UNIVERSITY OF CAPE COAST

SELF-EFFICACY OF TEACHERS IN INTEGRATING TECHNOLOGY IN TEACHING AT THE SENIOR HIGH SCHOOLS IN THE LA-NKWANTANANG MADINA MUNICIPALITY

STEPHEN ARHIN ASAMOAH

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BY

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Dissertation submitted to the Department of Mathematics and Science Technology of the College of Distance Education, University of Cape Coast, in partial fulfillment of the award of the Master of Education degree in Information Technology

AUGUST 2023

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: Stephen Arhin Asamoah

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. Brandford Bervell

ABSTRACT

The study examined teachers' self-efficacy in integrating technology in teaching in SHS at the La-Nkwantanang Madina Municipality. The study adopted a descriptive survey research design to assess the connection between teacher self-efficacy and technology integration in teaching. The population utilized consisted of senior high school within the La-Nkwantanang Madina Municipality in the Greater Accra Region. Purposive sampling technique was used to select respondents. Data gathered were analyzed using Statistical Package for Social Sciences. Smart-PLS structural equation modelling was adopted to estimate the relationships between the independent and dependent variables. The study uncovered that teacher self-efficacy with computers significantly influences their self-efficacies with the internet and that of the Learning Management System (LMS) whiles their self-efficacies towards the internet significantly influences their online learning self-efficacies. The study also uncovered that, teachers' self-efficacy towards LMS has a relationship with their self-efficacy towards online learning. Moreover, findings of the study revealed that teachers' self-efficacies towards learning management system, computer, internet, and online learning, significantly influence their behavioral intention towards ICT integration in education. The study therefore recommended that teachers should receive ICT training as it is essential for them to feel confident using technology in the classroom.

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My sincere gratitude goes to the God for His wisdom, love and gift of life which gives me the hope to carry out this study. Warm appreciation and credit go to my supervisor for his attention, support and direction. I say God bless you.

DEDICATION

To my wife, Miss Gloria Nyantakyi, and my dear beautiful child, Lady Akua Frimpomaa Atuahene-Asamoah.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AVE	-	Average Variance Extracted
CFA	-	Confirmatory Factor Analysis
HTMT	-	Heterotrait-Monotrait ratio
ICT	-	Information and Communication Technology
LMS	–	Learning Management System
PLS-SEM	-	Partial Least Squares Structural Equation Modelling
SHS	–	Senior High School
VIF	-	Variance Inflation Factors

CHAPTER ONE

INTRODUCTION

Background to the Study

Throughout the world, education has been recognized as an important means for promoting economic and social development both at the individual and national levels. The growth of the global economy and the information-based society has pressured education systems around the world to use technology to teach students the knowledge and skills they need (World Bank, 2004). The rapid growth in Information and Communication Technologies (ICTs) has brought remarkable changes in the twenty-first century and has affected the demands of modern societies (Crawford & Jenkins, 2017). ICT has become increasingly important in our daily lives and in our educational system. Therefore, there is a growing demand on educational institutions to use ICT to teach the skills and knowledge students need for the 21st century.

Many students in schools today can be observed walking through hallways with a cellular phone attached to headphones lodged into one or both ears while they listen to music. As a result of technology's influence on adolescents today, young people expect to be merely a mouse click or a Google search away from the information they seek. To meet students where they are, it becomes increasingly important for educators to tap into the digital world of students and engage them through one of the numerous technologies available to them (Liu, Komor, & Badran, 2017).

Using technology for instructional purposes may have widespread, positive effects on students (Shell et al., 2005). Additionally, when students

use technology in an exploratory or inquiry sense, they are actively engaged in their learning because they are interacting with their preferred medium of learning.

Teachers are considered to have a critical role in the actualization of the ideas in the integration of technology. Hence, no matter what the technology suggests, it is the teacher who makes the ultimate decisions about what is going on in the classroom (Willis, 2007). This implies that effective technology integration relies on classroom instruction, teacher competencies, and beliefs (Bergenstal, et al., 2013).

It is important to underscore that the changes teachers apply to their practices and adaptation to technology require that they have a high sense of efficacy belief (Smith, 2018). Perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to accomplish a specific teaching task in a particular context (Bandura, 1997). Self-efficacy, the belief in one's abilities to accomplish desired outcomes, powerfully affects people's behavior, motivation, and ultimately, their success or failure (Bandura, 1997). When applied to teaching, teacher efficacy is the teacher's assessment of his or her capability to organize and execute teaching and learning processes (Bandura, 2007).

Teacher self-efficacy determines the feelings, thinking, motivation, and behaviors of students (Bandura, 1997). Also, it affects how much effort will be spent and persisted by people in the face of obstacles and aversive situations. Self-efficacy beliefs are suggested to influence an individual's goals, effort, choice of activities, and persistence (Bandura, 1997). Empirical studies have shown that self-efficacy beliefs are positively associated with teachers in terms

of their commitment to teaching (Coladarci, 1992), classroom planning and organization (Allinder, 1994; Dibapile, 2012), classroom management (Poulou, 2007; Woolfolk & Hoy, 1990) and job satisfaction (Caprara, Barbaranelli, Borgogni, & Steca, 2003). Teachers' self- efficacy has also been linked to educators' willingness to implement innovative strategies of teaching (Guskey, 1988; Czerniak & Chiarelott, 1990). The researchers have shown that teacher efficacy has positive effects on teacher effectiveness.

Besides, teachers with higher levels of efficacy tend to apply management techniques to enhance student autonomy and reduce student control, and they are less critical of students when they make mistakes (Ross, 1998). Highly efficacious teachers are also more willing to support and cope with students' emotional and behavioral difficulties (Poulou & Norwich, 2002). Fullan (1994) argued in his research that when teachers have a greater sense of efficacy, it leads them to act and persist in the effort required to bring about successful curriculum implementation. Therefore, a greater sense of teacher efficacy might yield a greater degree of curriculum implementation. Teacher efficacy has been linked to the quality of instruction, use of innovative teaching methods, teacher effectiveness and appears to influence curriculum implementation and students' achievement (Wolters & Daugherty, 2007), openness to new methods in teaching (student-centered teaching strategies), positive teacher behavior (Ghaith &Yaghi, 1997), and student understanding.

In addition, teachers with a high level of efficacy provide more conducive learning environments that are planned and organized, yet flexible in meeting students' needs (Allinder, 1994; Bandura, 1997). Teachers with high teaching self-efficacy belief, spend more time on academic activities,

provide more guidance to overcome difficulties to students, and praise their academic accomplishments. Also, they are more willing to teach and maintain these teaching activities. Teachers perceive their instructional activities as successful, self-efficacy and expectations to be successful in future activities increase. Highly efficacious teachers also maintain higher levels of student engagement and are more open to experimenting with new methods (Good & Brophy, 2003; Wertheim & Leyser, 2002).

In most parts of Africa, the purpose has been to catalyse a paradigm shift towards "21st century learning" and support Education for All goals at various levels throughout the region's education system (UNESCO, 2012). However, there is no basic infrastructure to enable the use of ICT equipment even to provide basic access to digital information. In the present scenario, Africa is excluded from integration of ICT revolution except for a few financial and international business nodes that are in any case directly linked to global networks and completely by pass African economies and societies (Castells, 1999). This has led to what is generally termed in ICT as the "digital divide", a term used to denote the discrepancy between countries and people who can benefit from the progress of integrating ICT in order to develop their socio-economic structures and on the other hand those who are excluded from the process (UNESCO, 2012).

Several international agencies are now focusing their attention on the issue of the digital divide (UNESCO, 2012). African Governments, non-governmental and corporate organizations have also started initiating projects dealing with inclusion of ICT in primary and secondary education curriculum but not integrating ICT in primary teacher training curriculum. Although

countries are at the beginning of using new technology, its future use in education cannot be understood. This includes New Partnership for Africa Development (NEPAD) which focused on ICT for e-colleges as one of its projects. Adeosun (2010) observe that for many years, the focus of this investment was on making successive waves of new technology work in resource-poor education environments. This emphasis was to promote a techno-centric approach to education reform, as these emphases were viewed as layering new technology on top of social problems at the college level but not in pre-service primary teacher training colleges.

The dominant view seemed to be that ICT itself would catalyse the much-needed changes in the education system. It aims to impact ICT skills into young Africans in primary and secondary schools, and harness ICT technology to improve and expand education in African countries but not in teachers training colleges. So far computers have not transformed teaching practices. However, the lack of computers and software can seriously limit what teachers can do in classroom work with regards to integration of ICT.

In Ghana, stakeholders and policy makers in education have realised the significant gains that ICTs provide in the field of education and are taking appropriate steps to ensure that the nation as a whole reaps the full benefits of this growing force. It is in this regard that the Government of Ghana commissioned the Ghana ICT for Accelerated Development Policy (ICT4AD) in 2003 under the Anamuah-Mensah Educational Reforms in 2007. This policy sought to create the necessary enabling environment to facilitate the development of a viable knowledge-based ICT industry to facilitate the

production, manufacturing, development and distribution of ICT products and services.

Furthermore, various teacher education institutions in Ghana are increasingly paying attention to the use of ICTs in teaching and learning. The government ICT connectivity project launched in 2010 covered the then 38 Colleges of Education (COE) by providing them with computing infrastructure such as computers, printers, scanners, projectors and internet connectivity. Notwithstanding the numerous benefits that could be derived from ICT integration in schools, several factors could be outlined as constraining the realisation of such benefits in teaching. These factors are identified as teacher-level and school-level (Balanskat, Blamire & Kefalla, 2007). Al-Inany, et al., (2016) outlined the teacher-level barriers or factors as; lack of teacher confidence (efficacy), lack of teacher competence and teachers' negative attitude and resistance to change. The school related factors to combat these barriers according to Buabeng-Andoh (2012) are support, funding, training and facilities that influence teachers' adoption and integration of technologies into their classrooms. Further research has confirmed that many factors influencing teacher use of technology in a broader sense arise from the external environments where the teacher works. (Zhao & Frank, 2003).

Despite the growing reliance on technology in public life, teachers in the SHS in the municipalities are failing to integrate technology in a manner that benefits both students and teachers to its fullest potential. When teachers are using technology, often their use of this tool is not in a manner that was originally intended. For example, interactive whiteboards offer educators

many tools to involve the students. However, most teachers use interactive whiteboards as they once used their chalk boards. Many teachers admit that they are not familiar with the best practices concerning integrating technology in their classrooms. According to a study conducted by Abuhmaid (2011) knowing how to use a technology is the second most important factor in determining faculty adoption. This is an important factor concerning technology integration, however it is not the only factor.

Two other factors were also rated as important in terms of adoption: difficulty in using the technology and difficulty in learning to use technology. School systems seek an answer to this issue through the many professional development opportunities afforded educators. Despite the budget that has been devoted to both technology and training, teachers are still concerned about their ability to understand how to use the technology that is being made available to them. Shoepp (2005) introduced a study that sought to define the barriers to technology integration. In this study, he observed, "faculty or teachers in all of the studies did not feel as they were being provided with enough support to become effective technology integrators". In fact, another study found that, "… even faculty with high levels of proficiency generally identified the same barriers as faculty with low levels of proficiency". The issue remains: how can teachers better equip themselves to be more confident with the integration of technology in the classroom? Technology affords teachers and students different types of learning opportunities. Non-traditional students have seized the opportunity to return to school. In fact, a study conducted by Allen and Seaman (2010) verified that one of greatest gains in higher education trends over the last decade has been a strong growth in

distance education through online course work. Outside of the education field, many have turned to the availability of information on the internet to learn new skills or crafts. YouTube has become a great source for the do-it yourself, providing short informative how-to videos for a plethora of different situations once reserved for highly trained individuals. Pinterest is yet another social media that has experienced a pronounced growth in the previous two years.

In 2011, this social media experienced a 4000% growth. These social media provide individuals with the opportunity to learn specific skills using a brief list of directions or a video. The previous study suggests that perhaps this individualized, constructivist approach may better equip teachers for use of the technology within their classrooms. While technology enhances the learning environment, the technological advancements of the late twentieth and early twenty-first centuries have created an environment in which technology has become increasingly intertwined with curriculum and pedagogy. Today's teachers are in the midst of a pedagogical revolution: "Teachers need to be explicitly [taught] how the unique affordances of technology can be used to enrich subject domains for specific learners and … about interactions among pedagogy, content, and technology to develop their technological pedagogical content knowledge" (Clark, 2013, p. 43). Professional development is made available to teachers in an attempt to address these new concerns. Again, some communities have been very successful with regard to professional development, while others have struggled. It is essential that each community succeed in preparing teachers, as educational reform is continually placing higher demands on the teachers.

In a prior study, it was determined that many of the new expectations in education have had a large impact on both teacher and student expectations, "The central elements of systemic reform - high standards, curriculum frameworks, and new approaches to assessment aligned to those standards- generate new expectations for teachers' classroom behaviours, as well as for student performance". Despite the perceived successes or failures, technology integration is only as successful as the day-to-day use of technology. Many teachers leave professional learning for technology within the classroom feeling empowered to use the technology that they have been trained on, only to become frustrated when confronted with the daunting task of creating interactive, relevant lessons using the technology. It is essential that training be provided for educators that allows them to reach students.

However, the external factors affecting technology use, such as funding, availability and access to infrastructure, have improved, personal factors such as teachers' competence and beliefs are yet to be resolved. This calls for more studies to be conducted with particular regards to personal factors that influence ICTs usage such as self-efficacy beliefs.

In Ghana, very few studies have been conducted in support of teacher self-efficacy beliefs as one among other factors to positively or negatively influence successful ICTs integration in teaching. Available research that exists mainly focused on the external factors that influence ICTs usage such as availability, access, infrastructure and funding (Buabeng- Andoh, 2012). Personal factors such as teacher competence, attitudes and self-efficacy beliefs have not been adequately investigated. It is in respect of these significant gaps in the literature that this study seeks to investigate self-efficacy of teachers in

integrating technology in teaching in Senior High Schools especially within the La-Nkwantanang Madina municipality. Specifically, the study identifies self-efficacies towards different technologies and defines them in a model to test how they influence teachers' technology integration.

Statement of the Problem

Schools are faced with federally mandated levels of proficiency that students must attain. Failure to meet these standards could result in minimized funding, as well as the loss of accreditation. In an attempt to attain these heightened standards, educators are constantly seeking new approaches to reach students that are historically low-achieving. For the majority of teachers, this answer comes in the form of new technology. Using technology makes sense, because today's students are digital natives (Margaran, Littlejohn, &Vojt, 2011), and the majority of these students are well adept at using technology. However, technology is only as effective as the implementation of the said technology. A teacher's effective use of technology that has been made available to him or her in the classroom has a substantial impact on the effectiveness of the curriculum. Despite their growing dependence on technology, many researches still report that teachers lack the necessary confidence to integrate the available technology into their curriculum.

Schools have responded by providing teachers with additional professional development. However, "any professional development program needs to be multi-faceted to meet the needs of the very diverse population,". Previous research has established that a majority of teachers perceive the professional development they get as fragmented and without direct relevance to the challenges they encounter in the classroom. In a study conducted in

2006, Zhao and Bryant concluded that while technology integration training can be effective, it is only effective at the most basic levels, and it must be supplemented if higher technology integration is to occur. Therefore, it is imperative for schools to determine an approach that offers teachers more relevant and useful training, so that they might improve their self-efficacy with regard to the technology within their classrooms. Hence, given the fact that teachers could be considered to have a critical role in the actualization of the ideas in the curriculum, it is imperative to explore their self-efficacy beliefs in executing their functions as teachers. The problem is that teachers are struggling to integrate the technology they have available to them within the classroom (Johnson, Jacovina, Russell & Soto, 2016). Against this backdrop, the study therefore seeks to examine the various technology-related self-efficacies of teachers and the intention to integrating technology in SHS classrooms of the La-nkwantanang Madina Municipality.

Purpose of the Study

The purpose of the study was to investigate the self-efficacy of teachers in integrating of technology in the La-Nkwantanang Madina Municipality.

Objectives of the Study

The objectives of the study were to ascertain:

1. the relationship between teacher self-efficacy towards computer and teacher self-efficacy towards internet.
2. the relationship between teacher self-efficacy towards computer and teacher self-efficacy towards LMS.

3. the relationship between teacher self-efficacy towards internet and teacher self-efficacy towards online learning.
4. the relationship between teacher self-efficacy towards LMS and teacher self-efficacy towards online learning.
5. the relationship between teacher self-efficacy towards LMS and behavioral intention towards ICT integration in education.
6. the relationship between teacher self-efficacy towards computer and behavioral intention towards ICT integration in education.
7. the relationship between teacher self-efficacy towards internet and behavioral intention towards ICT integration in education.
8. the relationship between teacher self-efficacy towards online learning and behavioral intention towards ICT integration in education.

Research Hypotheses

***H_a*1:** There is a statistically significant relationship between teacher self-efficacy towards computer and teacher self-efficacy towards internet.

***H_a*2:** There is a statistically significant relationship between teacher self-efficacy towards computer and teacher self-efficacy towards LMS.

***H_a*3:** There is a statistically significant relationship between teacher self-efficacy towards internet and teacher self-efficacy towards online learning.

***H_a*4:** There is a statistically significant relationship between teacher self-efficacy towards LMS and teacher self-efficacy towards online learning.

***H_a*5:** There is a statistically significant relationship between teacher self-efficacy towards LMS and behavioral intention towards ICT integration in education.

***H_a*6:** There is a statistically significant relationship between teacher self-efficacy towards computer and behavioral intention towards ICT integration in education.

***H_a*7:** There is a statistically significant relationship between teacher self-efficacy towards internet and behavioral intention towards ICT integration in education.

***H_a*8:** There is a statistically significant relationship between teacher self-efficacy towards online learning and behavioral intention towards ICT integration in education.

Significance of the Study

This research study has the potential to contribute to existing research in relation to the self-efficacy of teachers in integrating technology in the La-nkwantanang Madina Municipality. This research is expected to benefit educators by extending the knowledge base that exists already, as it presents empirical evidence. The study will be of significance to other teachers, since many of them may also experience the same difficulties, as those encountered in the La-nkwantanang Madina Municipality.

The study would help the Ministry of Education (MoE), Ghana Education Service (GES), National council for curriculum assessment (NaCCA), to know the extent to which the various technology-related self-efficacy of teachers influence their integration of technology so that measures like teaching resources and workshops would be put in place to ensure effective integration of technology in the various SHS schools. This would help identify teacher's self-efficacy beliefs and the sources of these efficacy

beliefs so that appropriate measures would be put in place to increase teacher's self-efficacy beliefs to aid effective technology integration.

This study may help to raise awareness among policymakers, directors of education, headmasters and teachers, about teacher's self-efficacy in ICT integration that exist in SHS schools. A thorough understanding of teacher's self-efficacy in ICT integration, will inform teachers, policy makers and directors of education, in deciding how to address them, with the hope that they can be maximized entirely for the teaching and learning process. The study also verified a model that serve as a benchmark for technology integration in relation to teachers' self-efficacy beliefs.

Delimitation of the Study

This study involves only public senior high school teachers who have taught for at least one year in the La-nkwantanang Madina Municipality in 2020/ 2021 academic year. Therefore, private SHS schools are outside the scope of the study. Besides, national service personnel and attendants were not included in the study.

Limitation of the Study

It was problematic to collect information from the teachers who were the respondents of this study but did not feel comfortable to participate in the study because of fear of being stigmatized after participating.

Secondly, some respondents were unwilling to disclose information therefore making the data collection uneasy. Also, responses in teacher self-reports may be also distorted due to ego enhancement, guilt, denial, or social desirability (Ross, McDougall, & Hogaboam-Gray, 2003).

The third limitation stems from the sampling strategy which poses a threat to the external validity. Moreover, a census survey that is not based on

randomization was utilized due to the same restrictions. Also, private schools should have been included so that the researcher could get a broader picture of the subject matter. As such, the generalizability of the findings is limited to public schools.

Finally, the design and nature of this quantitative study provide a snapshot of teachers' beliefs at a particular time, without consideration of factors that may influence these beliefs.

Organization of the Study

The study is presented in five chapters. Chapter One introduces the study by setting the background, identifying the main issue to be investigated (statement of the problem), the purpose of the study, and formulates research questions that provide a guide for the study. It also outlines the significance of the study, the delimitation (scope) and limitation of the study, and the organization of the study. Chapter two centered on the literature review. The review covers the theoretical, conceptual as well as empirical framework of the study. Chapter three deals with the methods which were adopted in the study. Topics covered include research design, population, sample and sampling procedures, instrumentation, as well as data collection and data analysis procedures. Chapter four then captured the discussion of the results and findings of the study. The findings from the study were presented and discussed in relation to the research questions and hypotheses that guided the study. Chapter five provides a summary of the research findings and conclusions; and makes recommendations on how they influence educational theory and practice as well as future studies.

CHAPTER TWO

LITERATURE REVIEW

Overview

The study's second chapter reviews relevant literature and offers a summary and evaluation in connection to the research problem. The notion of technology self-efficacy toward computers, the internet, learning management systems, and online learning will be examined in relation to teachers' technology integration into teaching.

Self-Efficacy

A person's self is his or her unique identity, and efficacy is the capacity to have an impact. Combining these suggests a conscious understanding of one's ability to operate effectively and in control (Zulkosky, 2018).

Self-efficacy is the capacity to perform given circumstances using one's skills (Kent, 2017). To put it another way, it refers to a person's confidence in his or her capacity to coordinate and orchestrate skills and abilities in dynamic, demanding settings (Sahoo, 2021). It is connected with one's self-confidence. Self-efficacy, according to Ahmed, Qazi, and Jabeen (2011), depicts a person's self-confidence in their ability to take some certain creative endeavors or fully utilize their abilities and, as a result, achieve specific results. Efficacy controls the disposition to execute some initiating actions, the determination to go through difficult situations and the energy to complete the duties you've been given (Bandura, 1997). It is the belief that an individual has the necessary talent to deliver desired results. Someone may be self-confident at one time but not at another since self-efficacy is condition-based, although they are interconnected (Bandura, 1997).

Self-efficacy is viewed as the self-accomplishment engine (Zulkosky, 2018). However, unfavorable assessments of a teacher's abilities in the classroom can lower student confidence in their own abilities. Studies show that self-reliant teachers who are completely confident in their abilities can handle challenging situations and prefer to learn from their own experiences (Ahmed, Qazi, & Jabeen, 2011). Four knowledge bases provide the essential foundation of self-efficacy. They are the insights gained by reading or listening to someone else, the skills acquired from working side by side, communicating in a way that compels others to listen and respond, and the physical condition. According to research, earlier performance activities result in the development of self-efficacy (Bandura, 1997). Three characteristics of self-efficacy, including cognitive processes, affective processes, and locus of control, were listed by Bandura (1997).

Cognitive Process: In the cognitive process, anticipation of goals that are considered as important controls human behavior. However, one's opinion of one's own ability has an impact on personal goal-setting. People who have high levels of self-efficacy are more likely to set challenging objectives, take on more difficult challenges, and exert all of their effort to achieve those goals (Schunk & DiBenedetto, 2021).

Affective processes: Within these characteristics, an individual's self-assurance in their skills impacts how much stress and anguish they feel in daunting situations as well as their level of motivation. Depending on how well people believe they can cope, emotional responses can affect behavior both directly and indirectly by altering the mental process (DeSteno, Gross &

Kubzansky, 2013). Threats have less of an impact on people who believe they can handle them.

Locus of Control: This phrase refers to a person's perception of the underlying factors that led to occurrences in his or her life. People think that either external forces, like fate or luck, or internal forces, like a person's choices or efforts, determine one's destiny (Anderson, Turner, Heath & Payne, 2016).

Technology

The method through which individuals attempt to improve and change the world is referred to as technology. Technology is defined as the process of using information, skills, and resources to achieve specific results, solve specific issues, and complete specific activities. Technology refers to the theoretical and applied knowledge, abilities, tools, and artifacts that can be utilized to create goods and services as well as the manufacturing and delivery processes for those goods and services. Application of knowledge to the practical goals of human life or to modifying and managing the environment of humans is carefully thought out (Barak, 2005). It encompasses the utilization of resources, equipment, tools, and methods to improve productivity at work and make life easier or more enjoyable. The internet, computers, and learning and management systems are all included. According to Anton, Earp and Young (2010), technology encompasses knowledge and procedures utilized in the design, manufacture, and usage of items such as computers, software, aircraft, and microwaves. Additionally, people, materials, cognitive and physical processes, infrastructure, equipment, and tools are all forms of technology (Lin, 2003). Technology and knowledge are

interdependent, according to Bozeman (2000), simply because when a technological product is transferred or distributed, the information on which it is founded is likewise diffused.

Technology Self-Efficacy

Technology self-efficacy is concerned with a teacher's perceived capacity to integrate digital tools, such as software applications and web 2.0 technologies, into teachings in the classroom and across the curriculum. Regarding both task-specific and task-dependent technology use, it is concerned with a person's level of confidence (Artino, 2012). A teacher's confidence in integrating technology is critically influenced by self-efficacy (Forgeard, Silverman, Buchholz, Beard, & Bjorgvinsson, 2021). As Bandura proposed, having a strong belief in one's own abilities is essential for accessing knowledge and skills while maintaining task-focused attention.

Self-Efficacy towards Computers

Computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (Input), process the data according to specified rules, produce information(output) and store the information for future use. It consists mainly of four units; namely input unit, storage unit, central processing unit and output unit. Today computers are used for communication, management, research and drawing in education and other sectors of the economy (Ridzuan, Sam, & Ahmad, 2012). However, the ability to succeed and make new innovations in education easier to access lies in a teacher's optimistic attitude (Rama, Malik & O.F, 2015).

The formation of a good attitude toward computers, however, is currently a crucial topic in education (Birisci, Metin & Karakas, 2009). The

majority of educational institutions have fought to include proper computer technology to improve instruction, despite its rising acceptability in the social order (Mugivane, 2014). Although there are more computers available in classrooms, they are still rarely used. According to research, teachers who initially exhibited a range of attitudes such as apprehension about potential failure due to a lack of technological knowledge gradually grew to appreciate it via their interactions with students.

According to Gos (1996), teachers' confidence in using computers in the classroom have an impact on their desire to use computers and work together to integrate computer resources into lesson plans. According to Woodrow (1992), female instructors' lesser computer confidence prevents them from using computers in the classroom when teaching mathematics. However, it has been discovered that male teachers are more internal in their locus of control and more dedicated to the actual usage of computers in the classroom.

According to a study by Gos (1996), female teachers' lack of computer knowledge is a factor in their low confidence toward computer integration. Age does affect instructors' self-efficacy about computers, according to other studies on this topic (Bozeman, 2000). Koszalka argued in 2001 that both teachers who educate young students, both male and female, are more comfortable using computers. In comparison to their Singaporean counterparts, Malaysian teachers, according to a study, had a more confidence toward using computers in the teaching-learning process in the classroom (Ridzuan, Sam & Ahmad). The growth of teachers' confidence toward computer usage, according to Albirini (2006), is a crucial element not only for

boosting computer integration but also for preventing teachers' opposition to computer use.

Self-Efficacy towards Internet

The internet has become a source of communication for individuals all around the world as network technology changes quickly every day (Ercan & Tekerek, 2012). The term "Internet" refers to a global computer network that uses established communication protocols to connect interconnected networks and provide a variety of data and communication services (Fleisch, 2010). One of the new social practices that brings about changes in terms of the ease of communication and other areas is internet use. The widespread usage of the internet, however, raises the possibility that it can also be used more extensively for educational purposes. Internet-based education teaching methods have proliferated in today's society.

According to Liang (2007), regardless of how cutting-edge a technology is, its success depends on users' confidence concerning it. Teachers can ensure that pupils make greater use of the internet for learning and teaching. That is why it matters how instructors feel about the internet. Teachers serve as examples for both pupils and society at large. Information literacy among teachers is directly tied to efforts to use the internet more successfully in the classroom. According to Ercan and Tekerek (2012), female instructors utilize the internet more frequently than male teachers, but they do it with a more confidence. The study also showed that teachers with experience working in the field have more confidence toward using the internet for social contact than do those without experience. Internet-based applications are crucial agents and assistants for creative education and

efficient management in preschools, according to early childhood educators (Gos, 1996).

Instructors have confidence in using the internet in the early childhood classroom. Their awareness of and exposure to the benefits of internet use in schools has a beneficial impact on their confidence toward accepting the internet (Turel & Johnson, 2012). For preschool performance and instructional effectiveness, a teacher definitely demonstrates greater preference for internet applications when they have a higher level of positive attitude toward their own digital self-efficacy (Teo & Noyes, 2011). Wong, Teo and Russo (2013) found a direct correlation between teachers' attitudes toward the internet and their preferences for and confidence related to embracing technology. However, teachers' confidence in using internet tools do influence their plans to use the internet for instruction (Gurcay, Wong & Chai, 2013).

According to research by Davis (1989), teachers' behavioral usage of the internet may be influenced by their perception of its value. The usage of internet-related tools and applications by instructors to encourage social engagement and sharing behaviors is positively impacted by their acceptance of the medium, application preferences, and ability to see practical benefits (Gu, Chen, Zhu, Jiang, Wang, Chen & Jiang, 2014). Bahcekapili (2012) offers a greater knowledge of how behavior intention to use the internet is affected by perceptions of its utility, usability, and preschool teachers' opinions regarding its use.

Self-Efficacy towards Learning Management System (LMS)

Learning Management System (LMS) is a software program that provides a number of integrated tools for providing and administering online

teaching. Digitalizing books and lecture notes is what it mostly entails (Aydin & Tirkes, 2010). By utilizing the proper educational method, it enables users to spread information from systematic planning. With the use of an LMS, a teacher can design online courses, oversee their administration, and foster student participation while also fostering students' capacity for critical thought (Lex & Hauber, 2010). Using Moodle for group discussions and video conferencing are two examples. It serves as a platform for students to complete tasks swiftly, allowing users to access material at any time and from any location, as well as to share knowledge and work together online with other students in the classroom (Gudanescu, 2012).

LMS improves self-regulated learning by reducing the amount of time that lecturers and students must spend on administration and by making learning materials easier to access (Gudanescu, 2012). According to Al-Saeed (2014), a user's self-efficacy toward a learning management system (LMS) has a significant role in determining whether they really use the system or disregard it.

According to the study, perceptions of the system's usefulness and usability have been shown to have a significant impact on self-efficacy about learning management systems. Teachers and students have good opinions toward adopting learning management systems in teaching and learning, according to a study by Alshorman (2018). According to Abdulrahman Bin, teachers who have confidence toward learning management systems (LMS) encourage students to use them by posting instructional materials there and fostering classroom discussion.

According to Aljarah (2011), the use of learning management systems in the classroom is viewed favorably by study subjects due to the fact that it encourages active involvement and good academic accomplishment among students. According to the report, using a learning management system helps teachers and gives interested students access to online learning options. Due of their time demands and additional responsibilities in the home, female teachers typically have negative opinions regarding learning management systems.

According to Alshamary (2016), the number of years of experience and academic path do not significantly differ in how teachers feel about using a learning management system. But regardless of this, the majority of teachers are attempting to integrate the LMS into their instruction. Regardless of their academic background or years of experience, all teachers use a management system. But according to a different study by Alshorman and Bawaneh (2018), there are no statistically significant changes in students' views toward using the learning management system based on gender. This is so that all pupils, regardless of gender, can learn through programs. Despite the alleged advantages of using LMS, many instructors are still reluctant to use those (Zanjani et al., 2016). Furthermore, despite widespread availability of LMS in higher education settings, teachers frequently underuse it (Bousbahi & Alrazgan, 2015). The view of teachers, their ideas about their own efficacy, and their instructional goals, as well as the availability of resources and support, are all factors that influence the adoption of learning management systems (Siyam, 2019).

Self-Efficacy towards Online Learning

Internet-based education is referred to as online learning. The most common name for it is "E-learning" (Zhu, Au, & Yates, 2013). It uses a range of technologies, including computer networks and the global web, email, chat, audio, and video conferencing (Sakshi & Dhull, 2017). In spite of this, it is now the most well-liked and recent method of online education. The flexibility of online education allows for self-paced and convenient study. It calls for a significant investment of time and money. Rather than transmitting content information, teachers facilitate learning in online environments (Mehra, 2007).

One important element of the learning environment is the confidence about online learning. The way people feel about online education is influenced by their self-efficacy (McCarthy, 2010). Studies have shown, however, that students' earlier ICT usage experiences may have an impact on their confidence toward online learning (MacDonald, Vanduinkerken, & Stephens, 2008). According to a study by Lee, March, and Peters (2015), schools that provide online courses have a more favorable perception of the value of online education than their peers who do not. In order to find relevant information for their research, faculty and students primarily use e-learning sites (Mutisya & Makokha, 2016). Universities all across the world are rapidly embracing e-learning due to its benefits (Allen & Seamen, 2008).

According to Walimbwa's (2010) observations, despite e-learning's global growth, certain colleges have not yet completely realized its promise. This is because there aren't enough people with the right abilities. One barrier preventing the adoption of e-learning in schools is the level of confidence toward technology (Nyerere et al.,2012). On the other hand, a study by Abdi,

Waititu, and Mugo (2021) revealed that while utilizing the online learning system, pupils are more confident, although teachers occasionally lacked the necessary expertise. According to the study's findings, online learning had become more enjoyable for both professors and students. In online learning, both professors and students are enthusiastic about the process. The survey also showed that teachers preferred to use online learning since it gives them the opportunity to conduct research before instructing in the classroom.

Behavioral Intention towards ICT Integration in Education

ICT integration in education typically refers to a technologically-based teaching and learning process that is strongly related to the use of learning tools in classrooms (Ghavifekr, 2015). The daily classroom educational process includes the use of computer-based communication (Edvard & Christian Arnseth, 2012). To meet the challenges of the current globalization, it is advantageous for learning communities to network. Its goal is to increase student learning outcomes by raising the level of instruction's quality, accessibility, and cost-effectiveness (Chapelle, 2011). Technology-based learning environments benefit students who are accustomed to it. Integrating ICT into the classroom in particular in schools is a crucial problem.

Technology in education has a significant contribution to the pedagogical aspects, where the usage of ICT will result in successful learning with the aid and assistance of ICT elements and component (Jamieson-Proctor, et al., 2013). ICT integration in education is essential because it allows for the possibility of learning and teaching to take place not just in a traditional classroom setting but also when teachers and students are separated geographically. But ICT integration is not a one-time learning process; rather,

it is a continuous learning process that creates an active teaching-learning environment (Young, 2003). The use of ICT in the classroom aids teachers in developing engaging, creative, and successful lesson plans that encourage student participation. Although it maximizes the student's capacity for active learning and improves the learning process (Jamieson-Procter et al, 2013).

The intention to act in a certain way or to carry out a certain activity is expressed or measured by behavioral intention (Rudhumbu, 2020). According to OECD research published in 2019, about half of secondary teachers believe they are ready to use ICT in the classroom. However, just 59% of teachers allow ICT use in the classroom. According to Wong, Teo, and Russo's (2012) research, those who believe they will find using ICT easy generate behavioral intentions to adopt and utilize it. Teachers who think utilizing ICT for instruction will make performing their duties easier and more productive create behavior intentions to adopt.

Perrotta (2013) discovered that teachers can carry out a variety of tasks with the help of ICT, including gathering information and creating lesson plans, corresponding with students and parents, and disseminating resources to the larger education community. Anni et al. (2018) also found that teachers who evaluated ICT as being useful to the performance of their task tended to generate behavioral intentions to adopt it. The purpose of teaching staff's professional development in ICT is to give them the skills necessary to carry out their responsibilities with ICT in an efficient manner. To enable and support teachers in using ICT in the classroom, ICT professional development is essential. The adoption of efficient and significant teacher professional

development of teachers' innovative pedagogies and digital fluency is a crucial component.

According to studies by Abuhmaid (2011), Buckenmeyer (2010), and Welch (2012), allowing teachers to advance their ICT knowledge and abilities through professional assistance changes their attitudes toward ICT and encourages their behavioral intents to use ICT in the classroom. Teacher professional development in ICT aids in the development of specific ICT knowledge and abilities that support the behavioral intentions of teachers to utilize ICT for teaching. Providing teachers with ICT professional development increases their behavioral intentions to use technology for instruction.

According to Baker (2014), professional development improves intentions to embrace IT by lowering ICT anxiety and boosting confidence in users. In a study, Schoonenboom (2014) discovered that teachers' acquired competencies, skills, and capacities strongly influence their behavioral intents to use ICT. Again, having a sufficient infrastructure for ICT assistance encourages teachers to use it in their lessons. The effective adoption and use of ICT depends on teams, systems, and support personnel who can encourage and maintain teachers' behavioral intents to adopt and utilize ICT in the classroom. Rudhumbu (2020). A supportive institutional environment with enough ICT systems maintenance and update tools, adequately qualified support workers, and a supportive leadership is a vehicle for encouraging teachers' behavioral intentions to use ICT in schools.

Theoretical Review

Social Cognitive Theory

Perkmen and Pamuk (2011) described the social cognitive theory as individuals' beliefs about their capacities to achieve predetermined levels of performance that exercise control over circumstances that have an impact on their lives. Therefore, self-efficacy beliefs not only influence but also control how people feel, think, motivate themselves, and conduct. People lack motivation to change their behavior or maintain it once their goals have been met unless they believe they can attain desired results through their activities. Teachers must therefore have a strong sense of task-specific self-efficacy and resilience in order to overcome the inevitable challenges that come with integrating technology in the classroom (Ali Gamal El-deen, 2020). Although teachers' self-efficacy beliefs do not always transfer into actual technology use, they are a necessary precondition for technology integration (Wang et al. 2004).

High self-efficacy in one area may not necessarily translate into high self-efficacy in another, according to Artino (2012), because people may think that other circumstances will prevent them from achieving in that area. Simply put, self-efficacy measures how strongly people feel they possess the abilities necessary to succeed in relation to the particular activity at hand (Artino, 2012). Self-efficacy is concerned with a teacher's perception of their capacity to use appropriate digital technologies to include them into lessons and support effective education utilizing those resources in the classroom. The ability of teachers to make technological and pedagogical judgments about how, why, and when to use technological tools to improve teaching and

student learning has an impact on the success of technology integration in the classroom.

Conceptual Framework

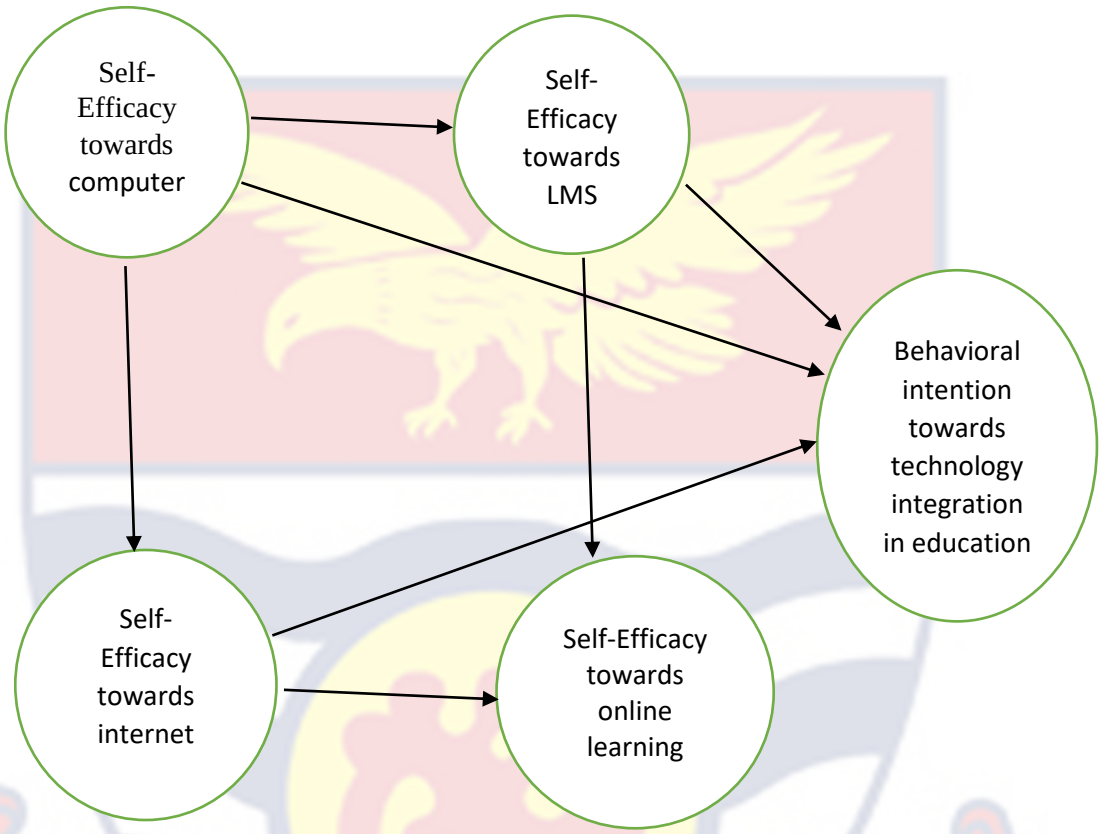

Figure 1: Conceptual Framework

The conceptual framework as depicted by figure 1 would suggest that teacher self-efficacy towards computer, internet, LMS and online learning may have positive relationships with behavioral intention towards ICT integration in education. For example, teachers who have high levels of self-efficacy towards computer, internet, LMS and online learning may be more likely to have a positive behavioral intention towards ICT integration in education. The framework would also suggest that there may be relationships between teacher self-efficacy towards computer and internet, and between teacher self-efficacy towards LMS and online learning. For example, teachers who have high levels of self-efficacy towards computer may also have high

levels of self-efficacy towards internet, and teachers who have high levels of self-efficacy towards LMS may also have high levels of self-efficacy towards online learning. Moreover, figure 1 suggests that teacher self-efficacy towards computer, internet, LMS and online learning may have positive relationships with each other. For example, teachers who have high levels of self-efficacy towards computer may also have high levels of self-efficacy towards internet, LMS and online learning.

Finally, the framework would suggest that teacher self-efficacy towards computer, internet, LMS and online learning, and behavioral intention towards ICT integration in education may be influenced by external factors such as school policies, support from colleagues and administrators, and access to technology resources. Overall, the conceptual framework provides a useful structure for understanding the complex relationships between teacher self-efficacy towards computer, internet, LMS and online learning, and their behavioral intention towards ICT integration in education. The framework can guide the selection of variables to be measured and analyzed in the study, as well as inform the development of interventions to promote effective ICT integration in education.

Empirical Evidence

Numerous researches on teachers' self-efficacy in utilizing technology in the classroom have been done. For instance, Kent (2017) research on the self-efficacy of preservice teachers at a doctoral university in the United States in integrating technology indicated an increase in teachers' self-efficacy in doing so. The study used quantitative, descriptive statistics to assess pre-service teachers' perceptions of their own self-efficacy in relation to a number of particular areas of technology integration.

Another study by Bakar Abu, Maat, and Roslinda (2020) on the self-efficacy of technology integration and knowledge of technological pedagogical content in mathematics teachers revealed that gender and teaching experience have no effect on a teacher's self-efficacy of technology, but that a teacher who has positive self-efficacy and knowledge can integrate technology.

Another study by Sahoo and Panda (2021) on the technological self-efficacy of secondary school teachers in India found that while most instructors used lesson planning software, they hardly ever used it to create additional teaching materials. However, relatively few teachers really use social media in the classroom.

In addition, a study by Njiku et al. (2020) found a substantial correlation between technology use and self-efficacy in integrating technology, despite teachers expressing a modest degree of self-efficacy. The study also found that a relatively small number of teachers reported using technology for educational purposes. A survey design was used for the investigation. A variety of elements, such as personal, behavioral, and environmental ones, contribute to the growth of teachers' technology self-efficacy in the context of classroom technology integration.

Chapter Summary

The literature review of this particular study highlighted the concepts of self-efficacy, technology, technology self-efficacy, self-efficacy towards computers, learning management systems, and presented a theoretical review. However, it also covered the conceptual framework, empirical evidence, and concluded with the summary of the chapter.

CHAPTER THREE

RESEARCH METHODS

Overview

This chapter explains the process and methods the researcher used to carry out the study. It considers the research design, research population, study area, sampling method, sampling technique, data collection methods, and mode of data analysis.

Research Design

To answer the research hypotheses, the study adopted a correlational survey research design, specifically a quantitative research strategy. This is due to the fact that it provides a correlation between all of the research's variables as they stand right now. The design was also chosen because it looked ideal for assisting the researcher in gathering the information required to address the study's purpose. Because statistical values were used to examine the research objectives, a quantitative research approach was used in the study (Omona, 2013). A questionnaire with both open-ended and closed-ended questions was used to conduct the study to determine how effective teachers believe they are at incorporating technology. The questionnaire, or survey instrument, was created by taking parts and pieces from earlier investigations. The appendix contains the survey instrument developed.

Study Area

The study area has to do with the area of interest specifically the zone that is important to the researcher and has the potentials in achieving the research objectives (Kothari, 2004). La-Nkwantanang Madina Municipality is one of twenty-nine districts in the Greater Accra region. It is located in the

Western part of Greater Accra region and has Madina as its capital town. The Municipal has only two Senior High Schools namely Presbyterian Senior High School and St. Peters Senior High School. The study area was selected because it has not been covered in literature as to how self-efficacy of teachers affect their intention to integrating technology in teaching.

Study Population

Teachers from SHS in the La-Nkwantanang Madina Municipality make up the study population. There are 256 number of teachers in the municipality.

Sample and Sampling Technique

Simple random technique was applied to select a sample size of 60 respondents consisting of the teachers from 6 selected departments of two Senior High Schools in the La Nkwanteng Madina Municipal thus, Presbyterian Senior High School and St. Peters Senior High. The total number of teachers in each department surveyed was five. The researcher randomly selected five teachers from the General Science Department, five from General Arts Department, five from Business Department, five from Visual Arts Department, five from Home Economics Department and five from Agricultural Department. In all, a total of sixty (60) respondents comprising of exclusively teachers were indiscriminately nominated to partake in the study. Simple random sampling method was chosen to give respondents equal opportunity to be selected and also get satisfactory and appropriate information on the study being conducted.

Data Collection Instrument

The study used self-administered survey instrument thus questionnaires for data collection. The questionnaire was created and restructured with close-ended questions. Part A consisted of demographic characteristics of respondents which accounted for the gender, age, department, and years of service of respondents. Part B is made up of Section A to E which seeks to answer the various objectives. Section A consist of questions on teacher self-efficacy towards computers. Sections B consist of questions on teacher self-efficacy towards internet, Section C consist of questions on teacher self-efficacy towards LMS. Section D consist of questions on teacher's self-efficacy on online learning and Part E consists of questions on behavioral intention of teachers towards ICT integration in education.

Validity and Reliability

In order to ensure that the data collection is valid and reliable, the tool was pretested and given to the project supervisor to check for correction and validation. The survey instrument was pre-tested to ensure that ideas were valid and reliable. Aside my academic supervisor, 5 teachers from the selected schools who were not tangled in the inquiry was requested to complete the survey and a criticism form about the survey. The form demanded from teachers whether they found any queries confusing, forceful, movement of questions was reasonable, and the order of enquiries made common sense. Comments made by the academic supervisor and the 5 teachers were evaluated and changes were made where appropriate. Pre-testing established that teachers were flawless about the concept used, showing that the survey

items had face validity. Also, the questions matched the objectives of the study and were consistent with the questionnaire.

Data Collection Procedure

In carrying out research of this nature, two sources of data are mostly employed; primary data and secondary data. The primary data is the immediate data or data gathered from the field which include questionnaire whereas the secondary data is data already gathered by someone which includes publications, journal articles, books etc. (Saunders, Lewis, & Thornhill, 2007). The survey instrument aided the researcher in gathering primary data from respondents who consisted solely of teachers. An introductory letter clarifying the research and introducing the researcher was sent to Senior High Schools within La-Nkwanteng Madina Municipality. A follow up was done after a week with personal visit to the school and afterwards, the researcher arranged with key contacts at each department to inspire teachers to complete survey instrument and return them. Three (3) weeks was utilized for the data collection. This was done to get the data relevant to carry out the research.

Data Processing and Analysis

In analyzing the survey data, a code book was set, and all of the surveys were entered in Statistical Package for Social Sciences (SPSS) version 25.0. According to Tabachnick and Fidell (2007), it is very crucial to screen data before analysis. The data were analyzed using SPSS version 25.0 software. Each question on the questionnaire was parted and evaluated individually. In addition, percentages were used to present some the results of the findings as well. However, the researcher adopted the partial least square

structural equation modelling for estimating the relationship among the independent variables and the dependent variable.

Ethical Consideration

A study that encompasses people as participants especially need to be carried out in an ethical manner to defend the rights of people. The three moral ideas of beneficence recognize for human dignity and justice were considered (Polit & Beck, 2004). This study was carried out with ethical clearance being sought and obtained from each department at the school. Each respondent was informed concerning the objectives of the study and assured of confidentiality concerning any information obtained from them. Participation of the study respondents were obeyed to the required ethical guidelines for the use of human subjects.

Chapter Summary

This section highlighted on the process and methods the researcher used to carry out the study. It considered the research design, research population, study area, sampling method, sampling technique, data collection methods, mode of data analysis and concludes with the summary of the chapter.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

The purpose of this chapter is to present the results of the study. The research questions are investigated, and findings provided; in order to address the research objectives. The first section which is the preliminary section addresses the summary of the research respondents (demographic analysis). The second section deals with the results focused on the eight-hypothesis guiding the study. The hypotheses were tested with the use of partial least square structural equation modelling. The initial assessment of the Partial Least Square Structural Equation algorithm was done with exploratory factor analysis followed by confirmatory factor analysis (CFA) which consist of the Cronbach's Alpha, rho. A composite reliability and average variance extracted. The structural model analysis comprised paths significance, f-squared, confidence interval and total variance explained by the mode. The third and final section of this chapter focuses on the discussion of results.

Demographic Characteristics of Respondents

The demographic characteristics of the study take in the gender, age, department and years of service.

Table 1: Demographic Characteristics of Respondents

Variable	Categories	Frequency	Percentage (%)
Gender	Male	39	65.0
	Female	21	35.0
	Total	**60**	**100**
Age Group	18-25	5	8.3
	26-35	16	26.7
	36-45	26	43.3
	46-55	10	16
	56 and above	3	5.0
	Total	**60**	**100**
Years of Service	1-4years	17	28.3
	5-8years	29	48.3
	9years and above	14	23.3
	Total	**60**	**100**
Department	General Science	10	16.7
	General Arts	10	16.7
	Business	10	16.7
	Visual Arts	10	16.7
	Home Economics	10	16.7
	Agriculture	10	16.7
	Total	**60**	**100**

Source**:** Field Survey, (2023)

As shown in Table 1, out of a total of 60 respondents who were selected to participate in the study, 39 representing 65% of the respondents were males whiles 21 representing 35% of the respondents were females. Majority (26) of the respondents were ages of 36-45 representing 43.3%. 16(26.7%) were ages of 26-35 whiles 10(16.7%) were ages of 46-55. 5 representing 8.3 were ages of18-25. 3 representing 5% were 56 and above.

The significant number 29(48.3%) of the respondents who participated in the study had been in service for 5-8 years followed by 1-4 years also recording 28.3%. More so, 14(23.3%) had been in service for 9 years and above. However, out of a total 60 respondents who participated in the study 9(16.1%) were from the General science department, 10(17.9%) were from the General Arts department, 10 representing 17.9% were from the Business

From Figure 2, only one item (TSETC2) loaded below the minimum 0.5 threshold and was therefore deleted as recommended by Hair et al. (2017). After the deletion, a confirmatory factor analysis based on PLS-Algorithm was run to verify all the factor loadings. The result is depicted by Figure 2.

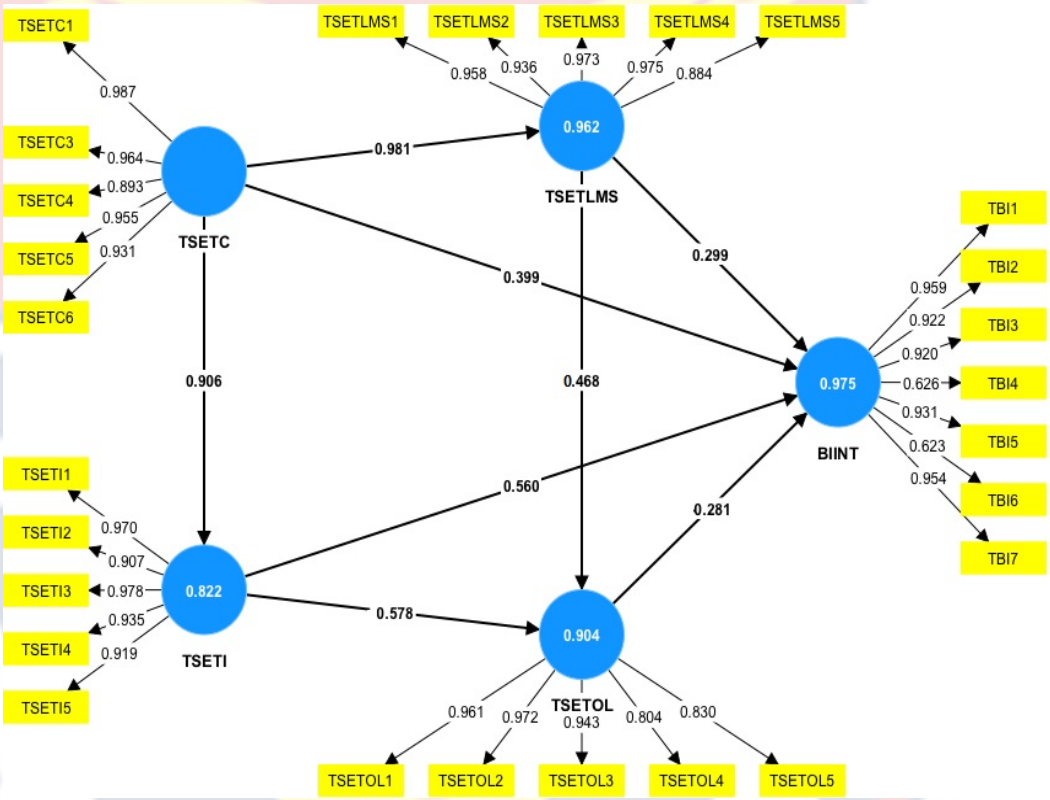

Figure 3: PLS Algorithm for confirmatory factor analysis (CFA)

From Figure 3, all the items measuring the various constructs as used in the questionnaire loaded sufficiently. Thus, six items were used to measure teacher self-efficacy towards the computer, five items were used to measure teacher self-efficacy towards the internet, teacher self-efficacy towards online learning, teacher self-efficacy towards learning management system and seven items used to measure teacher behavioral intention. Meanwhile, all items loaded achieved the minimum loading of approximately 0.6 suggested by Hair et al. (2017). The result presented in Figure 2 show that all items reflecting

each of the variables of the study obtained the minimum 0.60 approximation and above as suggested by Hair et al. (2017).

Internal Consistency Measures for the Analysis

Results for the internal consistency of the PLS model using four indicators thus Cronbach's alpha, rho A, composite reliability and average variance extracted (AVE) are presented in Table 2.

Table 2: Reliability and Validity

Variable Items	Outer loadings	Cronbach's Alpha	Composite Reliability (rho_a)	Average Variance Extracted
TBI1 <- BIINT	0.959	0.937	0.957	0.739
TBI2	0.922			
TBI3	0.920			
TBI4	0.626			
TBI5	0.931			
TBI6	0.623			
TBI7	0.954			
TSETC1 <- TSETC	0.987	0.971	0.976	0.896
TSETC3	0.964			
TSETC4	0.893			
TSETC5	0.955			
TSETC6	0.931			
TSETI1 <- TSETI	0.970	0.968	0.972	0.888
TSETI2	0.907			
TSETI3	0.978			
TSETI4	0.935			
TSETI5	0.919			
TSETLMS1 <- TSETLMS	0.958	0.970	0.973	0.894
TSETLMS2	0.936			
TSETLMS3	0.973			
TSETLMS4	0.975			
TSETLMS5	0.884			
TSETOL1 <- TSETOL	0.961	0.943	0.948	0.819
TSETOL2	0.972			
TSETOL3	0.943			
TSETOL4	0.804			
TSETOL5	0.830			

The reliability and validity results of the model as presented in the model indicate that AVE values for all variables ranged from 0.739 to 0.819 which is above the minimum threshold of 0.50. Values obtained for the composite reliability (Rho_A) for all construct were between 0.948 to 0.976. For Cronbach's alpha, values obtained also ranged between 0.937 to 0.971. However, all values obtained for the variables were above the minimum threshold of 0.700 under the superior indicators such as composite reliability and AVE as recommended by Hair et al. (2017). Thus, all variables of the model achieved both reliability and validity standards.

Discriminant Validity

Heterotrait-Monotrait ratio (HTMT) was used to check the uniqueness of each variable in the study for the discriminate validity as suggested by Henseler et. al (2015). Table 3 presents the results indicating that all diagonal loadings for the same variable were zero and between variables of study were below 0.9 threshold indicating that the constructs did not overlap, and they are unlikely measuring the same thing. In light of that, discriminant validity between the constructs was obtained.

Table 3: Heterotrait-Monotrait Ratio (HTMT)

Variables	BIINT	TSETC	TSETI	TSETLMS	TSETOL
BIINT	**0**				
TSETC	0.892	**0**			
TSETI	0.814	0.822	**0**		
TSETLMS	0.812	0.818	0.862	**0**	
TSETOL	0.899	0.890	0.808	0.861	**0**

Multicollinearity

The study examined the existence of multicollinearity, using the variance inflated factors (VIF) as suggested by Hair et al. (2017). Multicollinearity check carried for the construct using Variance Inflated Factor (VIF) produced results as shown in Table 4. The threshold by Hair et al. (2017) posited that VIF values should be below 3.3 suggesting that the reflective model was multicollinearity free.

Table 4: Variance Inflation Factors

Variables	BIINT	TSETC	TSETI	TSETLMS	TSETOL
BIINT					
TSETC	3.006		1.000	1.000	
TSETI	3.160				2.055
TSETLMS	2.909				2.754
TSETOL	3.254				

Table 4 thus shows the results for the multicollinearity analysis. It was clear from the results shown in Table 4 that there was no presence of multicollinearity since all the inner values were below 3.3 threshold.

Structural Model and Hypotheses Testing

The study tested significance of the hypothesized paths. Figure 4 presents the results for the bootstrapping sequence of 5,000 samples utilized in the PLS bootstrap procedure as recommended by Hair et al. (2017).

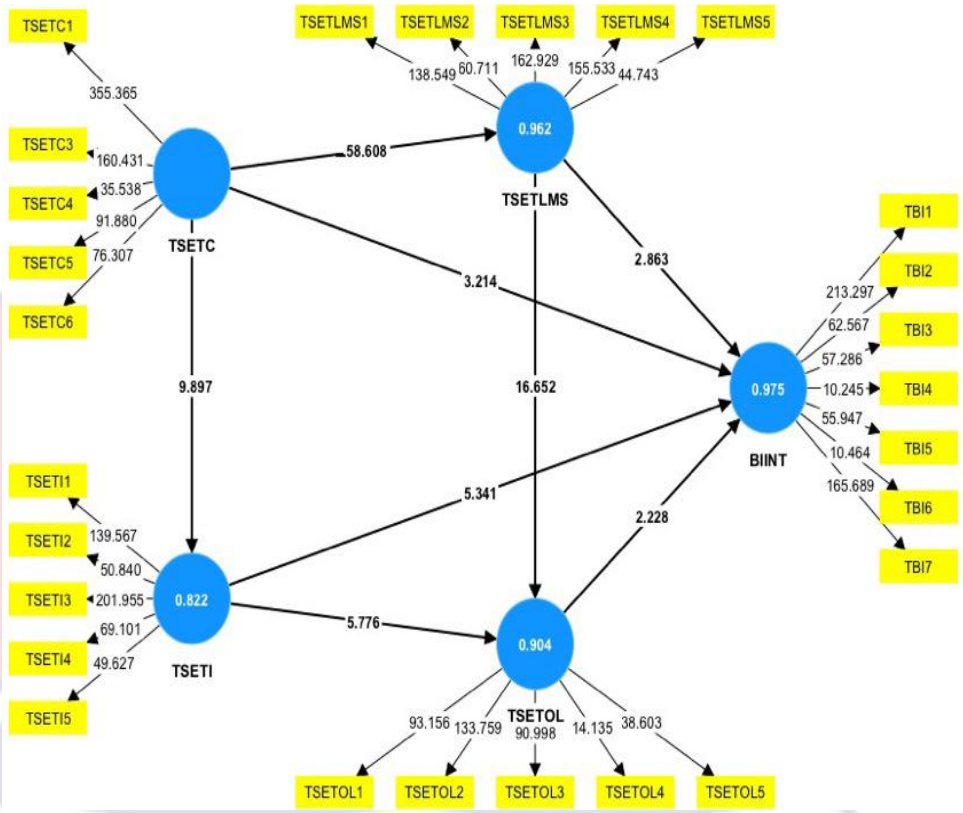

Figure 4: PLS- Bootstrapping results

PLS-SEM bootstrapping results obtained as indicated by Figure 3 enabled for the actual path analysis for testing of the hypothesis guiding the study. The statistical results of the bootstrapping sequence are presented in Table 5.

Path's Significance

The significance and supporting statistics of the hypothesized paths are depicted by Table 5.

Table 5: Path's Significance

Hypothesized Relationships	Beta Values	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	F Square	Confidence Interval LB 2.5	UB 97.5
1. TSETC -> TSETI	0.908	0.010	9.897	0.000	0.406	0.887	0.927
2. TSETC -> TSETLMS	0.981	0.004	58.608	0.000	0.561	0.973	0.988
3. TSETI -> TSETOL	0.591	0.100	5.776	0.000	0.450	0.394	0.796
4.TSETLMS -> TSETOL	0.480	0.088	16.652	0.000	0.297	0.306	0.656
5.TSETLMS -> BIINT	0.299	0.160	2.863	0.003	0.280	0.280	0.599
6.TSETC -> BIINT	0.415	0.124	3.214	0.001	0.175	0.186	0.674
7.TSETI -> BIINT	0.554	0.105	5.341	0.000	0.640	0.359	0.749
8.TSETOL -> BIINT	0.293	0.126	2.228	0.026	0.226	0.541	0.594

Results of the Path Analysis

The results from Table 5 revealed that teacher self-efficacy towards the computer has a significant relationship with teacher self-efficacy towards the internet (β = 0.908, t = 9.897, p = 0.000). This is evidence by the F squared of 0.406 and the significance p of 0.000 being less than 0.05. Moreover, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

Hypothesis 2: There is a statistically significant relationship between teacher self-efficacy towards computer and teacher self-efficacy towards LMS.

Based on the results in Table 5, it revealed that teacher self-efficacy towards computer has a significant relationship with teacher self-efficacy

towards learning and management system (β = 0.981, t = 58.608, p = 0.000): This is evidence by the F squared of 0.561 and the significance p of 0.000 being less than 0.05. Furthermore, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

Hypothesis 3: There is a statistically significant relationship between teacher self-efficacy towards internet and teacher self-efficacy towards online learning.

The results from Table 5 uncovered that teacher self-efficacy towards the internet has a significant relationship with teacher self-efficacy towards online learning (β = 0.299, t = 2.863, p = 0.003): This is evidence by the F squared of 0.450 and the significance p of 0.03 being less than 0.05. Additionally, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries correspondingly.

Hypothesis 4: There is a statistically significant relationship between teacher self-efficacy towards LMS and teacher self-efficacy towards online learning.

The result from Table 5 showed that that teacher self-efficacy towards learning management system has a significant relationship with teacher self-efficacy towards online learning (β = 0.480, t = 16.652, p = 0.000) were all supported. This is evidence by the F squared of 0.297 and the significance F of 0.000 being less than 0.05. Additionally, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin

of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

Hypothesis 5: There is a statistically significant relationship between teacher self-efficacy towards LMS and behavioral intention towards ICT integration in education.

Based on the result in Table 5, it uncovered clearly that teacher self-efficacy towards internet has a significant relationship with teacher self-efficacy towards online learning (β = 0.591, t = 5.776, p = 0.000): This is evidence by the F squared of 0.280 and the significance F of 0.000 being less than 0.05. Also, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

Hypothesis 6: There is a statistically significant relationship between teacher self-efficacy towards computer and behavioral intention towards ICT integration in education.

From Table 5, it uncovered clearly that teacher self-efficacy towards computer has a significant relationship with behavioral intention towards ICT integration (β = 0.41, t = 3.214, p = 0.001): This is evidence by the F squared of 0.1750 and the significance p of 0.001 being less than 0.05. As well, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

However, hypothesis 7: There is a statistically significant relationship between teacher self-efficacy towards internet and behavioral intention towards ICT integration in education.

From Table 5 above, it revealed that teacher self-efficacy towards the internet has a significant relationship with behavioral intention towards ICT integration (β = 0.0554, t = 5.341, p = 0.000): This is evidence by the F squared of 0.640 and the significance p of 0.000 being less than 0.05. Also, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

Hypothesis 8: There is a statistically significant relationship between teacher self-efficacy towards online learning and behavioral intention towards ICT integration in education.

Based on the result in Table 5, it uncovered clearly that teacher self-efficacy towards online learning has a significant relationship with behavioral intention towards ICT integration in education was supported. This is evidence by the F squared of 0.226 and the significance p of 0.026 being less than 0.05. Additionally, the significant results were further strengthened by the confidence interval of 97.5%, with a minor error margin of only 2.5% indicated by the statistics obtained from the upper and lower boundaries respectively.

Total Variance Explained by Model

Table 6: Total Variance Explained (R^2)

Dependent Variables	R-square	R-square adjusted
BIINT	0.975	0.973
TSETI	0.822	0.819
TSETLMS	0.962	0.962
TSETOL	0.904	0.901

The R-squared statistics explains the variance in the endogenous variables by the exogeneous variables. Simply, it explains how much changes in the dependent variables can be accounted by one or more dependent variable(s). the R-squared ranges from 0 to 1, with higher values indicating a greater explanatory power. As a general guideline, R-square values for endogenous latent variables are assessed as follows: 0.26 (substantial), 0.13 (moderate), 0.02 (weak). The results in Table 6 show that R-square for all endogenous construct is over 0.26, which shows that the model's explanatory power is substantial.

Discussion on Findings

The findings of the study indicated that teacher self-efficacy with computers significantly influences their self-efficacy with the internet. Thus, the role of teacher's confidence in computer cannot be underestimated as it ensures the successful integration of the internet into teaching and learning activities. This is because without computer, internet integration would be difficult. The internet ease computer usage by making it perform many functions but without a computer one cannot use the internet. On the other hand, teachers are more likely to integrate the internet into their teaching

activities the more computer-savvy they become and however, a teacher with low computer self-efficacy finds it difficult to incorporate the internet into their lesson plans. These findings agree with Bwalya and Rutegwa (2023) study which indicated that teachers become more confident integrating technology into their lessons the more they value its role in the teaching and learning process. A teacher who has experienced the value of technology in the classroom will approach its deployment with a positive attitude and complete confidence.

The findings for the second hypothesis showed that teacher's computer self-efficacy influences their proficiency with Learning Management System (LMS) suggesting that teacher's capacity to utilize computer would allow them build more competence in integrating Learning and Management System and however, without a computer, learning management system cannot be fully utilised. The foundation for integrating a learning management system in education is computer literacy. Due to the fact that teachers' computer proficiency is a prerequisite for having greater skills to integrate Learning and Management Systems. However, if a teacher lacks computer proficiency or confidence, he or she might be unable to integrate a learning and management system. This supports a study by Saha (2023) that found that a person's level of competence affects both task-specific and task-dependent technology use. This means that the confidence a teacher gets in a particular technology the more he/she utilizes it in his/her everyday task and vice versa.

The third hypothesis revealed a significant relationship between teachers' confidence towards the internet and online learning suggesting that both depends on each other for survival. Online learning typically involves the

use of the internet. Without the internet online learning cannot be possible. It can also mean that educators who possess internet-capable devices will be able to implement online education and instructors' inability to use the internet on the other hand, will prevent them from incorporating online learning into the classroom. These agree with a study by Fan and Lin (2023) which indicated that the ubiquitous use of the internet, however, raises the prospect that it can also be utilized more extensively for online learning, although its success depends on teachers' levels of self-efficacy.

The fourth hypothesis revealed that teacher self-efficacy towards LMS have a significant influence on teacher self-efficacy towards online learning suggesting that teachers' ability to utilize the LMS would be able to implement online learning because Learning and Management System is used to create online course. This conforms to a study by Lasfeto (2023) which indicated that using a learning and management system help teachers and give interested students access to online learning options.

The findings for the fifth hypothesis showed that teacher self-efficacy towards learning management system significantly influences behavioral intention towards ICT integration in education suggesting that teacher's ability to use LMS would help them to develop a good behavioral intention towards it. When they have a good behavioral intention, they will be able to utilise it in the classroom for teaching. On the other hand, teachers' who have low confidence in Learning and Management System would not be able to develop a good behavioural intention in implementing it in the classroom. These findings agree with Alfalah (2023) study which posited that teacher's attitude

towards a learning management system has a significant role in determining whether they really use the system or disregard it.

The sixth hypothesis revealed that teacher self-efficacy towards computer has a significant influence on behavioral intention towards ICT integration in education. This implies that teachers' capacity to use computers will allow them to acquire favourable behavioural intentions toward using ICT in education. In that regard, teachers with limited computer proficiency exhibit unfavourable behaviour intentions toward the use of ICT in the classroom and vice versa. These findings agree with Becirovic (2023) study which indicated that people who think utilising ICT will be simple, develop behavioural intentions to accept and use it.

The findings for the seventh hypothesis showed that teacher's internet self-efficacy influences their behavioral intention towards ICT integration in education. This suggests that teachers' capacity to use the internet will allow them to acquire favourable behavioral intentions toward adopting ICT in education and will be able to use the internet in the classroom for instruction. This support Becirovic 2023 study, which discovered a connection between teachers' opinions toward the internet and their preferences for and behaviors connected to embracing technology.

The eight-hypothesis revealed that teacher self-efficacy towards online learning has a significant influence on behavioral intention towards ICT integration in education. This means that teacher's ability to develop confidence in online learning would help them to develop a good behavioral intention towards implementing ICT in education. On the other hand, teachers' who have low confidence and ability in online learning would have negative

behavioural intention towards ICT integration in the classroom. According to Fishbein & Ajzen (2011), a teacher who has experienced the value of technology in the classroom will approach its deployment with a positive attitude and complete confidence.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

Chapter five places special emphasis on a summary of the research's findings, recommendations, and conclusions. The results of the data analysis are the conclusions. The topic of recommendations focuses on the steps that can be taken to address the issues found.

Summary of Findings

The summary of findings gives a brief information on the outcome of data analyzed from the research objectives. The study examined self-efficacy of teachers in integrating technology in teaching in SHS at the La-Nkwantanang Madina Municipality. In light of that, the following hypotheses were set by the researcher:

H_1: There is a statistically significant relationship between teacher self-efficacy towards computer and teacher self-efficacy towards internet.

H_2: There is a statistically significant relationship between teacher self-efficacy towards computer and teacher self-efficacy towards LMS.

H_3: There is a statistically significant relationship between teacher self-efficacy towards internet and teacher self-efficacy towards online learning.

H_4: There is a statistically significant relationship between teacher self-efficacy towards LMS and teacher self-efficacy towards online learning.

H_5: There is a statistically significant relationship between teacher self-efficacy towards LMS and behavioral intention towards ICT integration in education.

***H_6*:** There is a statistically significant relationship between teacher self-efficacy towards computer and behavioral intention towards ICT integration in education.

***H_7*:** There is a statistically significant relationship between teacher self-efficacy towards internet and behavioral intention towards ICT integration in education.

***H_8*:** There is a statistically significant relationship between teacher self-efficacy towards online learning and behavioral intention towards ICT integration in education.

However, the findings of the study uncovered that teacher self-efficacy with computers significantly influences their self-efficacy with the internet because without the computer, internet integration would be difficult. However, with regards to the second hypothesis, teacher's computer self-efficacy was uncovered to influence their proficiency with Learning Management System (LMS) because per the findings of the study teacher's capacity to utilize computer allow them to build more competence in integrating Learning and Management System and however, without a computer, learning management system cannot be implemented. The third hypothesis revealed a significant relationship between teachers' confidence towards the internet and online learning because per the findings both depends on each other for survival. Online learning typically involves the use of the internet and without the internet online learning could not be possible.

The fourth hypothesis revealed that teacher self-efficacy towards LMS have a significant influence on teacher self-efficacy towards online learning as teachers' ability to utilize the LMS per the findings would guide them to

implement online learning. The fifth hypothesis showed that teacher self-efficacy towards learning management system significantly influences behavioral intention towards ICT integration whiles the sixth hypothesis revealed that teacher self-efficacy towards computer has a significant influence on behavioral intention towards ICT integration in education. The findings for the seventh hypothesis showed that teacher's internet self-efficacy influences their behavioral intention towards ICT integration in education in light of the fact the findings of the study revealed that teachers' capacity to use the internet would allow them to acquire favorable behavioral intentions toward adopting ICT in education

Lastly, the eighth hypothesis revealed that teacher self-efficacy towards online learning has a significant influence on behavioral intention towards ICT integration in education.

Conclusions

The study examined self-efficacy of teachers integrating of technology in teaching at SHS in the La-nkwantanang Madina Municipality. Using the PLS structural equation modelling, this study confirms that there exists a relationship between teacher self-efficacy towards computer and teacher self-efficacy towards the internet; teacher self-efficacy towards computer and teacher self-efficacy towards LMS; teacher self-efficacy towards internet and teacher self-efficacy towards online learning; teacher self-efficacy towards LMS and teacher self-efficacy towards online learning; teacher self-efficacy towards LMS and behavioural intention towards ICT integration in education; teacher self-efficacy towards computer and behavioral intention towards ICT integration in education; teacher self-efficacy towards internet and behavioural

intention towards ICT integration in education and lastly; teacher self-efficacy towards online learning and behavioural intention towards ICT integration in education. It can therefore be inferred that teachers who have high abilities in technology can easily integrate it in their teaching activities and vice versa.

Recommendations for Policy and Practice

1. Teachers should receive ICT training as it is essential for them to feel confident using technology in the classroom.
2. Since a positive behavioral intention may result in the use of technology in education, it is crucial for instructors to have positive attitudes about technology in order to incorporate it into lesson plans.
3. Teachers in Ghana who are competent with computers should be encouraged by heads of schools to integrate the internet into their lessons because computers and the internet are closely related.
4. Given that there is a statistically significant relationship between teacher self-efficacy towards internet and teacher self-efficacy towards online learning, teachers should be given access to the internet for them to be able to incorporate it into the classroom.

Suggestions for Future Research

The following recommendations are made for future research;

1. Future studies could focus on ICT training and teacher's self-efficacy in ICT integration in educational activities
2. Future studies could employ qualitative research methods such as in-depth interviews, focus groups, and observations to obtain rich and detailed data on the subject matter

3. Future studies could use mixed-methods research designs to combine the strengths of both quantitative and qualitative approaches

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APPENDIX A

QUESTIONNAIRE FOR SHS TEACHERS IN THE LA-NKWANTANANG MADINA MUNICIPALITY

I am a student from the Department of Mathematics and Science of the University of Cape Coast. I am conducting research on the topic **"*Self-Efficacy of Teachers in Integrating of Technology in Teaching in SHS at the La-nkwantanang Madina Municipality*."**. The goal of this research is to explore teacher's self-efficacy in integrating technology in teaching. Please this is not an exam. There are no right or wrong answers. What is key is your views. Please respond to all the questions as best as you can by ticking [√] where applicable. You are hereby guaranteed of anonymity and that any information provided shall be remained private and be strictly used for the purpose of the study.

Thank you.

PART A: Demographic Characteristics of Respondents

1. **Gender**

a) Male [ ] b) Female [ ]

2. **Age**

a) 18-25 [ ] b) 26-35[ ] c) 36-45 [ ] d) 46-55 [ ] e) 56 and Above[ ]

3. **Departments**

a) General Science [ ]
b) General Arts [ ]
c) Business [ ]
d) Visual Arts [ ]
e) Home Economics [ ]
f) Agriculture [ ]

4. **Years of Service**

a) 1-4 years [ ] b) 5-8years [ ] c) 9 and Above [ ]

PART B

Section A: Teachers Self-Efficacy Towards Computers

Please indicate to what extent you agree or disagree with the following statement on teacher's self-efficacy towards computers

SD -Strongly Disagree, D- **Disagree**, U- **Undecided**, A- **Agree,** SA- **Strongly Agree**

	Statement	SD	D	U	A	SA
1.	I feel confident that I understand computer capabilities well enough to maximize them in my classroom					
2.	I feel confident that I have the skills necessary to use computer for instruction					
3.	I feel confidents that I can successfully teach relevant subject content with appropriate use of computer					
4.	I feel confident in my ability to evaluate software for teaching and learning					
5.	I feel confident that I can help students when they have difficulty with computer					
6.	I feel confident that I can effectively monitor student's computer use of project development in my classroom.					

Section B: Teachers Self-Efficacy Towards the Internet

Please indicate to what extent you agree or disagree with the following statement on teacher's self-efficacy towards the internet

SD -Strongly Disagree, D- **Disagree**, U- **Undecided**, A- **Agree,** SA- **Strongly Agree**

	Statement	**SD**	**D**	**U**	**A**	**SA**
1.	I am confident that I can use the internet to find any relevant material or resources for teaching					
2.	I consider myself capable of correctly incorporating internet in my teaching					
3.	I feel confident that I can effectively aid students to use the internet for class work					
4.	I feel confident that I have the skills necessary to use the internet for class activities and personal task accomplishment					
5.	I feel confident I can give assignments to be done using the internet					

Section C - Teacher's Self-Efficacy towards LMS

Please indicate to what extent you agree or disagree with the following statement on teacher's self-efficacy towards Learning Management System

SD -Strongly Disagree, D- **Disagree**, U- **Undecided**, A- **Agree,** SA- **Strongly Agree**

	Statement	**SD**	**D**	**U**	**A**	**SA**
1.	I feel confident directing my students to use virtual library					
2.	I consider myself capable of using Zoom app for class discussion					
3.	I consider myself capable of integrating Learning Management System into my instruction					
4.	I consider myself capable of designing online course					
5.	I feel confident that I can share and work together online with students in the classroom					

Section D- Teacher's Self-Efficacy towards Online Learning

Please indicate to what extent you agree or disagree with the following statement on teacher's self-efficacy towards online learning

SD -Strongly Disagree, D- **Disagree**, U- **Undecided**, A- **Agree,** SA- **Strongly Agree**

	Statement	**SD**	**D**	**U**	**A**	**SA**
1.	I am confident that I can facilitate learning in online environment					
2.	I feel confident that I have the right abilities to use online learning					
3.	I am confident that my ability to teach improves when I teach using online environment					
4.	I feel nervous about using online environment for teaching					
5.	I feel confident that I can share and work together online with students in the classroom					

Section E- Teacher's Behavior Intentions towards ICT Integration in Education

Please indicate to what extent you agree or disagree with the following statement on teacher's behavior intentions towards ICT integration in education

SD -Strongly Disagree, D- **Disagree**, U- **Undecided**, A- **Agree,** SA- **Strongly Agree**

	Statement	**SD**	**D**	**U**	**A**	**SA**
1.	I am willing to implement ICT in my class					
2.	I think the use of ICT improves the quality of teaching					
3.	I would recommend other teachers to use ICT for teaching					
4.	I think the use of ICT in teaching is a waste of time					
5.	I find teaching using ICT flexible that I will continue with it for as long as I am able					
6.	I think the use of ICT enables the students to be more active and engaging in the lesson					
7.	I think the use of ICT helps to prepare teaching resources and materials					

Thank you very much for your cooperation!