UNIVERSITY OF CAPE COAST

DIGITAL DEVICE OWNERSHIP, DIGITAL LITERACY AND INFORMATION TECHNOLOGY LEARNING SELF-EFFICACY OF JUNIOR HIGH SCHOOL STUDENTS

GRACE ARABA BINEY

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BY

GRACE ARABA BINEY

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DECLARATION

Candidate's Declaration

I hereby declare that this research is the result of our own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: …… …. Date: ……..

Name: GRACE ARABA BINEY Index number: ED/ITD/20/0010

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature:…… Date:……

Name: DR. EMMANUEL ARTHUR-NYARKO

ABSTRACT

The study investigated digital ownership, digital literacy and information technology learning self-efficacy of junior high school students. The descriptive survey research design was adopted for the study. Through the use of simple random sampling procedure, 70 JHS 3 pupils in the Ayifua St. Mary's Anglican Basic School were selected for the study. The questionnaire was used to gather the data for the study. The data were analyzed using both descriptive and inferential statistics such as frequency counts, percentages, means, standard deviations, multiple regression analysis and independent samples t-test. The study found that, the level of information technology learning self-efficacy among students was to a moderately high extent. Also, students did not have/own most of the digital devices. With the exception of flash drives, which was the only digital device most of the students indicated that they had/owned. Again, to a moderately high extent, the students were competent with digital literacy skills and the relationship between digital ownership, digital literacy skills and information technology learning self-efficacy among students was moderate but positive. The study recommended that the Government of Ghana through the Ministry of Education and the Ghana Education Service should make ICT facilities and tools available to the various basic schools so that students can familiarize themselves with their use. Again, the Ministry of Education and the Ghana Education Service should provide in-service training and frequent workshops for teachers on how to use modern technology to: upload students' grades/results; capture statistic images of in-class activities or resources; and record their teacher's lesson or in-class activities (audio, visual, or both) for students to learn and perform assignments.

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DEDICATION

To my daughter, Henrietta Araba Thompson; and my mom, Grace Sam

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CHAPTER ONE

INTRODUCTION

Background to the Study

The significant advancement in technology has influenced nearly every aspect of human life. Among the most notable inventions of the twenty-first century are digital gadgets including laptops, smartphones, tablets, and telephones, as well as Internet-enabled devices that include computer software and apps (Foen, Hassan, Nor & Malek, 2017). Digital devices are now a commonplace aspect of daily life for everyone. People all over the world have embraced this innovative and fascinating technology as one of the most essential amenities in their daily lives, and it is now being used to further development initiatives in the fields of business and industry, agriculture, health, military, and, most of all, education (Fawareh & Jusoh, 2017).

This is conceivable since there are a lot of individuals who own digital gadgets all around the world, especially in Ghana and Africa and especially among young people. In her study "Mobile statistic report of 2014-2018," Radicati (2014) projected the number of mobile users worldwide to be 6.08 billion in 2017 and climb to 6.2 billion by 2018. He continued that there will be 10.8 billion mobile devices worldwide in 2017 and that number would climb to 12.1 billion by 2018, (Radicati, 2014).

Due to a number of advantages or benefits connected with digital devices, most individuals, including students, like to use them to complete various development chores, including those relating to academic concerns. Mobile phones, and smart phones in particular, are readily available, manageable, and reasonably priced (KIjunic & Vukovac, 2015). Importantly, digital devices like

smartphones have a variety of specialized built-in or downloadable apps like games, web browsers, music and video players, personal organizers and calendars, web services like YouTube and Flicker, productivity apps like word processors, news feeds, email and social networking apps, as well as many other practical and entertaining tools. Google Play (for android devices) and the iTunes App store (for the iPhone) are the two most popular app stores. Many apps are actually available for free or are fully ad-supported, despite the fact that it is labeled a market.

The proliferation of digital gadgets has significantly changed education in industrialized countries, with developing countries being no exception (Tagoe, 2014). The spread of these facilities has altered the way that people learn, so that people are no longer completely dependent on written sources. The development of digital gadgets, which allow learning to occur regardless of place or time, was facilitated by the introduction of the internet.

Due to their perceived usefulness, including their perceived affordability, flexibility, readiness, popularity, and other practical features, the majority of educators have adopted the use of cellphones for teaching (Ismail, Bokhare, Azizan, & Azman, 2013; Pullen, Swabey, Abadooz, & Sing, 2015). The adoption of smartphones has already reached critical mass in developed economies, according to Groupe Speciale Mobile Association (GSMA) (2015), with half of the world's population having a mobile subscription. Although the use of cellphones among students is growing, it is still unclear to what extent this technology has boosted their confidence in using information technology. Students in Malaysia weren't prepared for mobile learning in this instance (Akkan, Cakirglu, & Güven, 2012). As a result, smartphone is not a learning tool

(Collins, 2019). According to research by Woodcock, Valk, Rashid and Elder (2012), students were consistently seen using their phones more for entertainment than for academic purposes.

Over the years, several studies have assessed Bandura's self-efficacy construct (Shunck, 2014; Eccles, 2019; Britner & Pajares, 2016). Self-efficacy, according to Bandura (1986), almost gives the person the feeling that success in a particular field is practically assured even before the act is started. In fact, he believes that there is a significant difference between people who have high self-efficacy and those who have low self-efficacy in terms of how they feel and behave (low self-efficacy). People who doubt their own talents tend to steer clear of demanding and tough tasks. According to Bandura (1989), those who are unsure of their ability are less likely to take on challenging undertakings.

Refreshingly, numerous studies have been carried out to examine and investigate how children's psychosocial functioning is influenced by their level of self-efficacy (Shunck, 2014; Eccles, 2019; Britner & Pajares, 2016). The results show that self-efficacy beliefs have a considerable influence on an individual's performance and motivation. In actuality, people who have high levels of self-efficacy are more likely to carry out tasks successfully. Self-efficacy is one of the most significant factors influencing students' academic achievement, according to social cognitive theorists. Collins (2019) notes that it is crucial to recognize the impact of self-efficacy beliefs and skill use on academic success. According to his research, people may not always perform poorly on assignments because they lack the potential to achieve, but rather because they lack confidence in their talents. Intellectual aptitude and motivation are key influences on academic performance, according to Bandura (1986). Self-efficacy affects a person's

decision to choose and commit to an activity, the energy expended in executing it, and the level of performance (Bandura & Schunk, 1981; Bandura, 1986; Hackett & Betz, 1989). Self-efficacy is a significant factor in predicting a person's conduct. Regardless of their mediating effects on self-efficacy beliefs, Bandura (1997) notes that attitude and gender are influential to some degree for some persons. According to Mbathia (2015), strong academic achievement affects students' decisions as well as their admittance to college or university. According to Pajares' (2010) research, girls start to underestimate their abilities in the seventh grade despite though their performance is worse than that of the boys.

Self-efficacy with regard to these digital learning tools seems to be related to how frequently they are used. This was seen in educators who had never integrated technology in their teaching. The more proficient they were, the more eager they were to incorporate that technology into their work. According to Akkan, Cakirglu, and Güven (2012), students may be more likely to use digital technology widely if they receive effective training in using it, as opposed to presuming their fluency. This is similar to the teachers described above. Nevertheless, this discovery raises the question: Does proficiency with a particular device or collection of technologies increase interest, or does the opposite hold true—that is, does interest in a device or set of technologies increase proficiency? In order to examine the impact of web-based instruction applications on school culture, Akkan et al. (2012) conducted a case study with 31 student participants using qualitative and quantitative approaches. Surveys, interviews, and classroom observations revealed that as students utilized technology and digital devices more frequently, their interest also seemed to rise.

Rovai and Jordan (2014) note that self-motivation is a prerequisite for success in distance education, a branch of contemporary education that is built on the use of digital technology, including powerful learning management systems (LMS) and more compact digital learning tools like social media and other applications. A learner simply won't strive toward overcoming their digital deficiencies if they have a fear of technology, which is frequent among adult learners or even younger learners whose lives are less touched by digital technology (Rovai & Jordan, 2014). When responding to new educational technologies, students and teachers exhibit a range of emotions. These feelings range from exuberance to paralyzing fear, and a wide range of feelings in between (Collins, 2019). Tech-averse or change-averse learners will probably struggle since they might not be motivated to get past their anxieties and discomforts.

Libraries are becoming more automated to offer users electronic information resources (EIRs) and services as a result of the transition from printed to electronic information resources (EIRs). According to Kay and Ahmadpour (2015), students must acquire the abilities necessary to access, assess, manage, and utilise information on digital devices effectively and efficiently as the quantity of digital resources grows. As a result, it is advantageous for students to be technologically literate because it will make finding EIRs easier. This is so that only students who possess an adequate level of digital literacy can access, retrieve, and use the digitized or EIRs. Since electronic resources are a manifestation of works that need the use of digital devices for access, the significance of digital literacy for accessing EIRs cannot be overstated. On digitally linked devices like computers, tablets, smartphones,

etc., EIRs can be accessed. Users now primarily use digital devices like smart phones, tablet PCs, and e-readers to access electronic content, according to Song (2012). This shows that without sufficient digital literacy abilities and the self-assurance to use the gained skills, students cannot access and use EIRs wisely. Otokunefor (2015) defined digital literacy as a person's level of digital knowledge and the extent to which that information may be applied to solve problems. Digital literacy, according to Abubakar and Adetimirin (2015), is the ability to use digital tools and apps. Students would be able to access, use, and transmit information with the help of digital literacy skills, which are recognized as a necessary competency for active involvement in our modern world.

Statement of the Problem

Students who possess digital devices continue to be heavily involved in the teaching and learning process. In an effort to improve learning results, parents, school administrators, and other stakeholders have invested in ICT infrastructure that includes Internet connectivity and other gadgets (Gikas & Grant, 2013; Salaway & Caruso, 2007). The topic of information technology learning self-efficacy among students and its impact on teaching and learning has attracted a lot of public discourse in recent times. For instance, a recent study by the Ghana ICT for Accelerated Development [ICT4AD] Policy (2003), indicated that, the level of computer literacy self-efficacy and awareness in the country was very low and that it contributed to the low levels of development of the ICT industry in Ghana. A policy statement cited in [ICT4AD] Policy, (2003), inter alia states that policy efforts would be directed at using ICTs to facilitate education and learning within the educational system and to promote e-learning and education as well as lifelong learning within the population at large. In

furtherance of this point, Akkan, Cakirglu, and Güven (2012) assert that, students may be more likely to use digital technology widely if they receive effective training in using it, as opposed to presuming their fluency. Thus, need for this study to be conducted cannot be underestimated in order to assess the information technology learning self-efficacy of students.

Young people in the Kwahu West Municipality participated in a study by Akumfi (2018) on mobile phone use and physical activity. It was found that males and persons between 20 and 25 made much use of their phones prior to the study, and also made claims of reduced physical travels with respect to their short and long journeys. However, there was not enough evidence to show that their overall physical travels had reduced with the use of mobile phones. At the University of Ghana, Legon, Darko-Adjei (2019) evaluated how students used their smartphones and their impact on their learning activities. The study found that, laptops and smartphones ownership influenced and supported design students' learning. However, these investigations, aside from being done in a different region, only looked at one of the digital devices that were taken into account in this study. Similar to this, Enchill (2020) investigated the availability and application of information and communication technology tools for social studies instruction in a limited group of senior high schools in the Awutu Senya District. His research, however, was restricted to academic institutions and did not account for student ownership of digital devices. The study did not take student self-efficacy in studying information technology or digital literacy, either. Due to these deficiencies, the researcher was motivated to evaluate how digital ownership and digital literacy influence information technology learning self-efficacy of students at the basic school level.

Purpose of the Study

The aim of the study was to investigate how digital ownership and digital literacy influence information technology learning self-efficacy of students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. Specifically, the study sought to:

1. explore the level of information technology learning self-efficacy among students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis.
2. assess students digital device ownership at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis.
3. assess students' digital literacy skills at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis.
4. find out the influence of digital device ownership and digital literacy on information technology learning self-efficacy of students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis.
5. explore gender differences in digital literacy and information technology learning self-efficacy among students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis.

Research Questions

The study was guided by the following research questions:

1. What is the level of information technology learning self-efficacy among students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?
2. To what extent do students own digital devices at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?

3. What is the level of students' digital literacy skills at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?
4. What is the influence of digital device ownership and digital literacy on information technology learning self-efficacy of students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?
5. What are the gender differences in digital literacy and information technology learning self-efficacy among students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?

Research Hypothesis

1. **H_0:** Gender does not significantly influence digital literacy and information technology learning self-efficacy among students.

   H_1: Gender significantly influences digital literacy and information technology learning self-efficacy among students.

Significance of the Study

There are many reasons why the study is significant to many parties. The study educates students about the value of digital gadgets in supporting learning and identifies methods for maximizing their application in educational settings. The report also offers crucial steps to be followed to make sure students can successfully use digital learning technologies without having an impact on their academic performance. The study provides information on how digital devices might be used as a learning tool to the Ghana Education Service (GES), the National Council for Curriculum, Assessment (NaCCA), and other educational stakeholders. The results of this study add to the body of knowledge already available to scholars and provide a framework for further investigation.

Delimitation of the Study

Geographically, the study focused on junior high school students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. The study was limited to digital device ownership, digital literacy and information technology learning self-efficacy among junior high school students.

Limitations of the Study

Every study is bound to be faced with some restrictions which are inevitable and this study was not an exception. For instance, some of the respondents were unwilling to divulge certain pieces of information due to the fear. However, the researcher assured the respondents that their identity would be concealed and that the study would not mention their names in any part of the study but rather, the information they gave was what would be needed. Also, the questionnaire adopted for the study and some challenges emanated from this source. This is because, some of the items were not responded to by the respondents. However, the researcher checked for completeness upon receiving each questionnaire from the respondents.

Definition of Terms

The key terms used in the study are defined in this section:

Digital Devices - For the purpose of this study, digital devices refer to the means of interaction among people through the use of electronic devices in which they create/generate, send, share, communicate receive, store, display, or process information, and such electronic devices shall include: desktops, laptops, tablets, peripherals, servers, mobile telephones, smartphones, and any similar storage device which currently exists or may exist as

technology develops or such comparable items as technology develops.

Digital Device Ownership – Individuals who have or posses any of the digital devices mentioned above.

Digital Literacy – Having the skills you need to live, learn, and work in a society where communication and access to information is increasingly through the use of digital devices or technologies mentioned above.

Self-efficacy – A person's belief in his/her abilities to succeed in specific situation or accomplish a task.

Information Technology – This refers to as a varied set of goods, applications and services used for producing, distributing, processing, transforming information (including) telecoms, TV and radio broadcasting, hardware and software, computer services and electronic media.

Organisation of the Study

Following are the five chapters that make up the study: The background to the study, the statement of the problem, and the research objectives are all outlined in Chapter One. Additionally, it examines the research questions, significance of the study, delimitations, limitations of the study as well as definition of terms. The second chapter provides a thorough analysis of the pertinent literature. The approach is discussed in Chapter Three. This covers the research design, study's population, sampling strategy, research tools, data collection process, and data analysis. In Chapter Four, the examination of field data and findings took front stage. In respect to the study's stated research questions and research hypotheses, the ramifications of the findings are

examined. The final chapter, Chapter Five, provides an overview of the study's findings and conclusions. It further provides recommendations for improvement and suggests areas for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter discusses a variety of concepts found relevant for the study. Literature review was done in three thematic areas, namely; theoretical review, conceptual review and empirical review. Theoretically, the social cognitive theory (Bandura, 1977) constituted the theoretical basis for the study. The conceptual review included: the concept of digital device ownership, the concept of digital literacy, the concept of information communication technology, computer technology usage in classroom instruction and the concept of self-efficacy. A conceptual framework was also developed for the study. The empirical review considered the impact of digital learning tools on self-efficacy, digital learning tools' impact on ownership of learning and the impact of gender on ICT and digital literacy.

Theoretical Review

Social Cognitive Theory

The social cognitive theory (1977) provides the theoretical underpinning for this study. The social cognitive theory (1977) was developed by Albert Bandura in 1977. This theory emphasizes the interaction between behavior and environment, focusing on behavior patterns the individual develops to deal with the environment instead of instinctual drives. Self-efficacy is a construct which carries so much potency and almost equips the individual with limitless potential in him or herself was forged from Bandura's (1977) social cognitive theory. Self-efficacy symbolizes a strong belief in one's capabilities to organize and execute the courses of action require to produce given attainments. The effects to self-

efficacy beliefs on cognitive processes take a variety of forms. It is interesting to note that most human behavior which is purposive is regulated by fore-thought found in organized goals. Personal goal setting is influenced by self-appraisal of capabilities. This means, the stronger the self-efficacy, the higher the goals people set for themselves and the firmer their commitment to such goals (Bandura, 1977).

Bandura (1977) stressed that such beliefs influence the course of action people choose to pursue, how much effort they put forth in given endeavours, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments they realize (Bandura, 1977). This according to Bandura means individuals with a high level of self-efficacy attempt tasks and keeps up trying even though tasks might be difficult, while individuals with a low level of self-efficacy most of the times end up succumbing under pressure. Also, it suggests that persons with a higher sense of self-efficacy visualize success scenarios that provides positive guide and sustains performance whiles individuals who doubt their self-efficacy visualize failure scenarios and dwell on the many things that can go wrong, this struggle with self-doubt makes it almost impossible to achieve the maximum. As Bandura (1989) explains, an individual's beliefs about his abilities make up his sense of self-efficacy. The primary focus of self-efficacy is the evaluation of the skills an individual process.

Bandura espoused the theory of self-efficacy and subsequently, its applicability has been tested widely in many diverse areas of human discipline. Researchers have consistently demonstrated that perceptions of self-efficacy, or

beliefs in one's own abilities to realize desired outcomes, play a critical and fundamental role in determining people's subsequent functioning, adaptation, and attainments (Bandura, 1989).

Bandura (1977) in his writings touched on four key tenets as being the source and fulcrum that paves the way for self-efficacy:

i. **Enactive mastery experience:** This for him includes an individual's prior experiences with the handling of a particular task. Successes in dealing with the task strengthen self-efficacy, whereas repeated failures undermine it.

ii. **Vicarious experience:** People also establish their self-efficacy beliefs by building a model similar to others who have excelled on same or similar task. Vicarious experience exerts greater influence on self-efficacy formation when there are no absolute measures of adequacy and when people perceive similarity between the model and themselves.

iii. **Social persuasion:** Persuasive communication and evaluation feedback from significant others also influence one's judgment of self-efficacy. People can be persuaded to feel that they have special gifts or skills.

iv. **Physiological responses:** Signals or emotional re-actions such as mood changes, perspiration, or heartbeats to mention but a few also affect the way people evaluate themselves as far as self-efficacy is concerned. Recognition of these somatic symptoms leads to self-efficacy adjustments through their effects on cognitive processing.

Self-efficacy has received particular attention in educational research because of its apparent appeal and usefulness in explaining student motivation and behavior. It is important to note that self-efficacy is a multidimensional construct that varies according to the domain of demands (Zimmerman, 2010), and therefore it must be evaluated at a level that is specific to the outcome. Thus, academic self-efficacy refers to individuals' convictions that they can successfully perform a given academic task at designated levels (Shunck, Murphy & Drew, 2014). This also conditions learners internally to employ various self-regulated learning strategies required to accomplish academic work.

Social constructivism, with its emphasis on authentic learning and more cognitively complex outcomes, becomes an excellent match; its applicability to this study is relevant in explaining the understanding of information literacy as a concept that is mainly concerned with developing skills at the educational level (O'Farrill, 2018). In the context of this study, the social cognitive theory (1977) helps to significantly influence the concept of information technology learning self-efficacy among students beyond accounting for the external behaviours of information seekers to actually understanding the individual's own points of view about their information seeking behaviours (Sudin, 2018). Therefore, its application to this study which sets out to investigate the level of information technology learning self-efficacy among students is appropriate. Hence, it was adopted for the current study.

Conceptual Review

The Concept of Digital Device Ownership

There is a range of digital devices commonly owned and used by students. These devices include laptop and Smartphone or tablets (Sharples et al., 2014);

cell phones (Witecki & Nonnecke, 2015). Compelling reasons such as convenience of getting connected to educational resources via portable devices may not be the only reason for device ownership. Other reasons include students' ability to access news, calls, instant messaging, surfing, gambling, social media and data storage (Barry, Murphy & Drew, 2015).

Despite the financial burden on schools, parents and teachers, device ownership by students continues to play a significant role in the teaching and learning process. In the bid to achieve learning outcomes, parents, school authorities and other stakeholders have invested in ICT infrastructure which includes Internet connectivity and other devices (Gikas & Grant, 2013; Salaway & Caruso, 2017). In their research, Witecki and Nonnecke (2015, p. 73) posited that though "ownership and use" of devices by Higher Education students were not only on the ascendency (Cross, Sharples, Healing, 2015; Dahlstrom, Grunwald & Vockley, 2011), it also related strongly to lower course engagement. Recently, Sydney Grammar School in Australia announced that it had banned students from having laptops in school due to its role as a preventive agent to class engagement and absolute misappropriation of funds (Bita, 2016).

In contrast, other studies have held that student ownership regimes of new technologies such as computer, mobile devices and computer applications are crucial in curriculum designs and delivery (Sharples et al., 2014; Shelly, Gunter & Gunter, 2012). Access to educational resources like e-books from libraries is increased due to the proliferation of computer and mobile device ownership (Baddeley, 2012; Hamblen, 2011). According to the 2014 NMC Horizon report, Bring Your Own Device (BYOD) promotes learner-centric learning environments where learner takes charge of his/her learning (Johnson, Adams

Becker, Estrada & Freeman 2014, p. 34). Device ownership and use encourages "lecturer control" and self-directed learners (Sharples et al., 2014). The issue of device ownership in higher education is becoming more of a socio-cultural issue rather than a pedagogical issue. On the other hand, Oliver (2011) also contends that technology use in our educational landscape is exaggerated.

The Concept of Digital Literacy

The digital world is greatly transforming how we learn, communicate and socialise, so it is imperative that technology-rich learning environments are developed and embraced (Groff, 2013). Lai and Hong (2015) enquire whether the integration of mobile technologies and applications can potentially address the digital capability and proficiency levels of the current generation of technology users born after the year 1985. The current generation are not all confident users of new and emerging technologies and do not participate in the creation of personalised communications with others through Web 2.0 activities (Attewell & Hughes, 2010). Digital literacy can pose challenges for the user of Web 2.0 in learning contexts as students need adequate proficiency to effectively and efficiently use the tools (Bower, 2016; Terras & Ramsey, 2012). Valtonen's (2009) study using the theory of reasoned action and planned behaviour (Ajzen, 1991) of 337 Finnish high school students' readiness to adopt online learning highlight students' lack of knowledge about online learning alongside using social media platforms and Web 2.0 technologies.

Technology has become such an integral dimension in society where digital literacy has become essential to education, teaching and learning (Mac Callum et al., 2014; Valék & Sládek, 2012), where policymakers and educationalists recognise the importance that digitally literate graduates with

transferable skills can compete competitively and contribute positively in a technology driven economy (Choi et al., 2019; Pelgrum et al., 2013; Valék & Sládek, 2012). An alarming 50% of university students believe that their university degree course adequately prepares them for the digital workplace (Newman & Beetham, 2017). The use of mobile devices alongside integrated applications and platforms can provide the user with experience to help promote and develop digital literacy in formal learning and informal learning contexts such as libraries, at home and in online spaces (Meyers et al., 2013). The use of mobile, wireless and learning technologies in the development of student digital literacy skills requires an understanding of student attitudes to the use of emerging technologies in learning both inside and outside of the classroom.

Digital literacy is an increasingly important area for the 21st century student and HE establishments are facing increasing pressure to provide globally relevant high quality courses in conjunction with graduates with essential digital workplace skills (Daniel, 2015). Approximately 90% of all new jobs require proficient digital skills; however, some UK universities and colleges are failing to embed digital skills as part of the curriculum which can improve learner experience and staff professional development (Newman & Beetham, 2017). Lee's (2008) extended TAM study emphasises the importance of PR on user intention to use technologies highlighting the need for effective user support and training in the use of technologies.

OECD (2015) highlight the importance of students' ability to communicate and interact through this increasingly wide digital landscape as it will affect contributions as citizens to the social and economic aspects of society. Digital competence can be defined as the users' aptitude in the use of ICT to

access, evaluate, and understand information and communication with others online using a variety of digital tools (Ferrari, 2012). Digitally literate students have a varied skillset such as problem–solving, reflective thinking, collaborative and technical skills that contribute to success in dynamic and changing learning environments. Digital competence is one of eight key competences for lifelong learning according to the European Union (Ala-Mutka, 2011) and many countries are implementing strategies and programmes to increase digital competency of students in schools (Hatlevik, 2013). The Creative Learning Centres work collaboratively with schools across NI offering support and training in digital literacy through the creative use of media and technology to help increase student engagement and achievement and prepare for future working life (Future Classrooms, 2015). Strategy groups were also established by the Department of Education, NI as early as 1996 to prepare and expose students to new technologies.

Historically the concept of a digital divide originated as a gap between those with access to digital technologies and those without, a partition by race, gender and income in the use of technology (Bolt & Crawford, 2000). A subsequent digital divide emerged at the turn of this century between computer and internet use regarding range and quality of use, the information versus recreational divide (Wei & Hindman, 2010). Digital natives a term popularised by Prensky (2001), and other terms such as the net generation, generation Y and generation X were those used to describe the generation of digital technology users born after 1980; the technology-savvy student with flexible and mainly uninhibited access to information and communication technologies both inside and outside of the educational environment (Hosein et al., 2010; Lorenzo et al.,

2007; Prensky, 2001). The term digital immigrants emerged with reference to those who encountered technology at a later age (Kennedy et al., 2010).

Over the past decade the existence of 'digital natives' versus 'digital immigrants' has been widely discredited in literature (Kirschner & De Bruyckere 2017; Lai & Hong, 2015). Kennedy et al.'s (2010) study did not find a large gap in technology knowledge between the termed 'digitally savy' (the student) and the 'digital immigrants' (the tutor) and Kruger and Bester (2014) argue that not all students entering HE have the same level of proficiency in technology use. Jones et al. (2010) argue that although this is a more technologically integrated society the so-called 'net generation' with a presumed high level of technological skill does not exist. There has been a number of reports highlighting that not all young people from the termed 'net generation' are proficient in the use of digital technologies (Attewell & Hughes, 2010). There is a lack of empirical evidence and theoretical approval demonstrating that the so-called 'Net Generation' have an enhanced understanding of technology for academic and information gathering purposes (Bennett et al., 2007; Kennedy et al., 2010). In fact as a result of their study, within the Transmedia Literacy Project (European Union), Masanet et al. (2019) suggest a new term entitled 'digital apprentice' as they found that users presented different transmedia skills and at different levels of skills.

It is well documented that before entering third level education many students have used digital technologies regularly, particularly through the use of social networking technologies and IM (Lai and Hong, 2015). Lim et al. (2010) purport that although use of social networking sites are part of this generations daily routine, they have not yet successfully been proven to be useful for learning purposes. Many students also utilise a variety of applications and are at ease with

the use of personal wireless devices; however, many are not familiar with software and applications used for teaching and learning (Lorenzo et al., 2007). UK HE institutions have integrated and employed ICT at varying levels (Caird & Lane, 2015). This can be due to a wariness of embracing the use of technology in the classroom (Liaw, 2007). It is vital that educational establishments support users in the acquisition of digital literacy not only to enhance the student experience but for their future careers (Lorenzo et al., 2007). It has become increasingly important that teachers and lecturers adopt and use in a pedagogically sound way, information and communication technologies to enhance digital skills essential in the 21st century workplace (Boulton & Hramiak, 2014).

Lorenzo's (2016) study found that deep learning can only occur using mobile technologies when learners possess digital literacy skills. However, if the student is hesitant to engage with new technologies, then this will have an impact on the development of student digital skills (Pechenkina & Aeschliman, 2017; Thompson, 2013) are suspicious of the existence of a breed of digital native learners with adequate and effective digital literacy skills. The empirical evidence gathered in this research study provides important data on upper-sixth and first year undergraduate student attitudes and understanding of digital skills related to the use of mobile device and technologies for learning.

The Concept of Information Communication Technology

Information Communication Technology (ICT) is an interdisciplinary science mainly concerned with the collection, manipulation, classification, storage, retrieval and dissemination of information. According to Ezekoka (2017), ICT is a means of receiving or accessing, transforming, processing,

storing and sending ideas, perception or information through computer and their telecommunication facilities. Abimbade (2016) also viewed ICT as a concept, method, function, process or system of collecting, analyzing, processing and sharing of information using electronic equipment. ICT includes all that isinvolved in modern communication satellites, television, radio, video, tape recorders, floppy diskettes, compact discs, personal computers and other related equipment so that, the output generated can get to the user in good time and at reasonable cost to the overall benefit of mankind.

Developments in ICT such as the World Wide Web, electronic mail and Electronic data interchange can be seen as facilitators to cross organizational boundaries when dealing with information intensive processes (Hengst and Sol, 2011). Liverpool (2012) points out some of the uses of ICT in teaching and learning to include; ICT as objects, ICT as an assisting tool, ICT as a medium of teaching and learning, and ICT as a tool for organization and management in schools. ICTs allow learners to explore and discover rather than just listen and remember (Tinio, 2013).

Several reports and studies in recent years have placed emphasis on the potentials and opportunities of ICT for improving the quality of education. ICT is perceived as a "major tool for the construction of knowledge societies" (UNESCO, 2003) and significantly as an instrument at the educational level that can offer a way to restructure the educational systems and processes, resulting in quality education for all.

Additionally, in Europe, appropriate use of ICT is seen as a main factor in attaining quality education. In view of this, the European Commission is encouraging the use of ICT in learning through its eLearning Action Plan. One of

the specific objectives of the action plan is "to improve the quality of learning by facilitating access to services and resources as well as remote collaboration and exchange (CEC, 2011). A study by Bakar et al., (2010) examining secondary school student's motivation in using technology in teaching and learning mathematics, found out that technology could be used to motivate students in their teaching and learning activities.

To prepare the students for the challenges of the 21st century workplace and community leadership, the integration of information communication technology into teaching and learning process becomes inevitable. Also lecturers must be supported in the preparation of students" classroom use of technological tools and applications so that they can create learning environments that enable students to become responsible for their own learning and also focus on process and outcomes specifically for their individual learning states and needs. Adekunle (2017) stated that students" ability to speak, write and analyze information can be enhanced as part of their individual and personal growth through ICT. Furthermore, Adekunle (2017) added that teachers should emphasize the many benefits they derive from the use of ICT as productive tool in developing their own instructional materials and managing classroom and student information, in order to motivate their colleague teachers and students as well.

The application of ICT in teaching and learning makes learning more productive and efficient as it facilitate pedagogical activities of teachers and academic performance of students. For instance, e-learning has become one of the most common means of using ICT to offer learning opportunities to students, both on campus and off campus through online teaching via web-based system (Yusufu, 2015). Also, ICT allows teachers and students to contribute, control and

manipulate information in teaching and learning environments with the use of interactive books, journals among other resources that are usually available on the Internet (Oxfarm Educational Report, 2018).

Researchers are also able to lay their hands on varied and counter opinion information of other researchers in other parts of the world to aid their work through the use of ICT. Colwell (2010) briefly pointed out the potential of ICT in research when she noted that: No field of research will be left untouched by the current explosion of information and communication technologies. Science for instance, used to consist of theory and experiment. But today it has computer simulation as a third element which links the other two. ICT can lead lecturers into new frontiers in basic and fundamental research. ICT is relevant to lecturers and students in many areas of research.

According to Colwell (2010), ICT facilitates dissemination of information and communication from one person to another through e-mail, mail lists, newsgroups and chat rooms. These ICT resources facilitates communication between scholars as they can post research, books, journals, assignments, lists of referencesto on-line materials among others. Problems and solutions can be discussed among researchers, and scholars can respond to the work of others in an electronic manuscript through the use of ICT. ICT offer greater chances for research collaboration and networking among scholars across the globe, thus national and international aspect of research issues can be studied since they can allow for communication with experts and peers around the world. Through collaborative knowledge building, studies can highlight transnational trend analysis through human and instrumentation collaboration.

Colwell (2010) asserted that, ICTs can support research in any discipline as they offer faster and easier access to extensive and up-to-date information through digital libraries that provide digitized full-text resources to learners and researchers. Others are the electronic list, thus a directory of professional and scholarly e-conferences containing topics and articles relevant to researchers, and virtual libraries or electronic reference desks. Others include electronic books, journals, catalogues and image database. Other Internet resources, like CD-ROM and gopher can provide a researcher with current and in depth information.

Colwell (2010) asserted that, ICT can be used for data manipulation and analysis and can also be used to do complex statistical and mathematical calculations which are important in research. ICT enhance the completion of data on time and enhance the swift performance of statistical analysis. In fact, complex statistical analyses are not only performed instantaneously but also more accurately than possible manually. ICT offer researchers ready means for the dissemination of research findings and reports. ICT also offer ready avenue for the production of research reports. Publication outlets include e- journals, ebooks or through personal web-sites. Furthermore, digital video, audio, interactive software, asynchronous and synchronous chats, software simulation, social media among others, bring dynamism in describing a method or reporting result (Middleton et al, 2011).

Computer Technology usage in Classroom Instruction

Integrating ICT into teaching and learning is the process of determining the kind of products and processes of ICT appropriate for a given teaching and learning situation and problem (Ifegbo, 2015). With regard to the use of ICT for teaching purposes, the lecturer is expected to acquire competencies and expertise

on how to utilize ICT for effective lesson delivery. In the teaching and learning process, the student, the teacher, the curricular contents, the methods and the specified objectives all interact in the teaching and learning process to achieve the expected result

According to Ukwungwu (2014), the integration of ICT into the curriculum demands the availability of teachers who are knowledgeable in ICT tools and its application and these teachers are trained teachers with expertise in computer operations and developing of suitable software. The ability of the teacher to set up the ICT tools correctly influences how the teacher uses these ICT tools in the teaching process. When a teacher is able to blend the selection of appropriate tools with the appropriate strategies and activities to teach ICT enhanced lessons, learning also becomes easy to be achieved as explained by Graham (2011).

Ukwungwu (2014) further asserted that most developing countries of the world are lagging behind in science education delivery due to their inability to utilize ICT resource in their teaching and learning. However, effective utilization of ICT resources in teaching and learning cannot be successful without the training of both teachers and students to acquire technological knowledge on the functions and application of ICT tools in their teaching and learning activities. Within a very short time, ICT has become one of the basic building blocks of modern society. Understanding and mastering the basic skills and concepts of ICT has become part of the fundamentals of education, alongside writing, reading and numeracy (UNESCO, 2002). In view of these, Agyei and Voogt (2012) suggested some guidelines for teachers to develop a more competent approach to integrating ICT in the classrooms. These guidelines include; creating

collaborative teams where teachers can work in a team to formulate ICT related lessons and solve ICT related problems; creating ICT curriculum materials that will inspire teachers to learn; organizing orientation programs in the form of in-service training and other professional development program to enable teachers to acquire both theoretical, pedagogical and technological knowledge in their subject area; and putting in place a user-friendly technology for easy adaptation for both teachers and students to easily integrate ICT into their teaching and learning activities (Agyei & Voogt, 2012)

Kennewell, Parkinson and Tanner (2010) also in their review, added that for a school to successfully develop ICT capabilities, the various aspects have to be observed;

1. Students must be trained to use ICT to develop an attitude of planning, describing, applying and evaluating their tasks.
2. A healthy school ICT culture in teaching and learning has to be cultivated with dominant use of ICT in the school to enable teachers and students to develop skills in applying ICT in their teaching and learning activities.
3. Teachers should develop their students ICT skills by purposefully assigning them with ICT related assignments.

Kennewell, Parkinson, and Tanner (2010) concluded that the more the level of ICT capability of teachers and students are developed, the more potential for the application of ICT in teaching and learning. This implies that increase in training will increase the ability of teachers and students to use ICT in their teaching and learning activities which will in turn increase frequency of use of ICT for teaching and learning.

Carlson and Gaido (2012) concluded that ICT and teacher professional development is the best address in a context where the educational reform embraces a shift from a teacher-centered, lecture-based instruction towards interactive, students-centered and constructivist learning. More concretely, teachers‟ professional training in the use of ICT needs to combine presentations as well as small-group discussion, individual as well as collaborative activities, and creating opportunities for teachers to reflect on their actual use of ICT in the teaching process (Carlson & Gaido, 2012). Voogt (2010) added that additional motivation and incentives to participate in professional development practices especially in the incorporation of ICT in the teaching and learning process should act as a major requirement especially for teachers who are reluctant to change their teaching styles.

Saret (2011) describes this present era and a revolution in which the computer is the agent which transforms the way we do business, communicate with each other, and live. According to her the rapid changing of the world is a result of computers, and the computers are making a considerable impact on how we work. With regard to the use of computer for teaching and learning, it is sometimes seen as a teacher and as a tool in teaching, appropriately computer in teaching is classified as a teaching device because computer cannot replace a teacher but rather it can serve as a device or platform through which the teachers‟ prepared lessons are delivered. Computer as a device for teaching is used to aid teaching in the form of drills and practice, tutorials and dialogue, simulation and games and as subject of instruction while as a learning resource, it is used in information processing, data collection and analysis, data retrieval resources and computer mediated communication.

The Concept of Self-efficacy

The importance of self-efficacy as a key factor among students in achieving academic excellence is becoming increasingly understood. Self-efficacy research explains how and why individuals perform differently at various tasks within a range of complex environments including academic and computing performance domains (Miltiadou & Savenye, 2013). Bandura (1986), credited with introducing the concept of self-efficacy in the area of social psychology defined self-efficacy as a conception that one nurtures about his/her own personal beliefs in one's capabilities to achieve a given level of performance". Similarly, Lee and Mendlinger (2011) defined self-efficacy as a personal perception on the capability to perform a particular task. Self-efficacy can also be seen as the confidences that people have in their ability to perform a particular task. Thus, Sharma and Nasa (2014) defined self-efficacy as an individual's confidence in his or her ability, which may impact the performance of a task. Therefore, self-efficacy is the belief in one's capability to execute the actions required to attain a goal, and, as such, is an attribute of confidence/self confidence. Confidence in one's ability directly affects once performance. It is "simply a self perceived measure of one's belief in one's own abilities, dependent upon contextual background and setting (Leigh, 2008:8).

Self-efficacy reflects an individual's confidence in his/her ability to perform the behaviour required to produce specific outcome and it's thought to directly impact the choice to engage in a task, as well as the effort that will be expended and the persistence that will be exhibited (Singh, 2011). In other words, self-efficacy is the confidence in one's ability to perform in such a way as to produce a desirable outcome (Heng & Mansor, 2010). Unless people believe that

their actions can produce the outcomes they deserve, they have little incentive to act or to persevere in the face of difficulties (Sharma and Nasa, 2014:58). However, Zulkosky (2009:98) noted that "self-efficacy is not concerned with specific skills one has but rather with the judgments of what a person can do with those specific skills". It is necessary to emphasise that self-efficacy is not assessing the strength of skill; rather, it reflects personal judgement on the actual application of the skill. Self-efficacy beliefs determine how long individuals will persevere and how resilient they will be in the face of difficulties and how much effort they will expend on an activity. Individuals with a high self-efficacy perception expect to succeed and will persevere in an activity until it is completed (Kinzie et al., 2014). Contrary, an individual who possesses low self-efficacy is less expected to persevere doing challenging activities.

In some research studies that associate self-efficacy perception with performance, it has been claimed that people with higher self-efficacy perception are more successful in overcoming the obstacles with passion and resolution (Umay, 2011). In relevant literature, there are some research studies indicating that self-efficacy perception involves cognitive processes, feelings and controllable behaviours (Çetin, 2008; Zulkosky, 2009). In addition, self-efficacy has an effect on the way a person acts properly or wrongly and the level of perseverance in coping with the problems (Akkoyunlu & Orhan, 2013), and that students with lower self-efficacy levels shall keep themselves distant from learning situation or task (Schunk, 2010). It is generally a belief that: self-efficacy is influenced by four main sources: an inactive mastery experience that is, hands on experience; vicarious experiences, that is, other people's experience; verbal persuasion, that is, appraisal or feedback from others; and physiological

and affective states, that is, stress, emotion, mood, pain, and fatigue (Sharma and Nasa, 2014:61).

In academic settings, self-efficacy is seen as a strong predictor that could positively enhance academic performance of students. Askar and Davenport (2009:26) noted self-efficacy is especially important, and potentially useful, when the context relates to education. This is because the self-efficacy theory recognises also that an individual's actual performance influences their self-efficacy, and hence can affect any future performances.

Odaci (2011) articulated that "students' belief in their academic self-efficacy and their ability to begin and continue their studies is also highly important" (p. 110). Self-efficacy in education is regarded to be interconnected with effort, perseverance and accomplishment. Sharma and Nasa (2014) noted that, for the past two decades, self-efficacy has proven to be highly active predictor of students' motivation and learning. Academic self-efficacy is rooted in self-efficacy theory. The theory emphasises personal self-confidence on one's ability to handle and execute a given course of action in finding solution to a problem (Eccles & Wigfield, 2002). Based on this theory, the present study presumes that self-efficacy provides the basis for students' motivation and academic accomplishments through the aptitude within the background circumstance to modify or adapt through emotional and physiological changes.

Most studies on self-efficacy in an academic setting around the world have shown that the variable has a direct correlation to academic performance (Schunk, 2010; Zhang, Li, Duan & Wu, 2011; Robbins, Lauver, Le, Davis, Langley & Carlstrom, 2014). It has become an important factor required by students generally for academic performance. Therefore, students should develop

a wider sense of self-efficacy to maintain the persistent effort required to excel academically. The correlation linking self-efficacy and academic attainment has been a theme for academic discourse in social sciences research. To highlight the significance of self-efficacy in academic performance, Artino and Stephens (2016) carried out a study to determine if 'students' self-efficacy was associated with their self-reported use of cognitive and metacognitive learning strategies in online courses. The subjects used for the study were 32 graduate and 64 undergraduate students in a public university in the Northeastern United States. Findings showed that selfefficacy was found to be interconnected to students reported utilization of elaboration, critical thinking and metacognitive self-regulation. This is a preposition that "a student who believed they were capable of learning was more likely to report the use of cognitive and metacognitive strategies" (Artino & Stephen, 2016).

Also, Bong (2014) assessed academic self-efficacy performance-approach as well as performance avoidance achievement goal orientations in reference to English language and general school learning. The participants used for the study were 389 Korean high school girls. The results showed that academic self-efficacy perceptions were correlated moderately, whereas performances approach and performance avoidance achievement goal orientations displayed a strong correlation across different contexts. In another study conducted in Spain (Nunez, Gonzalez, Gonzalez-Pienda, Rodriguez, Rosario, Munoz Casavid & Cerezo, 2009), the researchers focused on investigating the relationship between university students' self efficacy for performance and learning as well as their effort regulation. The study indicated that when students possessed a higher self-efficacy, they were more likely to invest more effort into their academic studies.

Also, Turner, Chandler and Heffer's study (2009) investigated the influence of parenting styles, achievement motivation and self-efficacy on college students' academic attainment. The results indicated that self-efficacy was a consequential predictor of one's academic attainment. Therefore, self-efficacy has been established to be responsive to subtle changes in academic success.

Adeyemi et al. (2017) noted that efficacy optimism differs in level, strength and generality. This diversity proves essential in determining a suitable dimension. In academic settings, a self-efficacy measurement scale might be designed to assess students' confidence in solving specific problems, accessing various sources of information, as well as accomplishing a particular task. The role of self-efficacy has been investigated in correlation to apparent ability and explicit academic performance (Folk, 2016).

Conceptual Framework

Independent Variable

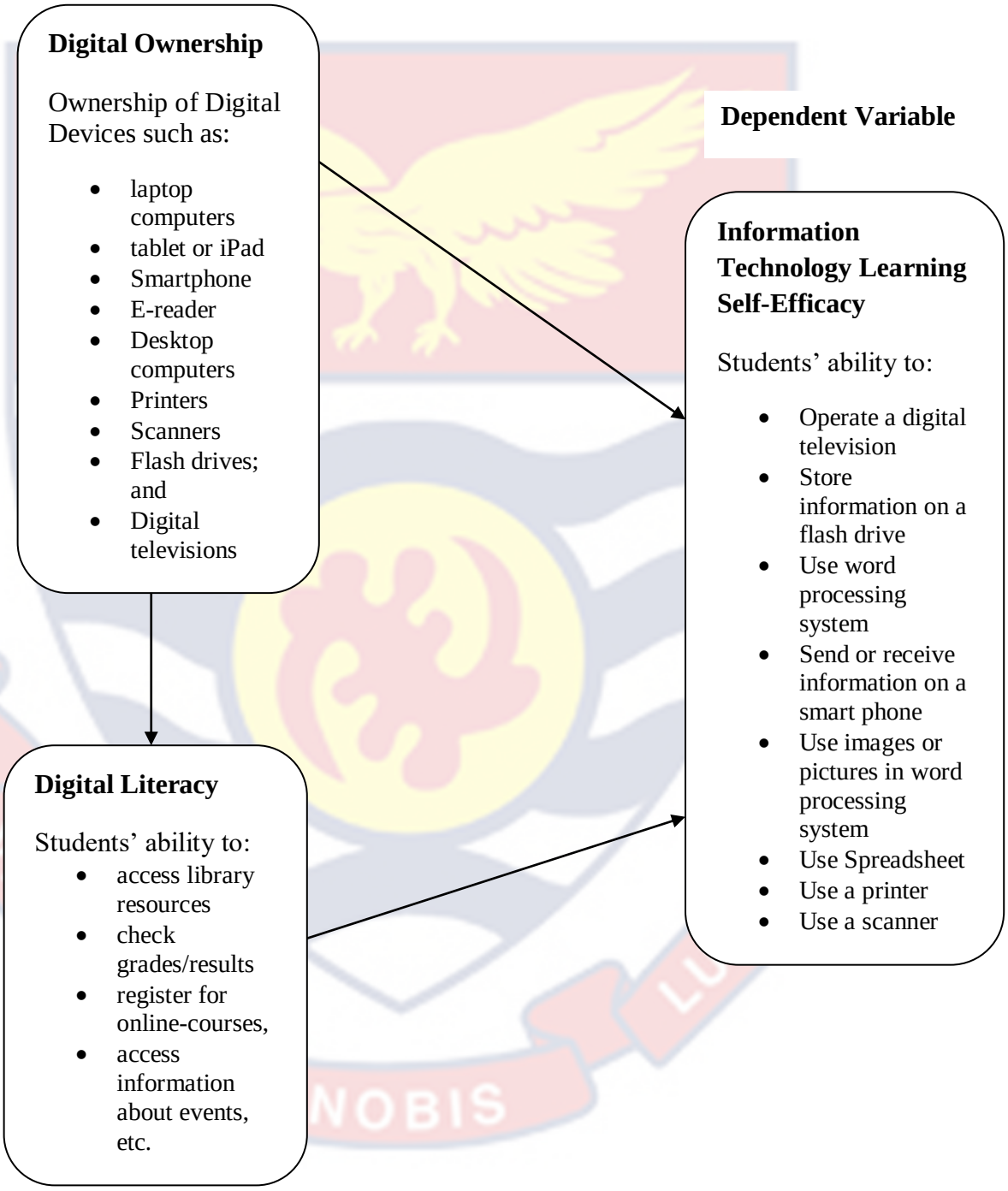

Figure 1: Conceptual framework on digital ownership, digital literacy and information technology learning self-efficacy among students

Source: Author's Own Construct (2023)

Conceptual framework represents researcher's synthesis of literature on how to explain a phenomenon. Thus, the researcher's "map" in pursuing the investigation and how the research problem would be explored. According to Imenda (2014) and Regoniel (2015), conceptual framework maps out the actions required in the course of the research given the researcher's previous knowledge of other researchers' point of view and his observations on the subject of research. Based on the social cognitive theory (1977) by Albert Bandura, a conceptual framework has been developed for the current investigation.

Figure 1 shows the conceptual framework of digital ownership, digital literacy and information technology learning self-efficacy among students. The conceptual framework contains three (3) key variables: Digital Ownership (DO); Digital Literacy; and Information Technology Learning Self-Efficacy (ITLSE). The framework shows how information technology learning self-efficacy is influenced by a number of variables such as: Digital Ownership (D) and Digital Literacy (DL). The independent variables (Digital Ownership (DO) and Digital Literacy (DL) of the study may influence the dependent variable (information technology learning self-efficacy) of the study.

From Figure 1, digital ownership (i.e. ownership of digital devices such as laptop computers, tablet or iPad, Smartphone, E-reader, desktop computers, printers, scanners, flash drives and digital televisions) influences both digital literacy skills of students (i.e. ability to access library resources, check grades/results, register for online-courses, access information about events, student activities and club/organizations, read e-texts, communicate with other students about class related matters outside class, etc) and information technology learning self-efficacy (i.e. students' ability to: operate a digital television, store

information on a flash drive, use word processing system, send or receive information on a smart phone, use images or pictures in word processing system, use Spreadsheet, use a printer, use a scanner, etc) among students. Again, digital literacy skills of students (i.e. ability to access library resources, check grades/results, register for online-courses, access information about events, student activities and club/organizations, read e-texts, communicate with other students about class related matters outside class, etc) may also affect the information technology learning self-efficacy (i.e. students' ability to: operate a digital television, store information on a flash drive, use word processing system, send or receive information on a smart phone, use images or pictures in word processing system, use Spreadsheet, use a printer, use a scanner, etc) among students.

Empirical Review

Impact of Digital Learning Tools on Self-efficacy

While digital technology has been in development for decades, its implementation in education is relatively modern, at least at its current level of infusion. The primary focus of research around technology's impact on learners has, understandably, been focused on academic success. Unfortunately, there is comparatively little research exploring the link between digitally infused classrooms and their impact on learner self-efficacy, motivation, and ownership of learning. Rovai and Jordan (2014) point out that distance education, a sect of modern education that is foundationally designed using digital technology, including robust learning management systems (LMS's), and smaller digital learning tools that might include social media and other applications, requires that learners be self-motivated. If a learner possesses a fear of technology,

common among adult learners or even younger learners whose lives are less impacted by digital technology, then they simply will not work toward conquering their digital shortcomings (Rovai & Jordan, 2014). Students and teachers display varied emotions when reacting to new educational technologies. These emotions include enthusiasm, paralyzing fear, and a whole host of emotions in between (Collins, 2019). This is troubling because Abrahamson (2018) reported that distance education required students who were self-regulated and independent. Learners who fear technology or those who fear change will likely struggle because they might not be motivated to overcome their fears and discomforts.

Digital Learning Tools' Impact on Ownership of Learning

Similarly, motivation in learners is associated with attitude, which stems from classroom culture. Many definitions of culture exist, as it is a vague title. If it can be assumed that culture includes engagement and self-efficacy and that these lead to ownership of learning, then Vanwynsberghe (2013) suggests social media literacy greatly impacts these factors.

While investigating the qualities of school culture in urban elementary schools, Sahin (2011) postulated that systems in education (be it assessment, school culture, policies, etc.) that become stagnant are problematic. Educators' duties ought not be to create new instructional methods and techniques. Instead our duties are to question the status quo and to foster new ideas as they arise naturally (Johnson & Johnson, 2019).

In addition to breaking down figurative classroom walls and inviting students to demonstrate their learning to a global audience, researchers have observed academic benefits to using digital learning tools (Jain & Getis, 2013;

Nam & Smith-Jackson, 2017). Specifically, Jain and Getis's (2013) experiment in which half of the participating students experienced online instruction, while the rest encountered the same material using traditional classroom methods revealed that internet-based instruction methods were viable and even more academically beneficial. The integration of digital learning tools enhances learning on many levels, including academic results, and could soon become a recognizable and key component of student success (Neo, 2013; Wallace, 2014).

Motivation for academic success, however, is not a component of ownership of learning. As defined previously, ownership of learning is a sincere desire to explore for the sake of satisfying one's curiosity. The term inquiry is often used synonymously. In their study of school culture, Akkan, Guven, and Cakiroglu (2012) suggest that technology may be a key factor in developing a culture that fosters ownership of learning. Using digital learning tools in classrooms may make it easier for students to value curricular content and might motivate them alongside their academic goals.

Flipped or blended classrooms that primarily use a variety tech tools to deliver and explore content, tools such as video, PowerPoint, and online discussion forums, may help to spark learners' interests. These alternative approaches to the traditional stand-and-deliver model which often lacks technology, give students a sense of freedom that boosts the desire to learn (Goodwin & Miller, 2013). "A review of literature has shown that flipping learning can improve student's academic achievement, promote self-paced learning, and increase student–teacher interaction" (Chen, 2016, p.412). Existing research on this topic may be limited, but it does suggest that digital learning tools may impact ownership of learning.

Impact of Gender on ICT and Digital Literacy

Differencial Impact of ICT on Gender Despite the importance of ICT in students learning and the perceived gender difference in ICT usage and competence, not much research hasbeen done in Ghana to ascertain the level of these differences among students in second cycle institutions and colleges. According to Kay (2007), many children mostly in the developed world, start interacting with computers at three or four years of age; gender-based socialisation begins even earlier, at the moment when someone asks, Is it a boy or a girl? A critical question arises as to whether computer behaviour is influenced by gender. If computers play an increasingly prominent role in our society, one could argue that significant power and success rest with those who know how to use this technology effectively. It is vital that boys and girls have equal opportunity to work with and benefit from computers.

Becta (2018) carried out a study to explore the differences between boys and girls use of ICT both within and outside school, and for both educational and leisure purposes. According to the report, the use of ICT in education improves the motivation and attainment of both girls and boys, although the increases were more marked for boys than girls. The study explained that, most girls use ICT more for school work, whereas boys use it more for leisure purposes. Girls also prefer social (popular on online social networking) and creative uses of ICT than their boys counterparts. They also like to work collaboratively and enjoy using technology to learn in both formal and informal contexts compared with boys. The report revealed further that, girls are more dependent than boys on school for their access to ICT and for guidance on how to use it while boys had a greater experience of using ICT at home. According to the report, there was evidence to

suggest that, ICT does have positive effects on the attainment of both genders, it however, seems to have a greater positive effect on boys than it does on girls.

Jones et. al. (2010) conducted a survey study of 40 U.S. education institutions to learn about whether race and gender made a difference in internet usage among college students. The findings of the study suggested that, male college student Internet users spend more time online than female college student Internet users. The male college students spend greater amounts of their time pursuing a wide variety of leisure activities online including listening to and downloading music, watching and downloading videos as well as playing games than females. The study further revealed that female college students tend to use the internet for communicative and academic purposes more frequently than do their male counterparts. The study also found that, among the most frequent uses of internet online, communicating socially ranked first for females and second for males. This corroborates Becta (2018) assertion that girls generally prefer social and creative uses of ICT than their boys' counterpart.

Valentine and Pattie (2005) carried out a survey to find whether there were gender patterns in relation to the purpose of ICT use by students. The study found that, the majority (61%) of boys were more likely to report use of the computer for games than (39%) girls. This finding according to Valentine and Pattie (2005), corroborate numerous other studies that have all suggested that computers are boys' toys and therefore seems to favour boys than girls. A study by Reidulf et al. (2008) on gender profiles of internet and mobile phone use among Norwegian adolescents showed that, chatting and e–mailing were used more by girls than boys. It further revealed that, more girls (59.9 %) than boys (50.7%) used the internet for chatting while boys (36.3%) played games

compared with 17.6%girls. On mobile phone usage, Reidulfet al. (2008) found that, 99.4% of girls reported using their mobile phone for text messaging (SMS), while 97.5% of the boys did so.

Dzapkasu (2015) indicated that, but for the demand for job on the job market and their desire to be employable, most women will not learn ICT. According to the study, most women view computer task as being too complex. The study adds that, boys easily talk about themselves as computer proficient and tended to express themselves in terms of self-confidence, even when they were not than girls.

Hew and Leong (2011) conducted a study to find gender difference among pre-university students in Malaysia. The study found no significant gender differences in eight out of nine ICT competencies; however, the male students were slightly higher in mean score in all the ICT competencies except word processing competency where female students had a higher mean score. According to the study females were perceived as better typists and tended to use more word processing applications compared to their male counterparts.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter deals with the research design, population, sample and sampling techniques, research instruments, validity and reliability of the instruments, data collection procedures, data analysis procedures and ethical considerations.

Research Design

The study employed a descriptive research design in making a quantitative inquiry to determine the influence of digital device ownership and digital literacy on information technology learning self-efficacy of junior high school students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. According to Amedahe (2004), descriptive research design specifies the nature of a given phenomenon and explains that descriptive research design involves the collection of data in order to answer research questions concerning the current status of the subjects of the study. In the context of this study, the design helped to quantify data that was collected on digital device ownership, digital literacy and information technology learning self-efficacy among junior high school students. According to Murphy (2009) the major advantage that goes with this type of design is that, the data collection techniques present several advantages as they provide a multifaceted approach for data collection. For example, a descriptive research design can provide statistics about an event while also illustrating how people experience that event. Again, Murphy states that the descriptive research design also offers a unique means of data collection thus it provides more accurate picture of events and seeks to explain peoples'

perceptions and behaviour on the basis of data gathered at a point in time (Murphy, 2009).

However, the design has some weaknesses. Confidentiality is the primary weakness of descriptive research (Murphy, 2009). According to Murphy (2009) respondents are often not truthful as they feel the need to tell the researcher what they think the researcher wants to hear and also participants may refuse to provide responses they view to be too personal. Another weakness of this design, according to Murphy (2009) is that it presents the possibility for error and subjectivity. However, the design would be used despite its weaknesses because it seeks to explain people's perceptions and behaviour on the basis of data gathered at a point in time and can provide statistics about an event while also illustrating how people experience that event thus providing a multifaceted approach for data collection.

Population

The population of the study included all junior high school students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis during the 2022/2023 academic year. There were 84 JHS 3 pupils at the Ayifua St. Mary's Anglican Basic School as at the 2022/2023 academic year (Central Region Educational Directorate, 2022).

Sample and Sampling Procedures

In determining the sample size for the study, the table for determining sample size from a given population suggested by Krejcie and Morgan (1970) was used. This table suggests appropriate sample sizes for various populations. According to the table the sample size that can be a good representation of a population of 84 is 70. Therefore, 70 JHS 3 pupils in the Ayifua St. Mary's

Anglican Basic School were sampled for the study. Table 1 presents the Krejcie and Morgan (1970) table for determining a sample size from a given population.

Table 1: Table for Determining a Sample Size

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

The simple random sampling technique was employed for this study. The simple random sampling technique was used in order to provide each of the JHS 3 pupils an equal chance of being selected. Specifically, the lottery method was used to select the JHS pupils to participate in the study. In doing so, 70 "Yes" and

14 "No" were written on pieces of papers, folded and placed in a basket. Each of the pupils in JHS 3 were made to select only one of those papers. Those who selected "Yes" were made to respond to the questionnaires.

Data Collection Instrument

The questionnaire was used to collect data. Questionnaire is described as structured instrument for gathering data from a potentially large number of respondents, within a shorter possible time when especially the population is easily accessible (Deng, 2010; Amedahe & Gyimah, 2008). The reasons for the choice of the questionnaire were that, the respondents (JHS 3 pupils) were literates who could read and write, therefore, a questionnaire as a tool for data collection could be used. Also, questionnaires are less expensive than other methods such as interview and observation, and provide a wider coverage of respondents. Again, questionnaires offer greater assurance of anonymity to respondents who wanted to remain unknown.

The questionnaires comprised of close-ended items. The close-ended items are easier and quicker to answer (Deng, 2010). More so, they require no extensive writing hence, quantification would be straight forward. This means more questions can be asked within a given length of time (Bhandarkar & Wilkinson, 2010).

The questionnaire for the JHS 3 pupils was structured into four sections (A, B, C & D) consisting of 35 items. Section A comprised two items that elicited students' background characteristics. Section B comprised items that collected data on students' information technology learning self-efficacy (14 items). Section C contained nine items that elicited responses on students' digital ownership while section D consisted of 10 items eliciting responses on students'

digital literacy skills. Apart from the section C which was drafted on a "yes" and "no" response, the remaining sections (sections B & D) were on a five-point Likert scale (1 = Not at all; 2 = To a low extent; 3 = To a moderately high extent; 4=To a high extent; and 5 = To a very high extent).

Validity and Reliability of the Instrument

Validity

Both construct validity and content validity of the questionnaire were assessed. In assessing the construct validity of the questionnaire, items were developed from the reviewed literature. A large sample which is representative of the population was used in the current study. Objectives of the study were clearly spelt out to enable credible results. Also, the researcher designed a questionnaire with items that are clear and use the language that are understood by all the participants. The questionnaires were given to colleague students pursuing the same programme to comment on the questionnaire.

In assessing the content validity, the questionnaire was given to the research supervisor to check for errors and vagueness. The supervisor made comments regarding the ability of the questionnaire to measure what it is designed to measure which are the barriers to effective integration of computer technology into classroom instructions. Comments from the colleagues and the supervisor helped in granting the face and content validities of the questionnaire. Their comments helped the researcher to bring the questionnaires to standard.

Reliability

Pilot Testing of the Instrument

Before the study was carried out, the items on the questionnaire were tested to avoid ambiguity and for reliability. This was done through a pilot testing

that was carried out prior to the actual collection of the data. The questionnaires were given to a smaller number of participants with characteristics similar to the sample to be used in the main study. The school that was selected for the pilot study was not used again in the main study.

After the data of the pilot testing was collected, it was entered into the Statistical Package for Social Sciences [SPSS] (version 26) to check for the reliability co-efficient using Cronbach alpha level. A Chronbach's Alpha value of 0.73 was achieved for the students' questionnaire. According to Fraenkel and Wallen (2003), for a useful rule of thumb, reliability should be 0.70 or preferably higher. Thus, it can be said that, the instrument was good enough and capable of collecting useful and relevant data for the study.

Data Collection Procedures

Introductory letter from the College of Distance Education of the University of Cape Coast was obtained to seek permission from the school authorities and teachers. Four days from the day of presenting the permission letter was agreed upon by the researcher and school authorities for the administration of the questionnaires. Written consent forms were also given to the pupils to fill out in order to obtain their permission before they (pupils) were involved in the study. After permission was granted, preparations were made to administer the questionnaires on the approved date.

Questionnaires were administered personally by the researcher (February 14th & 15th, 2023). On the days of administration of the questionnaires, verbal consent was obtained from the participants. They were informed about the aim of the study and its educational significance. Clarifications on how to respond to the questionnaires were given to the participants. Seventy (70) questionnaires were

distributed to participants. In order to ensure a high return rate, the questionnaires were administered and retrieved on the same day.

Data Processing and Analysis

The coding of the items was done in line with the scale provided under each of the tables. This study sought to investigate the influence of digital device ownership and digital literacy on information technology learning self-efficacy of junior high school students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. To address the research questions formulated to guide the study, both descriptive statistics (e.g. frequencies, percentages, means and standard deviations) and inferential statistics (multiple regression analyses and independent samples t-test) were employed in the analysis of the data. Specifically, in using the descriptive statistics, frequency counts and simple percentages were used to analyse the demographic data of the respondents and mean and standard deviations were used in the analyses of research questions 1 to 3. Multiple regression analysis was conducted to analyse research question 4 while research question 5/hypothesis was analysed using independent samples t-test.

Ethical Considerations

Study ethics serve to protect the rights of research participants while also promoting the research's credibility (Israel & Hay, 2006). The following steps will be taken to ensure that research ethics are followed. Before being approached for data collection, it is critical that study participants are informed. To comply with this, consent of the respondents was sought for before they are involved in the study. In ensuring this, a consent form was given to the pupils to fill in order

to obtain their permission to be involved in the study. Participants in the research had the option to drop out at any time if they so desired. The research investigation observed anonymity and secrecy. The names of the participants were kept anonymous in this study, and the information gathered from the respondents was utilized for academic purposes.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The purpose of the study was to investigate digital device ownership, digital literacy and information technology learning self-efficacy of junior high school students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. Questionnaire (for students) was employed to gather the requisite data for the study. The data gathered with the use of the questionnaire was analyzed through the computation of frequencies, percentages, mean of means distributions as well as Independent samples t-test. Thus, both the descriptive and inferential statistics were employed in the data analysis of the responses gathered from the questionnaire. This chapter presents the interpretations discussions and inferences that were made from the output.

Analysis of Data from Respondents

Table 2 shows the characteristics of junior high school students in the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis in the Central Region of Ghana, who served as respondents for the study.

Table 2: Characteristics of Students

Variable	Subscale	No.	%
Gender	Male	34	48.6
	Female	36	51.4
Age	10-13 years	22	31.4
	14-16 years	48	68.6

Source: Field Data, 2023

The data collection for the students achieved a 100% return rate (i.e. 70 respondents). From Table 2, out of the 70 JHS 3 pupils who were involved in the

study, 48.6% were males, whiles 51.4% were females. Many of the students were females. Again, with respect to the age of the students, 31.4% were between 10-13 years and 68.6% were between 14-16 years. It follows that a significant majority of the students were between 14-16 years. This is not surprising because the appropriate school age for JHS 3 pupils are ages 14-16 years.

Having analysed and discussed the socio-demographic characteristics of the students, the subsequent sections of this chapter is dedicated to examining the objectives and hypothesis that guided the study. This section presents the results and discussions of data collected to answer the five research questions and one (1) hypothesis formulated to guide the study. It comprised data from the questionnaires.

Level of Information Technology Learning Self-Efficacy among Students

Research Question 1: What is the level of information technology learning self-efficacy among students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?

The aim of this research objective was to find out the level of information technology learning self-efficacy among students. The responses given by the students are shown in Table 3.

Table 3: Level of Information Technology Learning Self-Efficacy among Students

Statements:	M	SD
I know how to operate a digital television.	4.77	.42
I know how to store information on a flash drive.	3.36	1.74
I know how to format a disk.	2.19	1.31
I know how to use word processing system.	3.71	1.12

I know how to use send or receive information on a smart phone.	4.29	1.39
I know how to use images or pictures in word processing system.	3.10	1.64
I know how to use Spreadsheet.	3.94	1.39
I know how to use a printer.	2.43	1.55
I know how to use a scanner.	2.14	1.37
I can code/I know a little coding.	1.74	.93
I know how to use Microsoft PowerPoint Presentation.	3.14	1.57
I know how to use computers in creating music.	2.77	1.37
I can use the digital technology to surf the internet.	4.17	1.27
I know how to use the digital technology to access my email.	3.46	1.34

Source: Field Data, 2023

Mean of means = 3.23

Mean of standard deviation = 1.32

Table 3 sought to find out the level of information technology learning self-efficacy among students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. The means and standard deviation were obtained based on the responses recorded for each of the items on the questionnaire that were given to the respondents. The computation was done with the use of the Statistical Package for Service Solutions version 21. The coding of the items was done in line with the scale provided under Table 3 (1= Not at all; 2=To a low extent; 3= To a moderately high extent; 4=To a high extent; and 5= To a very high extent). A mean of means of 3.23 and a mean of standard deviation of 1.32

were realized. Further discussions of individual items are presented in the paragraphs below.

From Table 3, a mean of 4.77 and a standard deviation of .42 were achieved for the statement: "I know how to operate a digital television". This means that, to a very high extent, students know how to operate a digital television. This finding contradicts that of Attewell and Hughes (2010) who assert that, the current generation are not all confident users of new and emerging technologies. Again, when the respondents were asked whether they know how to store information on a flash drive, a mean of 3.36 and a standard deviation of 1.74 were obtained for this item. So it goes that, to a moderately high extent, students know how to store information on a flash drive. Also, from Table 3, the students indicated that, to a low extent, they know how to format a disk. This is evidenced by the mean score of 2.19 and a standard deviation of 1.31 for this item. The mean is approximately 2 (to a low extent) according to the scale under Table 3. This finding is similar to that of Meyers et al., (2013) who assert that, the use of mobile devices alongside integrated applications and platforms can provide the user with experience to help promote and develop digital literacy in formal learning and informal learning contexts such as libraries, at home and in online spaces. Regarding the statement; "I know how to use word processing system", the majority of the students indicated "to a high extent" to the statement. This can be seen from the mean of 3.71 and a standard deviation of 1.12 that were realized. Thus, to a high extent, the majority of the students know how to use word processing system. A mean of 4.29 and a standard deviation 1.39 were recorded for the item "I know how to send or receive information on a smart phone". This means that, to a high extent, the majority of the students know how

to use send or receive information on a smart phone. This is because the mean falls on scale 4 (to a high extent) looking at the scale under Table 3 In line with this finding, several scholars (Mac Callum et al., 2014; Valék & Sládek, 2012) assert that, technology has become such an integral dimension in society where digital literacy has become essential to education, teaching and learning.

The finding depicts that, to a moderately high extent, most of the students know how to use images or pictures in word processing system. With a mean of 3.10 and a standard deviation of 1.64 it could be concluded that the mean falls into the scale of 3 (to a moderately high extent). Again, when the respondents were asked whether they know how to use Spreadsheet, they indicated "to a high extent". Here, a mean of 3.94 and a standard deviation of 1.39 were obtained for this item showing to a high extent, the respondents know how to use Spreadsheet. Regarding the statement; "I know how to use a printer", the majority of the students indicated "to a low extent". This can be seen from the mean of 2.43 and a standard deviation of 1.55 that were realized. Concerning the statement; "I know how to use a scanner", it was found out that a significant majority of the students indicated "to a low extent". A mean of 2.14 and a standard deviation of 1.37 were attained. Also, a mean of 1.74 and a standard deviation of .93 clearly indicate that, to a low extent, the students can code/know a little coding.

Again, the majority of the students indicated that, to a moderately high extent, they know how to use Microsoft PowerPoint Presentation. A mean of 3.14 and a standard deviation of 1.57 were attained for this item and this falls within the option 3(to a moderately high extent) when approximated to the nearest whole number looking at the scale under Table 3. In relation to this, UNESCO (2002) explain that, understanding and mastering the basic skills and concepts of

ICT has become part of the fundamentals of education, alongside writing, reading and numeracy. As to whether students know how to use computers in creating music, the majority of them indicated "to a moderately high extent". Here, a mean of 2.77 and a standard deviation of 1.37 were obtained for this item showing that, to a moderately high extent, the students know how to use computers in creating music. Also, from Table 3, the respondents indicated that, to a high extent, they can use the digital technology to surf the internet. This is evidenced by the mean score of 4.17 and a standard deviation of 1.27 for this item. The mean is approximately 4, showing that the respondents indicated "to a high extent" to the statement. This finding resonates with that of Barry, Murphy and Drew (2015) that, compelling reasons such as convenience of getting connected to educational resources via portable devices may not be the only reason for device ownership. Other reasons include students' ability to access news, calls, instant messaging, surfing, gambling, social media and data storage. Regarding the statement; "I know how to use the digital technology to access my email", the majority of the students indicated "to a high extent" to the statement. This can be seen from the mean of 3.46 and a standard deviation of 1.34 that were realized.

From the above discussions, it can be concluded that, the level of information technology learning self-efficacy among students was to a moderately high extent. This hinges on the findings that, to a moderately high extent, the students knew how to use computers in creating music; knew how to use Microsoft PowerPoint Presentation; knew how to use images or pictures in word processing system; and knew how to store information on a flash drive. Also, to a high extent, the students: knew how to use the digital technology to

access their email; can use the digital technology to surf the internet; knew how to use Spreadsheet; knew how to use send or receive information on a smart phone; knew how to use word processing system; and knew how to operate a digital television. However, to a low extent, the students: knew how to format a disk; knew how to use a scanner; and knew a little coding.

Ownership of Digital Devices among Students

Research Question 2: To what extent do students own digital devices at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?

The aim of this research objective was to find out the digital devices that students have/own. The views of students are shown in Table 4.

Table 4: Ownership of Digital Devices among Students

Statements:	Yes N(%)	No N(%)
Laptop computers	16(22.9)	54(77.1)
Tablet or iPad	24(34.3)	46(65.7)
Smartphone	31(44.3)	39(55.7)
E-reader	4(5.7)	66(94.3)
Desktop computers	8(11.4)	62(88.6)
Printers	-	70(100.0)
Scanners	-	70(100.0)
Flash drives	37(52.8)	33(47.2)
Digital televisions	28(40.0)	42(60.0)

Source: Field Data, 2023

The finding depicts that, most of the students did not have/own laptop computers. With this, 16 respondents representing 22.9% indicated 'yes' and 54 respondents representing 77.1% indicated 'no'. In line with this, studies (Sharples et al., 2014; Shelly, Gunter & Gunter, 2012) have held that student ownership regimes of new technologies such as computer, mobile devices and computer

applications are crucial in curriculum designs and delivery. Again, when students were asked whether they have/own tablet or iPad, the majority of them indicated 'no'. Here, 24 respondents representing 34.3% indicated 'yes' whereas 46 respondents representing 65.7% indicated 'no'. Also, from Table 4, most of the students indicated that they did not have/own smartphones. This is evidenced by the majority of the students (39, 55.7%) who indicated 'no' as against the minority (31, 44.3%) who indicated 'yes'. Similarly, the majority of the students did not have/own E-reader. This is because, 4 respondents representing 5.7% indicated 'yes' whereas 66 respondents representing 94.3% responded 'no'.

Regarding the item "Printers", all (70, 100.0%) unanimously indicated that they did not have/own printer as a digital device. In line with this, Sharples et al., (2014) asserts that, device ownership and use encourages "lecturer control" and self-directed learners. Similarly, it was realized that, all (70, 100.0%) the students did not have/own scanners as a digital device. As to whether students own/have flash drives, most of them agreed. With this, 37 respondents representing 52.8% indicated 'yes' and 33 respondents representing 47.2% indicated 'no'. Concerning whether students have/own digital televisions, 28 of the respondents representing 40.0% indicated 'yes' and 42 respondents representing 60.0% indicated 'no' to the statement.

From the above discussions, it can be concluded that, the students did not have/own most of the digital devices. With the exception of flash drives, which was the only digital device most of the students indicated that they had/owned, most of the students did not have/own the other digital devices such as: laptop computers; tablet or iPads; smartphones; E-readers; desktop computers; printers; scanners; and digital televisions.

Level of Students' Digital Literacy Skills

Research Question 3: What is the level of students' digital literacy skills at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?

The aim of this research objective was to find out the level of students' digital literacy skills at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. The responses given by the students are shown in Table 5.

Table 5: Level of Students' Digital Literacy Skills

Statements: I can use digital devices to …	M	SD
access library resources.	2.99	1.49
check grades/results.	2.29	1.72
register for online-courses.	2.60	1.65
access information about events, student activities, and clubs/organisations.	3.40	1.39
read e-texts.	4.06	1.34
communicate with other students about class related matters outside class.	4.37	1.21
look up information while in class or outside class.	3.54	1.38
capture statistic images of in-class activities or resources.	1.53	1.14
record my teacher's lesson or in-class activities (audio, visual, or both).	1.76	1.32
participate in interactive class activities.	3.70	1.13

Source: Field Data, 2023

Mean of means = 3.02

Mean of standard deviation = 1.38

Table 5 sought to find the level of students' digital literacy skills at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. The

means and standard deviation were obtained based on the responses recorded for each of the items on the questionnaire that were given to the students. The computation was done with the use of the Statistical Package for Service Solutions version 21. The coding of the items were done in line with the scale provided under Table 5 (1= Not at all; 2=To a low extent; 3= To a moderately high extent; 4= To a high extent; and 5= To a very high extent). A mean of means of 3.02 and a mean of standard deviation of 1.38 were realized. This means that, to a moderately high extent, the students were competent with digital literacy skills. Details of the individual items are presented in the paragraphs below.

From Table 5 a mean of 2.99 and a standard deviation of 1.49 were achieved for the statement: "I can use digital devices to access library resources". This means that, to a moderately high extent, students can use digital devices to access library resources. In line with this finding, researchers (Jain & Getis, 2013; Nam & Smith-Jackson, 2017) have observed academic benefits to using digital learning tools. Again, when the students were asked whether they can use digital devices to check grades/results, the respondents indicated "to a low extent" to the statement. Here, a mean of 2.29 and a standard deviation of 1.72 were obtained for this item showing that, to a low extent, the students can use digital devices to check grades/results. In line with this, Rovai and Jordan (2014) assert that, if a learner possesses a fear of technology, common among adult learners or even younger learners whose lives are less impacted by digital technology, then they simply will not work toward conquering their digital shortcomings. Also, from Table 5, the students indicated that to a moderately high extent, they can use digital devices to register for online-courses. This is evidenced by the mean score of 2.60 and a standard deviation of 1.65 for this item. The mean is approximately

3(to a moderately high extent) according to the scale under Table 5. Regarding the statement; "I can use digital devices to access information about events, student activities, and clubs/organisations", the majority of the students indicated "to a moderately high extent" to the statement. This can be seen from the mean of 3.40 and a standard deviation of 1.39 that were realised. Also, a mean of 4.06 and a standard deviation 1.34 were recorded for the item "I can use digital devices to read e-texts". This means that, to a high extent, the majority of the students can use digital devices to read e-texts. This is because the mean falls on scale 4 (to a high extent) looking at the scale under Table 5.

The finding depicts that, to a high extent, most of the students can use digital devices to communicate with other students about class related matters outside class. With a mean of 4.37 and a standard deviation of 1.21 it could be concluded that the mean falls into the scale of 4 (to a high extent). Again, when the respondents were asked the statement; "I can use digital devices to look up information while in class or outside class", they indicated "to a high extent". Here, a mean of 3.54 and a standard deviation of 1.38 were obtained for this item. From Table 5, a mean of 1.53 and a standard deviation of 1.14 were achieved for the statement: "I can use digital devices to capture statistic images of in-class activities or resources". This means that, to a low extent, the students can use digital devices to capture statistic images of in-class activities or resources. Again, when the students were asked whether they can use digital devices to record their teacher's lesson or in-class activities (audio, visual, or both), the respondents indicated "to a low extent" to the statement. Here, a mean of 1.76 and a standard deviation of 1.32 were obtained for this item. Also, from Table 5, the students indicated that, to a high extent, they can use digital devices to

participate in interactive class activities. This is evidenced by the mean score of 3.70 and a standard deviation of 1.13 for this item. The mean is approximately 4(to a high extent) according to the scale under Table 5.

It can be concluded that, the students, to a moderately high extent, the students were competent with digital literacy skills. This is because, to a moderately high extent, the students can use digital devices to: access library resources; register for online-courses; and access information about events, student activities, and clubs/organisations. Again, to a high extent, the students can use digital devices to: read e-texts; communicate with other students about class related matters outside class; look up information while in class or outside class; and participate in interactive class activities. However, the students could not use the digital devices to: check grades/results; capture statistic images of in-class activities or resources; nor record their teacher's lesson or in-class activities (audio, visual, or both).

Influence of Digital Device Ownership and Digital Literacy on Information Technology Learning Self Efficacy of Students

Research Question 4: What is the influence of digital device ownership and digital literacy on information technology learning self efficacy of students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis?

In this regression, dependent variable is information technology learning self efficacy and the independent variables are digital device ownership and digital literacy skills of students. The normality assumption was tested before the test was conducted. The normality test was conducted using the Q-Q plots and the result is shown in Figure 2.

Q-Q Plot Standardized Residuals

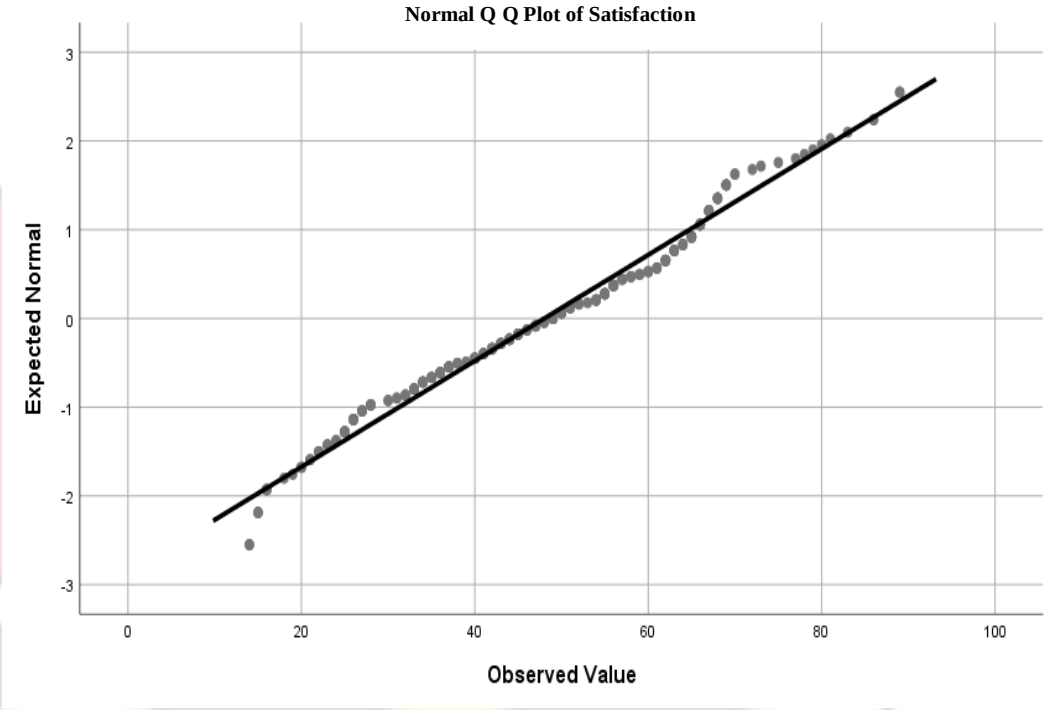

Figure 2: Q-Q Plot for Normality

The Q-Q plot shown in Figure 1 revealed that the data points are closer to the regression line. This depicted that the residuals for the variable work engagement is normally distribution and hence, the normality assumption was satisfied.

The analysis in Table 6 indicated that the autocorrelation assumption was not violated since the Durbin-Watson test yielded an estimate of 1.722 which fell within the range of 1.5 and 2.5 (Table 5). Also, all the VIF estimates were below 2.5. This suggested that multicollinearity was low and thus, the multicollinearity assumption has been satisfied. Other results on the overall model are presented in Table 6.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	VIF range	Durbin-Watson
1	.537	.288	.267	1.257-1.311	1.722

Source: Field Data, 2023

a. Dependent Variable: Information Technology Learning Self Efficacy
b. Predictors: (Constant), Digital Device Ownership and Digital Literacy Skills of students

The results from the model summary showed a multiple correlation coefficient of .537 (see Table 5). The results further revealed that about 27% of the variations in information technology learning self-efficacy were explained by digital device ownership and digital literacy skills of students.

Table 7 showed the results on the model fit for the regression model conducted.

Table 7: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1863.987	2	931.993	13.569	.000[b]
	Residual	4601.799	67	68.684		
	Total	6465.786	69			

Source: Field Data, 2023

a. Dependent Variable: Information Technology Learning Self Efficacy
b. Predictors: (Constant), Digital Device Ownership and Digital Literacy Skills of students

The results showed a statistically significant model, F (2, 67) =13.569, p=.000. with digital device ownership and digital literacy skills of students as predictors and information technology learning self-efficacy as a criterion variable.

Table 8 provided more information with regards to the contribution of each of the predictor variables to the criterion variable.

Table 8: Multiple Regression Analysis on the Influence of Digital Device Ownership and Digital Literacy on Information Technology Learning Self Efficacy of Students

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	18.925	5.197		3.641	.001
	Digital Ownership	.221	.180	.153	1.227	.224
	Digital Literacy Skills of Students	.712	.203	.436	3.509	.001

Source: Field Data, 2023

The multiple correlation coefficients 0.000 measure the degree of relationship between the actual values and the predicted values of information technology learning self-efficacy among students. Because the predicted values are obtained as linear combination of digital device ownership and digital literacy skills among students, the coefficient value of 0.537 indicates that the relationship between digital ownership, digital literacy skills and information technology learning self-efficacy among students is moderate but positive.

The Coefficient of Determination R-square measures the goodness-of-fit of the estimated Sample multiple Regression in terms of the proportion of the variation in the dependent variables explained by the fitted sample multiple regression equation. Thus, the value of R-square is 0.288 means that about 28.8% of the variation in information technology learning self-efficacy among students is explained by the estimated using digital ownership and digital literacy skills as the independent variables and R square value is significant at 5 percent level.

The coefficient of **B1** is .221 which represents the partial effect of teacher involvement in management of curriculum and instruction holding the other

variables as constant. The estimated positive sign implies that such effect is positive that information technology learning self-efficacy among students would increase by .221 for every unit increase in digital ownership and this coefficient value is not significant at 5% level. The coefficient of **B2** is .712 which represents the partial effect of digital literacy skills of students, holding the other variables as constant. The estimated positive sign implies that such effect is positive that information technology learning self-efficacy among students score would increase by .712 for every unit increase in digital literacy skills of students and this coefficient value is significant at 5% level.

Analyses of Hypothesis

Gender, Digital Literacy and Information Technology Learning Self-Efficacy among Students

H_1: Gender does not significantly influence digital literacy and information technology learning self-efficacy among students.

H_1: Gender significantly influences digital literacy and information technology learning self-efficacy among students.

This research hypothesis sought to find out whether there was a significant difference between gender, digital literacy skills and information technology learning self-efficacy among students. The independent sample T-test was used in the analysis. Table 9 presents the findings on gender and digital literacy skills among students.

Table 9: Gender and Digital Literacy Skills among Students

Gender	Group	N	Mean	Std. Dev.	Df	t-value	p-value
Digital Literacy Skills among Students	Male	34	31.3	3.86	68	1.514	0.135
	Female	36	29.2	7.29			

Source: Field Data, 2023 **** significant at p=0.05 (2-tailed)**

Table 9 shows the results of the independent sample t-test on male and female students in terms of their digital literacy skills at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. From Table 9, it was realized that the male students had a mean score of (*M=31.3; SD=3.86*) while the female students had a mean score of *(M=29.2; SD=7.29*). This means that the male students had more digital literacy skills as compared with their female counterparts. Again, the standard deviation (*SD=7.29*) of the female students indicates that digital literacy skills by the individual female students varied more than that of the male students (*SD=3.86*). However, when the mean scores of the two groups were tested using the independent samples t-test at 5% significant level, two-tailed, the results revealed that there was no statistically significant difference between male and female students in terms of their digital literacy skills at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis (*t(68)=1.514, p = 0.135*). Therefore, the null hypothesis which stated that, gender does not significantly influence digital literacy among students fails to be rejected.

This finding confirms that of Hew and Leong (2011) who conducted a study to find gender difference among pre-university students in Malaysia. The

study found no significant gender differences in eight out of nine ICT competencies; however, the male students were slightly higher in mean score in all the ICT competencies except word processing competency where female students had a higher mean score.

Gender and Information Technology Learning Self-Efficacy among Students

This research hypothesis sought to find out whether there was a significant difference between gender and information technology learning self-efficacy among students. The independent sample T-test was used in the analysis. Findings from the study are presented in Table 10.

Table 10: Gender and Information Technology Learning Self-Efficacy among Students

Gender	Group	N	Mean	Std. Dev.	Df	t-value	p-value
Information Technology Learning Self-Efficacy among Students	Male	34	50.1	10.30	54.349	4.574	0.000
	Female	36	40.6	6.35			

Source: Field Data, 2023 **** significant at p=0.05 (2-tailed)**

Table 10 shows the results of the independent sample t-test on male and female students in terms of their information technology learning self-efficacy at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. From Table 10, it was realized that the male students had a mean score of (*M=50.1; SD=10.30*) while the female students had a mean score of *(M=40.6; SD=6.35*). This means that the male students had more information technology learning self-efficacy as compared with their female counterparts. Again, the standard deviation (*SD=10.30*) of the male students indicates that information technology

learning self-efficacy by the individual male students varied more than that of the female students (*SD=6.35*). However, when the mean scores of the two groups were tested using the independent samples t-test at 5% significant level, two-tailed, the results revealed that there was a statistically significant difference between male and female students in terms of their information technology learning self-efficacy at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis (*t(54.349)=4.574, p = 0.000*). Therefore, the null hypothesis which stated that, gender does not significantly influence information technology learning self-efficacy among students is rejected.

This finding resonates with that of Joneset al. (2019) who conducted a survey study of 40 U.S. education institutions to learn about whether race and gender made a difference in internet usage among college students. The findings of the study suggested that, male college student Internet users spend more time online than female college student Internet users. The male college students spend greater amounts of their time pursuing a wide variety of leisure activities online including listening to and downloading music, watching and downloading videos as well as playing games than females. This finding according to Joneset al. (2019), corroborate numerous other studies that have all suggested that digital devices are boys' toys and therefore seems to favour boys than girls.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

An Overview

This chapter marks the concluding part of the study. It aims at highlighting the main findings. It also presents a summary of the research process, the conclusions, and recommendations and offers implications for future research.

Summary

The study intended to investigate digital ownership, digital literacy and information technology learning self-efficacy of junior high school students. Specifically, the study sought to explore the level of information technology learning self-efficacy among students; assess students' digital literacy skills; find out the influence of digital device ownership and digital literacy on information technology learning self-efficacy of students; and investigate whether or not there were differences in terms of gender and digital literacy and information technology learning self-efficacy among students.

The descriptive survey research design was used for the study. In all, 70 JHS 3 pupils in the Ayifua St. Mary's Anglican Basic School were sampled for the study. The simple random sampling technique was employed for the study. Questionnaire (for students) was used in collecting data for the study. The data that were gathered for the study were analyzed using both descriptive and inferential statistics such as frequency counts, percentages, means, standard deviations, multiple regression analysis and independent samples t-test. Below are the key findings from the study.

Summary of Key Findings

1. Concerning the level of information technology learning self-efficacy among students, it was realised that, the level of information technology learning self-efficacy among students was to a moderately high extent. This hinges on the findings that, to a moderately high extent, the students knew how to use computers in creating music; knew how to use Microsoft PowerPoint Presentation; knew how to use images or pictures in word processing system; and knew how to store information on a flash drive. However, to a low extent, the students: knew how to format a disk; knew how to use a scanner; and knew a little coding.
2. In relation to the ownership of digital devices among students, it was realised that, the students did not have/own most of the digital devices. With the exception of flash drives, which was the only digital device most of the students indicated that they had/owned, most of the students did not have/own the other digital devices such as: laptop computers; tablet or iPads; smartphones; E-readers; desktop computers; printers; scanners; and digital televisions.
3. On the level of students' digital literacy skills, it was realised that, to a moderately high extent, the students were competent with digital literacy skills. This is because, to a moderately high extent, the students can use digital devices to: access library resources; register for online-courses; and access information about events, student activities, and clubs/organisations. However, the students could not use the digital devices to: check grades/results; capture statistic images of in-class activities or resources; nor record their teacher's lesson or in-class activities (audio, visual, or both).

4. Regarding the influence of digital device ownership and digital literacy on information technology learning self-efficacy of students, it was realised that, the relationship between digital ownership, digital literacy skills and information technology learning self-efficacy among students was moderate but positive. Again, digital device ownership and digital literacy skills of students were statistically significant factors that influence information technology learning self-efficacy among students. However, digital device ownership did not significantly influence technology learning self-efficacy.
5. In terms gender, digital literacy and information technology learning self-efficacy among students, it was realised that, there was no statistically significant difference between male and female students in terms of their digital literacy skills. Therefore, the null hypothesis which stated that, gender does not significantly influence digital literacy among students failed to be rejected. Again, there was a statistically significant difference between male and female students in terms of their information technology learning self-efficacy. Hence, the null hypothesis which stated that, gender does not significantly influence information technology learning self-efficacy among students was rejected.

Conclusions

The following conclusions could be drawn from the findings of the study. It can be concluded that, the level of information technology learning self-efficacy among students was to a moderately high extent. However, the students did not know how to format a disk; did not know how to use a scanner; and knew a little coding. It is surprising that, although the students had learnt about coding, because it is part of the topics treated at the junior high school level,

they did not know how to code or knew very little about coding. Perhaps, the teachers did not use a practical-oriented approach in teaching ICT lessons. Also, the fact students did not know how to format a disk or how to use a scanner raises a lot of questions. Perhaps, these resources were not available for use in the schools or at home.

It can be concluded that, the students did not have/own most of the digital devices. With the exception of flash drives, which was the only digital device most of the students indicated that they had/owned, most of the students did not have/own the other digital devices such as: laptop computers; tablet or iPads; smartphones; E-readers; desktop computers; printers; scanners; and digital televisions. Taking cognizance of the fact mentioned earlier that the level of information technology learning self-efficacy among students was to a moderately high extent, it would suffice to say that the availability of these technological resources to the students would enhance their the level of information technology learning self-efficacy.

Also, it can be concluded that, to a moderately high extent, the students were competent with digital literacy skills. However, the students could not use the digital devices to: check grades/results; capture statistic images of in-class activities or resources; nor record their teacher's lesson or in-class activities (audio, visual, or both). Perhaps, teachers do not communicate or encourage the use of technology in uploading students' grades/results or recording lessons and uploading them on-line for students to learn and perform assignments while at home. It could also be that the teachers lack the expertise to do them.

Again, it can be concluded that, the relationship between digital ownership, digital literacy skills and information technology learning self-

efficacy among students was moderate but positive. Again, digital device ownership and digital literacy skills of students were statistically significant factors that influence information technology learning self-efficacy among students. Perhaps, both parents and teachers have roles to play in ensuring that the information technology learning self-efficacy among students is enhanced.

It can be concluded that, the self-efficacy of male teachers in terms of information technology learning was more as compared with their female students. Thus, there was a statistically significant difference between male and female students in terms of their information technology learning self-efficacy. Further investigations need to be carried out to ascertain why the self-efficacy of female students towards the use of information technology was low as compared to their male colleagues. However, the male students need to do more in terms of assisting the female students on digital literacy skills and improving upon their information technology learning self-efficacy.

Recommendations

Based on the findings and conclusions drawn from the study, the following recommendations have been made:

1. It is recommended that; the Government of Ghana through the Ministry of Education and the Ghana Education Service should make ICT facilities and tools available to the various basic schools so that students can familiarize themselves with their use.
2. In as much as government is being urged to provide the necessary funds to make these ICT resources available for use in schools, it is recommended that, the various schools through their PTA's should contribute to make some of these ICT resources available in their schools especially when help

is not forthcoming from government. This will make students conversant with the use of digital devices such as: laptop computers; tablet or iPads; smartphones; E-readers; desktop computers; printers; scanners; and digital televisions even if they do not own/have them at home.

3. It is recommended that, the Ministry of Education and the Ghana Education Service should provide in-service training and frequent workshops for teachers on how to use modern technology to: upload students' grades/results; capture statistic images of in-class activities or resources; and record lesson or in-class activities (audio, visual, or both) for students to learn and perform assignments while at home and get themselves acquainted with the use of these digital devices, especially for academic purposes.
4. It is recommended that the male students should assist the female students in order to improve upon their self-efficacy in terms of information technology learning and digital literacy skills.

Areas for Further Research

This study investigated digital ownership, digital literacy and information technology learning self-efficacy of junior high school students at the Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. The study could be replicated in other schools and in other regions in the country to find out what persists there. Future studies may consider further investigations in order to ascertain why the self-efficacy of female students towards the use of information technology was low as compared to their male colleagues.

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APPENDIX: QUESTIONNAIRE FOR STUDENTS

UNIVERSITY OF CAPE COAST
COLLEGE OF DISTANCE EDUCATION
DEPARTMENT OF ICT EDUCATION

Dear Respondent,

The study seeks to investigate digital device ownership, digital literacy and information technology learning self-efficacy of junior high school students at Ayifua St. Mary's Anglican Basic School in the Cape Coast Metropolis. Your full input will help make informed decisions about **the topic**. It would therefore be appreciated if you could provide responses to **all** items on the questionnaire, and do it **honestly**. You are assured of complete **confidentiality** and **anonymity** of all information provided. **Nothing** will ever be published or reported that will associate your name and/or school with your responses to the survey questions. Therefore, you **should not** write your name on any part of the instrument. Your participation in this study is **completely voluntary**. You hereby consent to voluntarily participate in this study by providing responses to items of the various sections of this instrument.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1. **Gender**:
   a) Male [ ]
   b) Female [ ]
2. **Age:**
   a) 10- 13 years [ ]
   b) 14 – 16 years [ ]
   c) 17 – 19 years [ ]
   d) 20 years and above [ ]

SECTION B: LEVEL OF INFORMATION TECHNOLOGY LEARNING SELF-EFFICACY AMONG STUDENTS

Please, indicate your view on the extent of your information technology learning self-efficacy. Your view will help the researcher to generate data on the level of information technology learning self-efficacy among students to inform practice and theory.

Direction on how to respond: Indicate your view with a tick [√]. Where: **1= Not at all; 2= To a low extent; 3= To a moderately high extent; 4= To a high extent; and 5= To a very high extent.**

Statement	**1**	**2**	**3**	**4**	**5**
3. I know how to operate a digital television.					
4. I know how to store information on a flash drive.					
5. I know how to format a disk.					
6. I know how to use word processing system.					
7. I know how to use send or receive information on a smart phone.					
8. I know how to use images or pictures in word processing system.					
9. I know how to use Spreadsheet.					
10. I know how to use a printer.					
11. I know how to use a scanner.					
12. I can code/ I know a little coding.					
13. I know how to use Microsoft PowerPoint Presentation.					
14. I know how to use computers in creating music.					

15. I can use the digital technology to surf the internet.					
16. I know how to use the digital technology to access my email.					

SECTION C: OWNERSHIP OF DIGITAL DEVICES

Please show your view on your agreement or otherwise as to whether you own any of the digital devices. Your view will help the researcher to generate data on students' digital device ownership in basic schools to inform practice.

Direction on how to respond: Indicate the following devices that you own with a tick [√]. Where: **Yes** means you own/have a particular digital device and **No** means you do not own/have a particular digital device.

Device	**Yes**	**No**
17. Laptop computers		
18. Tablet or iPad		
19. Smartphone		
20. E-reader		
21. Desktop computers		
22. Printers		
23. Scanners		
24. Flash drives		
25. Digital televisions		

Please indicate, if any……

……...

SECTION D: STUDENTS' DIGITAL LITERACY SKILLS

Please indicate by ticking to show your level of digital literacy skills. Your view will help the researcher to generate data on the digital literacy skills of students to inform practice.

Direction on how to respond: Indicate your view with a tick [√]. Where: **1= Not at all; 2= To a low extent; 3= To a moderately high extent; 4= To a high extent; and 5= To a very high extent.**

Statement: I can use digital devices to do the following…	**1**	**2**	**3**	**4**	**5**
26. access library resources.					
27. check grades/results.					
28. register for online-courses.					
29. access information about events, student activities, and clubs/organisations.					
30. read e-texts.					
31. communicate with other students about class related matters outside class.					
32. look up information while in class or outside class.					
33. capture statistic images of in-class activities or resources.					
34. record my teacher's lesson or in-class activities (audio, visual, or both).					
35. participate in interactive class activities.					

Thank You