aware of how this may affect students' learning techniques and educational development (p.68). Digital competence in this study refers to teachers' ability to use digital technology confidently, critically, and creatively to convey the content of the lesson to the students.

1.9.7   Use of Digital Technology

Ng (2015) described digital technologies as electronic devices used for educational, social, and recreational purposes in formal and informal contexts. Desktop computers, mobile devices, digital recording devices, data logging equipment and accompanying probes, interactive whiteboards, Web 2.0 technologies and other online resources, and the range of commercially available offline educational software packages are all examples of digital technology in education. UNESCO (2018) via UNESCO ICT Competency Framework for Teachers states that digital technology is synonymous with ICT and includes computers, mobile phones, digital cameras, satellite navigation systems, electronic instruments and data recorders, radio, television, computer networks, satellite systems, and nearly everything that manages and distributes information electronically, including both hardware and software. Use of digital technology in this study refers to the degree to which teachers integrating technological tools and resources to improve their teaching.

1.10   Summary

The background of the study was deliberated in this chapter. It is initated with the research background of the study before briefly reviewing the evolution of digital technology in education and digital technology utilizations among educators. This chapter also examined the study's issue statements, aims, research hypotheses, limitation, and definitions of terms. The subsequent chapter will examine the literature reviews on the factors that contribute to teachers' utilization of digital technology, related theories supporting the study, and the conceptual framework.

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