

UNIVERSITY OF EDUCATION, WINNEBA

**ASSESSING THE INTEGRATION OF INFORMATION AND
COMMUNICATION TECHNOLOGY IN TEACHING:
A CASE OF AWUTU SENYA WEST DISTRICT**



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2021

UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION – KUMASI

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COMMUNICATION TECHNOLOGY IN TEACHING: A CASE OF AWUTU
SENYA WEST DISTRICT**

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**A dissertation in the Department of Information Technology Education,
Faculty of Applied Sciences and Mathematics Education, submitted to the School of
Graduate Studies in partial fulfillment of the requirements for the award of the
degree of Master of Science (Information Technology Education) in the University
of Education, Winneba**

MAY, 2021

DECLARATION

STUDENT'S DECLARATION

I, KUADEBGEKU FREDERICK declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted either in part or whole, for another degree elsewhere

SIGNATURE:

DATE:



SUPERVISOR'S DECLARATION

I/We hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision for dissertation as laid down by the University of Education, Winneba

SIGNATURE:

DATE:

(DR. F. O. BOATENG)

DEDICATION

This project is dedicated to my lovely wife Salomey Odei, children Freda Enam and Faith Yayra, my siblings, colleague Lorlor Avornyoh and all those who contributed in one way or the other to support me make this thesis a success.



ACKNOWLEDGEMENTS

My sincere gratitude goes to the Almighty God for keeping me through this course, with his protection, guidance and support. To my supervisor Dr. F. O. Boateng I say thank you and may the good lord replenish whatever you lost in guiding me through this project. I would also like to sincerely thank all the lectures for the knowledge gained and the useful engagement throughout my study period.

I express my outmost gratitude to all my friends and loved ones for their support in diverse ways. Finally, to my family as they have been the source of this success and I say may the highest God bless and reward them accordingly.



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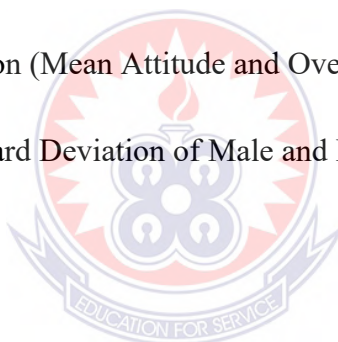
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ABSTRACT

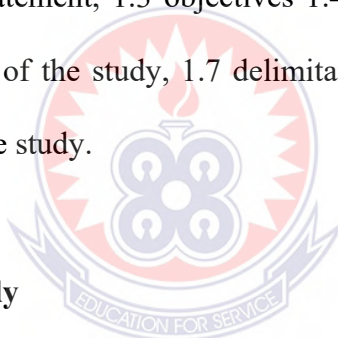
The study assessed the integration of information and communication technology in teaching and learning using data from senior high schools in the Awutu Senya District in Ghana. Simple random sampling technique was used to select teachers in the District. In all, one hundred and ten teachers were selected for the study. Self-administered questionnaire was used as an instrument for the study. SPSS version 20.0 was the software's used for the data analysis. Frequency tables and pie charts were also used in presenting the data. Conclusions from relevant related literature were captured along to authenticate the findings of the study. The findings revealed that most of the teachers' attitude influences their integration of ICT in teaching. This was revealed among other factors through teachers desire to use ICT tools and the frequency with which these tools were used. it was further revealed that most of the teachers used in the study have received training on ICT before and it influences their decision to integrate them in their teaching. The findings further showed that majority of the teachers do not have time to prepare for their teaching using ICT tools because of their workload. The study concluded that the use of ICT has not been adequately integrated into teaching and learning in the district.

CHAPTER ONE

INTRODUCTION

1.0 Overview

The focus of this study is to assess the factors influencing the integration of ICT in teaching in Senior High Schools. This has become necessary due to the integral role of ICT in modern teaching and learning. All over the world, ICT is heavily adopted for teaching and learning purposes. Though there is an ongoing debate on how technology has been assimilated in the Ghanaian educational spectrum, little attention has been paid to the perspectives of teachers. To delve more into how ICT is integrated into teaching in the Ghanaian High schools, the current section is divided into the following: 1.1 background, 1.2 problem statement, 1.3 objectives, 1.4 research questions, 1.5 research hypothesis, 1.6 significance of the study, 1.7 delimitations, 1.8 definition of terms and finally the organisation of the study.



1.1 Background to the Study

The ascendancy and expeditious development of Information and Communication Technology (ICT) has transformed society from the information technology age to the innovation-driven age (Ahiatrogah & Barfi, 2016). According to Ahiatrogah and Barfi (2016), ICT plays an important role in the development of a country when we take into account the social, cultural and economic role of computers. It is widely acknowledged that ICT can be used to improve the quality of teaching and learning. ICT is becoming a natural part of man's daily life; thus, their use in education by teachers is becoming a necessity.

There is a growing demand on educational institutions to use ICT to teach students in the 21st century (Shiboko, 2015; Kirschner & Woperies, 2003). Realizing the

effect of ICT at the workplace and everyday life, today's educational institutions are trying to restructure their educational curricula and classroom facilities so that the existing gap between teaching and learning can be bridged (Robbins, 2008; Pierson, 2011).

Papaioannon and Charalambous (2011) observe that the use of ICT in school can motivate students, stimulate their interest, increase their self-confidence and self-esteem, increase their creativity, allow greater interactivity, enhance their critical thinking and increase their attainments among other benefits. In a similar vein, Laaria (2013) notes that the use of ICT in teaching can enhance teacher's efficiency and enthusiasm to encourage their planning and cooperation, help them adopt student centered teaching strategies and reduce their workload.

The governments in sub-Saharan Africa, as elsewhere have emphasized on teacher development as the key to effective implementation of policy and curricular using ICT to enhance teaching and raising educational standards (Shiboko, 2015). ICT integration is primarily an individualized approach to teaching which allows students to work independently developing self-independence which encourages mastery of learning (Bell, 2016).

The government of Nigeria has recognised the pivotal role of ICT in the revitalization and development of the country's education system (Shiboko, 2015). Teachers perceive the use of ICT as useful and using computers makes teaching and learning easier. According to Robbins (2013), ICT integration in the Nigerian school system came with the 2001 National Policy on Information Technology tagged "Use IT."

Similarly, in 2011, Kenya launched a National ICT Innovation and Integration Centre (NI3C) at the Nairobi University's Kenya science campus. The centre was expected to enable developers demonstrate the application of ICT technologies and new

pedagogic aspects of ICT in teaching and learning. The centre was also expected to provide guidance to education managers on ICT innovations an integration aspect to support teachers in their lesson delivery.

In Ghana, the use of ICT is spreading very fast across all age barriers (Ahiatrogah & Barfi, 2016). It has been noticed that the use of ICT in teaching can boost education delivery. Teaching and learning has been made much easier with the use of ICT in schools (Boakye, 2017). According to Boakye (2017), the use of ICT in teaching have nurtured students who are able to engage themselves actively and committed in their own learning, who again develop new ideas collaboratively with passion for learning.

The Government of Ghana has therefore developed a policy on ICT usage in education. However, the success of this project has implications for attitudinal change and display of its use by teachers. Simply having laptops in schools will not guarantee their effective use. Regardless of the quantity and quality of technology placed in classrooms, the key to how those tools are used is the teacher. Therefore, teachers must have the competence and have the right attitude towards technology and its integration into teaching and learning. According to Farrell (2017), proper training of teachers on how to implement ICT offers crucial advice on selection, integration and evaluation of computer tools to support teaching and learning.

Attitude of teachers such as computer avoidance, anxiety, self-efficacy, enthusiasm and confidence hinders the process of integration of ICT in teaching (Ertmer, 2009). If teachers have positive attitudes towards the use of technology then they can easily provide useful insight about integration of ICT in teaching and learning process. Teachers' workload also influences the integration of ICT in teaching, in the sense that when a teacher has many lessons per week, there will be no free lessons to prepare for ICT related content (Abuhmaid, 2011).

The country is yet to fully implement all the various facets of the Anamuah-Mensah Educational Reform which was proposed in 2002. Currently, the educational system consists of six years of Primary School, followed by three years of Junior High School (JHS) and three years of Senior High School (SHS). Kindergarten (Pre-School) has been integrated fully into primary education which would have made it eleven years of basic education.

Ghana has developed a national framework on which the deployment of ICT in the education sector is to be based. This framework is contained in the Information Communications Technology for Accelerated Development (ICT4AD) document (Republic of Ghana, 2003) developed under the able chairmanship of Professor Clement Dzidanu. The ICT4AD policy seeks to provide a framework in which information and communication technologies will be used to transform the educational sector, allowing all Ghanaians to pursue quality lifelong learning opportunities regardless of their geographical location.

At this juncture, it is critical that policy makers ensure that ICT does not become another tool for perpetuating educational inequalities considering the fact that presently not all educational institutions in Ghana have access to ICT facilities. However, there exists a knowledge gap on the factors influencing integration of ICT in teaching of teachers. It is against this background that the study seeks to examine the factors influencing the integration of ICT in teaching at the secondary school level.

1.2 Statement of the Problem

Many Senior High Schools (SHSs) have access to computers courtesy the various governments' spear-headed initiatives, development partners and individual schools (Shiboko, 2015; Owusu-Ansah, 2015; Yusuf & Yusuf, 2017). The government of Ghana

has been trying to provide teachers and students with free laptops to improve teaching and learning. Within the Awutu Senya West District some teachers have access to the better Ghana agenda laptops, but some of these teachers do not use them for teaching purposes (Ahiatrogah & Barfi, 2016). However, the paces of ICT integration in SHSs have not been fast enough. Senior High School (SHS) teachers, particularly those in Awutu Senya West District are still rooted in the traditional instructional approaches and as a result they are not making the necessary efforts to integrate ICT in teaching and learning purposes

There are many efforts that have been made by the government of Ghana to improve integration of ICT in various subjects. This includes initiatives such as in-service training of teachers through workshops organized by various stakeholders in the Ministry of Education. Besides, the government through the Ministry of Education (MoE) has put in place initiatives to facilitate integration of ICT in teaching and learning (Jones, 2001). Although many public SHSs in Ghana, including those in the Awutu Senya West District have received computers, their use in the classroom level is limited due to issues affecting integration. The implication is that the actual extent to which ICT has been integrated into teaching and learning has not received research attention. However, many people have varied reasons to the limited level of ICT integration in teaching and learning. While others focus on attitude (Owusu-Ansah, 2015), others have attributed the problem to lack of trained professionals (Yusuf & Yusuf, 2017). Moreover, others argue that the workload of teachers makes it difficult to integrate ICT in teaching and learning (Owusu-Ansah, 2015; Yusuf & Yusuf, 2017). There is therefore the need for the study to look into assessing the factors influencing the integration of ICT in teaching in Awutu Senya West District.

1.3 Objectives of the Study

The main aim of the study is to assess the factors that influence the integration of ICT in teaching in Senior High Schools. The study seeks to achieve the following specific objectives:

1. To examine Senior High School teachers' attitudes towards the integration of ICT in teaching.
2. To establish the extent to which Senior High School teachers have been trained towards ICT integration in teaching.
3. To determine the extent of workload of Senior High School teachers amidst the ICT integration in teaching.

1.4 Research Questions

In order to address the specific objectives, the following questions were formulated to guide the study:

1. To what extent does Senior High School teachers' attitude influence the integration of ICT in teaching?
2. To what extent does Senior High School teachers' training influence the integration of ICT in teaching?
3. To what extent does Senior High School teachers' workloads influence the integration of ICT in teaching?

1.5 Research Hypotheses

The research was guided by the following hypotheses:

The attitude of teachers towards ICT adoption has no statistically significant effect on their training received on ICT.

There is no statistically significant difference between the integration of ICT in teaching of male and female teachers.

1.6 Significance of the Study

A study into the factors influencing integration of ICT in teaching in Senior High Schools will make some contribution to the existing knowledge. At the end of the study, it is hoped that teacher's attitude level in integrating ICT in teaching will be improved and their entire performance gap in teaching ICT will be addressed.

The essence of any research is to address the void in our minds to add new knowledge to the existing ones. It is expected that the results of the study will help policy-makers or curriculum developers in Ghana to determine ICT programmes and strategies to improve the current methods of teaching with ICT in the secondary schools. This study may also help to raise awareness among Policymakers, Directors of Education, Head teachers and teachers, about the barriers to ICT integration that exist in the SHSs. A thorough understanding of barriers, will inform educators, in deciding how to address them, with the hope that they can be minimized if not eliminated entirely.

1.7 Delimitation of the study

The study covered only selected senior high school teachers Awutu Senya West District. The findings of study will be generalised with caution. The study covers factors influencing the integration of ICT in teaching at Awutu Senya West District. Thus, the use of ICT tools for teaching, requisite skills and barriers teachers' encounter when using ICT in teaching were the delimitations. The limitations of this study warrant discussion and suggest the need for caution when interpreting the results. The findings of this study

cannot be generalized to all SHSs in Ghana because of the sampling procedure that was used for selecting the teachers.

The study encountered some challenges which included the response rate of the respondents, vacations when schools are closed, teachers might be difficult to reach to respond to the questionnaire and teachers' unwillingness to participate in the study could affect the study. These variables cannot be controlled and therefore they could affect the final results of the study. Measures were however taken to minimize the effects of these on the final results of the study. The teachers were told of the benefits of the study and this convinced them to participate in the study.

1.8 Definition of Terms

Attitude: A predisposition or a tendency to respond positively or negatively towards a certain idea, object, person or situation (Kadel, 2015).

ICT: Information and Communication Technology, which means computers, mobile or cellular phones, digital cameras, satellite navigations systems, electronic instruments and data recorders, radio, television, computer networks, and almost anything which handles and communicates information electronically (Milken, 1999).

ICT integration: This refers to a range of learning environments from a stand-alone computer in a classroom to a situation where the teaching is done by the computer through pre-packaged "teacher-proof courseware" (Laferriere, 1999).

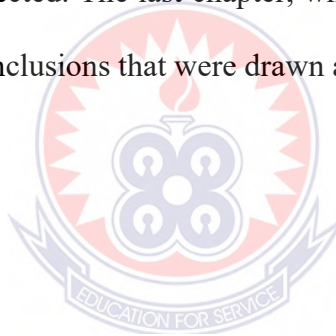
Teacher factors: This refers to the features of the teacher and the teaching profession that affects integration of ICT in teaching.

Teacher training: This refers to the professional preparation of teachers usually through formal course work and practice teacher.

Teacher workload: This refers to the total amount of time a teacher spends teaching, planning lessons and marking student work.

1.9 Organisation of the Study

The study is organized into five chapters. The first chapter talks about the background to the study, the statement of the problem, the research objectives and questions. The chapter also deals with the significance of the study, the delimitations and limitations encountered in the study. The second chapter deals with the review of the related literature and the theoretical framework. The third chapter talks about the research methodology that was used in the study. The fourth chapter dealt with the presentation and analysis of the data collected. The last chapter, which is chapter five talks about the summary of findings, the conclusions that were drawn and the recommendations thereof.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

This chapter is devoted to the review of literature related to the integration of information and communication technology in teaching. For easy referencing, this literature is reviewed under the following sub-headings: Theoretical Framework, ICT Policy in Education, Policy on ICT Education in Ghana, Education and ICT, The Concept of ICT and its Impact on Teaching and Learning, Attitude of Teachers towards Teaching with ICT, Teacher Training and Integration of ICT in Teaching and Teachers' lesson workload and integration of ICT.

2.1 Theoretical Framework of the Study

The study is underpinned by Rogers' diffusion of innovations theory (Rogers, 2003). Rogers' diffusion of innovation theory was originally designed as an explanatory structure of adopting technology in education and educational environments (Medlin, 2001). According to Parisat (2010), the diffusion of innovation is a theory that seeks to explain how, why and at what rate new ideas and technology spread through cultures. Rogers argues that the diffusion is a process by which an innovation is communicated through certain channels over time among participants in a social system to integrate ICT into teaching. He further argued that the origins of the diffusion of innovations theory are varied and span multiple ways. The four elements in the diffusion of innovations theory are: innovation, communication channel, time and social system.

In the view of Rogers (2003), innovation is an idea, practice, or project that is perceived as new by an individual or other unit of integrating ICT in teaching. According to him, a communication channel is a means by which messages get from one to another

and time refers to length of period or duration required to pass through the innovation decision process. Rogers (2003) further defined a social system as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal.

According to Rogers (2003), the innovation decision process has five steps which are: knowledge which refers to an individual awareness of an innovation technology and having an idea of how it works. Persuasion is the second stage and it occurs when the individual has a negative or positive attitude toward the innovation technology (Rogers, 2003). According to Sherry (2011), teachers usually seek for information about a new innovation technology that is usually available from experts.

The decision stage is the third one whereby an individual chooses to adopt or reject the innovation, that is, by engaging in activities that lead the choice to adopt or reject the innovation (Rogers, 2003). The implementation stage is the fourth where the innovation is put into use by the user. The implementer may need technical assistance from change agents and others to reduce the degree of uncertainty about the consequences. Finally, the confirmation stage is where a user evaluates the results of an innovation decision already made (Sherry, 2011). This compels the user to continue adopting the technology for use or later on reject the technology in teaching.

The theory of Diffusion of Innovations naturally takes a different approach compared to other theories which are within the same concept of integration. Instead of focusing on persuading the user to change, it sees integration as primarily being about the evolution or “reinvention” of products and behaviour on how to use the technology. The study therefore employed the Everett Rogers Diffusion of Innovations theory to investigate the factors influencing integration of ICT in teaching in Senior High Schools. The theory is applicable in the study as the theoretical processes have a bearing on the quality of education.

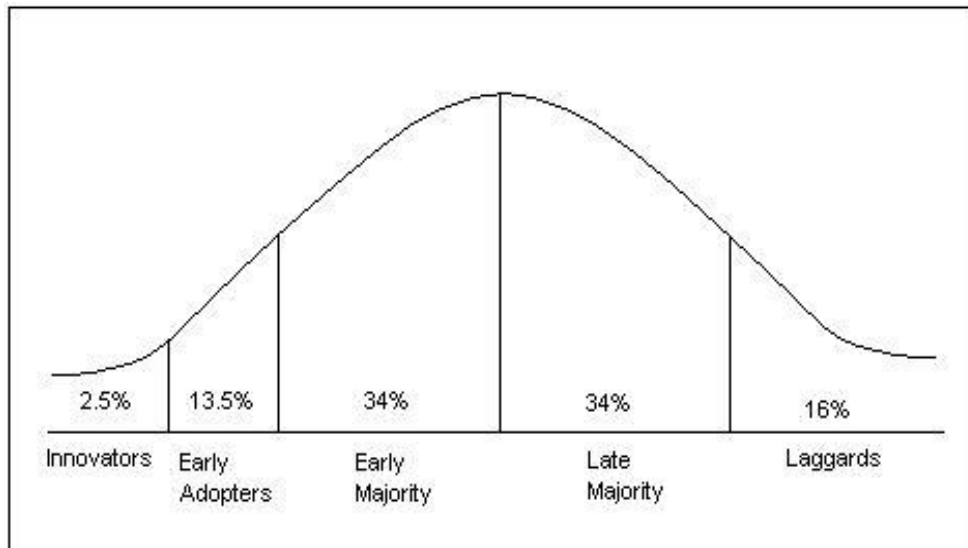


Figure 2.1: Adopter categorization on the basis of innovativeness

2.1.1 ICT Policy in Education

The term ICT policy connotes a range of learning environments in a classroom to a situation where teaching is done through pre-packaged “teacher-proof courseware” arrangement to follow (Laferriere, 1999). Information and Communication Technology (ICT) policy refers to the rules and regulations set by an organization or country in regard to ICT. Hawkins (2004) noted that while many ministries of education around the world have made the commitment to computerize schools; few have developed coherent strategies to fully integrate the use of computers as pedagogical tools in the classroom. In Africa, only a couple of countries have established a comprehensive policy for integration of ICT in education.

The fact is that, in modern times, Information and Communication Technology refers to the process of gathering, accessing and disseminating data for an enhanced learning (Miller & Akume, 2015). According to Miller and Akume (2015), education has also been made simple through the application of strong applied ICT policies. The

developed ICT policy must be seen as an evolution and more usage of ICT by the government, business, industry and other academic courses.

The ICT policy for the education sector document consists of the following components, each with its own statement of strategic objectives and expected outcomes: digital equipment, connectivity and network infrastructure, access and equity, integration of ICT in education and research development (Cuban, 2011). The ICT policy stipulates the human resource capacity for ICT through improved ICT integration in education (Working Draft-Information and Communication Technology Sector Policy guidelines, 2013). According to them, the policy also suggests the fiber optic network expansion to cover schools and progressively roll out free WI-FI in major towns. This will have a positive impact on integration of ICT in teaching.

Countries have been investing considerably in terms of money, expertise, resources and research to integrate technology in education to achieve their policy target (Cuban, 2011). The achievement will possibly make classroom environment more conducive for enhanced teaching and learning. According to Dion (2015), the success of the ICT policy in a country will make a reality by the integration of ICT in education, since education prepared future citizens to learn and use ICT in their day to day activities of life.

According to policy makers, ICT integration, takes place when teachers know how to incorporate and use ICT to teach in the classroom (Cuban, 2011). The assumption here is that once the teachers know how to use ICT to teach, the students will become engaged in using ICT as a tool to learn.

2.1.2 Policy on ICT Education in Ghana

The Ghanaian government through its ICT for Accelerated Development (ICT4AD) policy emphasised ICT use in order to bridge the digital divide between

Ghana and the developed world. The main objective of ICT in the education sector is to improve the quality of education and training and to make the educational system responsive to the needs and requirements of the economy and the society with specific reference to the development of information and knowledge-based economy (MoE, 2015: MoE, 2008; Mangesi, 2008). As a result, the Ghanaian Ministry of Education (MoE) has puts more emphasis on the introduction of ICT at the pre-tertiary level to enhance teaching and learning as well as teaching ICT skills to all students in order to prepare students for future ICT professions and lifelong learning (MoE, 2015).

The ICT4AD policy initiative implies a systematic and a collaborative plan which focuses on providing ICT facilities in all schools and Internet connections, building teacher confidence and ICT competencies through professional development programmes and encouraging stakeholders such as private organisations, NGOs, parent-teacher associations and students associations to collaborate in the successful integration of ICT in education (MoE, 2015). The commitment of the Ghanaian government to roll out and integrate ICT in teaching and learning is evident in its ICT4AD policy stipulations for educational goals. However, the big challenge lies in the reliance on international partners for financial and technical support which can lead to the early demise of the projects once the initial funding runs out (MoE, 2015).

The government of Ghana has acknowledged the need for ICT training and education in the schools and the improvement of the education system as a whole (MoE, 2008). The development of ICT into education will result in the creation of new possibilities for learners and teachers to engage in new ways of information acquisition and analysis; ICT will enhance access to Education and improve the quality of education delivery on equitable basis.

Again, the government of Ghana has developed comprehensive programs that aim at the utilization of ICT within the education sector. This will help to transform the educational system and thereby improve the lives of Ghanaians. Through the implementation and utilisation of ICT in education, the culture and practice of traditional memory-based learning will be transformed to education that stimulates thinking and creativity necessary to meet the challenges of the twenty first Century (Ministry of Education, 2008).

The fundamental objective of the policy is to ensure that the Ghanaian education sector provides adequate opportunities for Ghanaians to develop the necessary skills, regardless of the levels of education (formal and non-formal), to benefit fully from the Information Society (Ministry of Education, 2008). The policy goals include the following:

1. Facilitating the deployment, utilization and exploitation within the educational system to improve on educational access and delivery to support teaching and learning from the primary level upwards.
2. Modernize the educational system to improve the quality of education and training at all levels of the educational system and expanding access to education, training and research resources and facilities.
3. To orient all levels of the country's educational system to the teaching and learning of science and technology in order to accelerate the acculturation of science and technology in society and produce a critical mass of requites human resources and a well-informed citizenry.
4. To achieve universal basic education and improve the level of basic and computer literacy in the country.

5. To ensure a population in which all citizens are at least functionally literate and productive.
6. To expand and increase access to secondary and tertiary education.
7. To strengthen science education at all levels and in all aspects of the educational system, especially at the basic and secondary levels.

The efforts to introduce ICTs into the sector by the Ministry (primarily through the GES), its development partners and other private sector agencies cover over ten (10) years. Initiatives have spanned pre-tertiary (both public and private schools) and tertiary. Efforts have largely been geared towards the deployment of ICTs to these facilities via the provision of computers and the establishment of ICT laboratories. Access however is still below the standards and numbers demanded.

Additionally, there have been several private sector initiatives to set up Community based ICT centers. These however have been largely confined to urban areas with few available examples of how they have been used to support educational objectives. In a study carried out to review and assess the ICT in Education Initiatives in Ghana (2005), twenty initiatives were selected and their impact assessed to see what lessons could be learnt. Several positive achievements were noted.

Initiatives contributed to a wider number of students and teachers acquiring ICT skills and developing strong interests in ICT and Science;

Schools involved in the initiatives were motivated to expand the project and/or acquire more ICT equipment; a number of private-public partners, including Parent Teachers Associations (PTAs) and civil society collaborated in the efforts; Lessons learnt from initiatives provided good examples for other schools to introduce their own ICT programs;

However, the projects themselves faced a number of challenges. At least half of the initiatives had been launched as pilots with none expanded into national initiatives. Implementation challenges include: Poor selection of schools without the involvement of GES/MOE resulting in duplication and hence some schools having several parallel initiatives while others (especially those in the remote rural towns) had none

Lack of policy direction at all levels (schools, districts, national) for the integration of ICT in education; Heavy dependency on external funds, with most initiatives stopped after depletion of initial funding 'Dumping' of obsolete and inappropriate equipment as support' for the initiatives.

Low levels of ownership at the level of the schools, due to external motivations, and low levels of understanding on the part of recipients about the potentials of ICTs in education. Lack of trained ICT personnel (including teachers) far below the numbers demanded to support the initiatives with most capacity building efforts one-off with no continuous trainings planned for. Additionally, there was the recognition that to ensure success and sustainability, ICT in Education projects should be implemented not necessarily to increase the number of computers, but should instead be based on supporting discrete educational objectives. The lessons learned from the initiatives further highlighted the need for a coordinated, focused and properly managed approach to the adoption and utilization of ICTs. Such an approach could further improve the accessibility and delivery of quality education and better maximize the impact of ICTs in Education.

In spite of establishing computer laboratories and the provision of essential ICT material, the Ghanaian MoE (2015) reported that another challenge experienced is the lack of policy direction at schools, at both district and national level, on how to integrate ICT in education. According to the MoE (2015), this creates problems within schools

and ICT teachers have no clear directives on what to do with the ICT tools. Well-resourced schools are integrating ICT into teaching and learning with ease whereas rural schools are left with challenges that hinder the implementation of technology in education (Mangesi, 2008). In a similar vein, Malcolm and Godwyll (2008) concurred stating that the major challenges in ICT integration in Ghanaian schools are high learner-computer ratios, computer breakdowns, inadequate motivation and unreliable Internet connectivity.

2.1.3 Education and ICT

The best education is to be found in getting the best information from educative tools to support teaching and learning in various schools (Museveni, 2014). Educational technology provides aids for teaching and learning; however, they can never be substituted for learning itself (Ayo, 2011). In education, greater emphasis is put on the versatility, accessibility, availability and adaptability of learning materials or tools/aid that supports teaching (Almarzooqi, 2016). According to Almarzooqi (2016), ICT is a valuable teaching aid for accomplishing tasks that are logically distinct from the tool itself in education. ICT integration in the classroom is the use of technology to assist, enhance and extend users' knowledge using ICT tools (Omwenga, 2004). Using ICT tools or aids in education means more than simply teaching users' how to use computers (Parthemore, 2003). According to Parthemore (2003), technology is a means for improving education and not an end in itself.

In fact, teaching using different learning styles with the support of ICT tools will help teachers to reach each student during classroom lessons. Teachers, who employ ICT in teaching and learning, use various teaching strategies in order to connect the learning style of each student in the classroom (Kozma, 2015). Pelgrum (2001) argues

that students learn more and retain information longer, when they learn in a manner that is comfortable to them with the support of ICT tools or aids. Pelgrum (2001) further revealed that, teachers use resource-centred approaches to help students gain knowledge by combining both visual and auditory senses with the support of ICT resources or tools. This makes learning attractive to students.

The use of ICT in teaching began some years or decades ago (Pelgrum & Law, 2003). The use of ICT became popular in the 1980's when personal computers became available to consumers for personal use (Teye, 2012). This has motivated government agencies across most countries to use these devices in teaching and learning. Kozma (2015) and Leech (2014) have pointed out that the use of ICT in teaching has encouraged global competition among nations to influence governmental policies in ensuring that they keep pace with these technological advancements.

These policies motivated the mass production of computers for schools. Towards the end of the 1980's, the term 'information technology' began to replace the word 'computer' in most instances (Pelgrum & Law, 2003). The term information technology is explained as computer's processing ability, indicating a shift from computing technology to the ability or strength to store and retrieve information. Pelgrum and Law (2003) further argued that the enhancement of ICT signaled the introduction of email and electronic messaging with computer technology with the help of the various Internet service providers (ISP).

Technology use in education is becoming an increasingly important part of the education system (Wernet, Olliges & Delicath, 2017; Almekhlafi, 2006). Through the use of ICT, teachers can have a look at the way they teach and modify the instructions with videos. Lam and Lawrence (2002) have observed that the use of ICT in teaching

and learning not only gives students the opportunity to control their own learning process, but also gives them the opportunity to access vast amount of information

The acquisition of knowledge in ICT by students will help them in their research, assignment and learning. Teachers can also use the services of ICT to write lesson notes and prepare materials for teaching and learning. Thus, computers have become a routine tool for helping teachers and students accomplish their work successfully (Becker, Ravitz & Wang, 2009).

2.2 The Concept of ICT and its Impact on Teaching and Learning

According to IMPICT (2012), ICT is the process of gathering, creating, processing, and storage of information by using hardware, software, as well as the internet and global system of mobile communication (GSM). However, the communication aspect of ICT is assuming more significance now than ever before, hence, it is now more appropriate to use the expression ICT rather than mere information technology which has become the back bone of the new information based global economy (Quarshie, 2014).

Today, development has brought about evaluation of ICT, which is ever growing and continuously affecting every aspect of human endeavour (Abifarina, 2003). Thus, the teacher using ICT in the class will be able to present a well-planned set of lessons and the students will experience these lessons in an exciting environment. Ojo (2005) notes that the misconception that the computer will replace the teacher and thus render them redundant does not arise; all the computer does is to reinforce and enhance the teacher's lessons. ICT can help students to become independent learners capable of developing critical thinking and problems-solving strategies, collaborative works and inquiry. It allows for information searches, computer modelling, team-work, brain-

storming and revision. Teachers can use computers to make learning experiences more effective and to offer students access to a variety of learning tools, expert opinions and alternative viewpoints (Quarshie, 2015).

Idahosa and Ero (2005) states that in computer assisted instruction; lessons production is guided by the learners' knowledge, skills, understanding, expectations as well as motivation. This implies that a computer is not an instructor in itself but rather a mere vehicle of instruction. It is a clear secret that the computer offers powerful features for facilitating learning. Utor and Agbi (2006) identifies telecommunication and teleconferencing as another useful development in ICT where students can sit in their respective classrooms or research centres and partake in teaching without necessarily visiting each other.

ICT play a critical role in socio-economic development because they are being used to achieve sustainable development (Quarshie, 2015). That is, ICT sustains development by enhancing the following:

Improvement of institution information management, inter institutional communication, communication between regional or state cooperation institutions and their organizations thereby facilitate integration; Promote trade, financial cooperation, agricultural development, educational research, environmental protection etc.

ICT could also catalyse trans-border data flows bringing down barriers to personal communications and removing the constraints of national boundaries, physical disabilities as well as distance. By providing access to network, ICT reduces the costs of international communication among countries.

2.3 Attitude of Teachers towards Teaching with ICT

Research studies have shown that effective use of ICT is dependent on the teachers' intentions, personal beliefs and attitudes towards teaching with technology and ICT use (Divaharan & Ping, 2010; Ozden, 2017). Teachers' attitudes towards technology greatly influence their acceptance of the usefulness of technology and its integration in teaching.

Simply having ICT in the various schools will not guarantee their effective use in teaching and learning process (Ahiatrogah & Barfi, 2016). Regardless of the quantity and quality of technology placed in classrooms, the key to how those tools are used is the teacher; therefore teachers must have the right attitude towards ICT (Kadel, 2015). Attitudes refer to one's positive or negative judgment about a concrete subject (Kadel, 2015). There is a common saying that attitude determines altitude. Attitudes are determined by the analysis of the information regarding the result of an action and by the positive or negative evaluation of these results (Ajzen & Fishbein, 2000).

Studies have established close links and affinities between teacher's attitude and their use of ICT for teaching. High teacher's positive attitudes towards the ICT were associated with a higher level of computer experience (Dyck & Smither, 2005; Teo, 2008). Teachers' confidence in ICT can be explained through the attitude and behaviour of teachers. Teachers' behaviour is a critical influence on teachers' confidence and attitude towards ICT as they provide important role model to their students and themselves as instructors (Derbyshire, 2003).

Attitude of teachers towards computer and technology skills can be improved by integrating technology into teacher education (Zammit, 1992). Findings have revealed that a significant relationship exist between teachers computer attitude and its use in classroom teaching (Beauchamp, 2012; Khine, 2001; Becker, Ravitz & Wong, 2009).

Attitude is a major predictor of teachers' future ICT for classroom delivery. Sutherland (2015) and Lee (2013) studies indicated the importance of appropriate responses to teacher's feelings about using ICT as one of the factors critical to teacher's integration of ICT for teaching.

Teachers who have positive attitude and are highly enthusiastic about interactive teaching aids or tools for teaching are motivated to practice using ICT for lesson delivery (Kennewell & Morgan, 2003). Teachers need to be skilled in the use of ICT and also to be able to critically evaluate strategies for the acquisition and the appropriate application of ICT in diverse curriculum area (Ittigson & Zewe, 2013; Robbins, 2008).

Many countries and agencies are developing and guiding professional development so that majority of teachers can be prepared to use ICT in their teaching. UNESCO has been working to produce guidance for less favoured countries at the request of their governments (UNESCO, 2008). A World Bank report also identifies ICT in teacher education as a key issue, especially in the preparation of aspiring teachers (Hennessy, 2010). Many developed countries are also promoting initiatives for ICT in teacher education (Snyder, 2015) and, in their final report; they noted that ICT for teaching can prepare educators to use information and communication technologies effectively.

Davis and Tearle (2016) reviewed frameworks for ICT in teacher education to inform European Commission research objective of a 'Core Curriculum' for ICT in teacher education (then known as Telematics for Teacher Training, or T3). According to Davis and Tearle (2016), they noted that many countries around the world were taking action to ensure that their educational systems were updated to permit equality of access and to ensure that key ICT skills were developed in schools and other educational institutions to be used by teachers. They also noted that it was becoming abundantly

clear that the training of teachers in ICT skills and appropriate pedagogical approaches was essential for teachers to integrate ICT in their teaching processes (Wernet, Olliges and Delicath, 2017).

A number of previous studies around the world has reveal that a considerable number of teachers hold negative attitudes which are geared towards implementation hence integration of ICT in schools. These attitudes most often than not range from computer avoidance, anxiety, self-efficacy, enthusiasm, confidence, liking and usefulness of computer towards personal and social life (Manduku, 2012; Makhanu, 2010; Lau & Sim, 2008; Jimoyiannis & Komis, 2007). Age, gender, training, access to a computer, years of computer use and ownership of computer are also considered as some of the variables used to evaluate attitudes of teachers towards integration of ICT.

Teacher's attitudes and beliefs toward technology are among the factors that influence successful integration of ICT into teaching (Hew & Brush, 2017; Keengwe & Onchwam, 2018). If teachers' attitudes are positive towards the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. A negative attitude towards technology on the other hand among teachers is a key obstacle to successful integration. It has not been established whether attitude of teachers influences integration of ICT in teaching of ICT in secondary schools. This research study intends to fill this gap.

2.3.1 Teacher Training and Integration of ICT in Teaching

Teachers ICT skills and access to professional development is critical to integration of ICT in teaching in the classroom. In the view of Hennessy (2010), when teachers view ICT programs as either satisfying their own needs or their students' needs, it is likely they will integrate it in their teaching. A needs assessment is important to find

out what ICT skills and knowledge teachers need at schools. Designers of university education programs for teachers should know teachers perceptions of ICT and their attitudes towards ICT integration into curriculum (Murphy, 2013).

New ICT tools and teaching approaches call for the training of teachers (Osborne & Hennessy, 2003). According to them, when teachers are insufficiently trained they will not be confident enough to integrate ICT in the classroom. With proper training on how to implement ICT, teachers can offer crucial advice on how to select, integrate and evaluate computer tools to support teaching and learning as they are the backbone in any curriculum innovation for students (Clark, 2000).

The success of integrating ICT into teaching and learning depends on how teachers have been prepared to use computers in teaching (Wernet, Olliges & Delicath, 2017). Since teachers are the backbone in curriculum implementation and integrating of ICT in schools, they should be trained properly in the use in their teaching and learning. When properly trained, teachers' ability to select, integrate and evaluate computer tools to support teaching and learning will improve. However, training of teachers on adoption and use of ICT in most of the developing countries has not been appropriate due to some of the challenges faced (Makhanu, 2010).

For instance, in one study it was observed that the curricula used for training in most cases are oriented towards teaching technical aspects of technology ignoring organizational and social aspects of ICT (Manduku, 2012). According to Manduku (2012), training of teachers should therefore, focus on the ICT pedagogical issues of ICT utilization in the classroom situation and not just on ICT skills. University education can provide teachers with adequate opportunities to experiment with ICT before using it to teach students. According to Becta (2004), lack of ICT concentration in initial training is a barrier to teachers' use of ICT in integrating it in the subject matter. Therefore, where

there is no effective training on ICT, teachers will not be able to use ICT resources for integration purposes.

Becta (2004) also stated that teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of students who perhaps know more than they do. Effective integration will depend to a larger extent on trained and supported teachers (UNESCO, 2003). The greatest challenge of the schools therefore has been the provision of adequate support to teachers in as far as acquisition of appropriate technical skills important for integrating ICT in the classroom instruction is concerned. It has therefore not been established whether university education influences integration of ICT in teaching and this study intends to fill this gap.

2.4 Teachers' Lesson Workload and Integration of ICT

According to Harold (2014), workload refers to all activities that involved teachers' time either directly or indirectly with professional duties, responsibilities and interests. In a similar vein, Shukri (2015) referred to workload as the responsibilities assigned to teachers whether in the classrooms or out of the classrooms. Workload also refers to the total time a teacher teaches in class, the time allocated to accomplish the school work or official duties as a teacher in school and also after school hours.

In a similar vein, Azita (2012) argued that workload also refers to the total time a teacher teaches in class, the time allocated to accomplish the school work or official duties as a teacher in school and also after school hours. Workload is also a form of responsibilities expected to be performed by teachers although not favorable. These responsibilities include teaching and learning, co-curricular activities, file management, meetings and anything related to the official duties as a teacher (Azita, 2012). Workload can be expressed as the amount of work that should be done at a certain time with a

certain quality (Sağlamarı & Çınabal, 2008). Workload is also a form of responsibilities expected to be performed by teachers although not favorable.

Teachers' perception of their workload has a major effect on their well-being and success. Indeed, excessive workload has been associated with many problems such as decreased performance and motivation to study, burnout, anxiety, and depression (Bachman & Bachman, 2016; Jacobs & Dodd, 2013). Workload will affect morale, job satisfaction and the quality of one's personal life (Bachman & Bachman, 2016). According to Gilbeth (2002) and Lukman (2008), one of the causes of occupational stress among teachers is the heavy workload. Teachers who are under pressure score low in terms of quality of work, dedication, motivation, creativity, commitment to tasks, skills and moral ethics. All these will affect school excellence and effectiveness (Azman, 2016).

As for workload perception, it is relative which may vary in accordance with the circumstances that the teacher has been experiencing. The concept workload is the perception that the work loaded above normal to the individual in the workplace. For most of the job, if the natural load of the work has not been calculated mathematically, it is possible to state that this concept has an abstract content based on the perception (Keser, 2016).

Studies have revealed that lesson workloads of teachers influence their acceptance of technology in teaching (Buabeng-Andoh, 2012; Kariuki, 2012; Makhanu, 2010). This view was supported by Ely (1999), who revealed that integrating ICT in the classroom is likely to fail due to lack of time for teachers to prepare teaching materials due to loaded curriculum. Teachers felt that infusing ICT in teaching is an added load and there is no motivation involved in using it for teaching (Bakr, 2011). According to Bakr (2011), for ICT to be integrated in the teaching process, it does not necessarily have

to be part of the curriculum but rather act as a tool to help in the teaching process. Ely (1999) also added that converting manual teaching notes to ICT requires both time and skill on the part of the teachers.

According to a study by Guha (2010), teachers' lesson or workload and time management was a hindrance to the implementation of ICT in teaching. Another research was carried out in Malaysia. That research was carried out in Malaysian Smart schools in 2010 indicates that many teachers felt time was an important factor in ICT integration. The problem of lack for time exists for teachers in many aspects of their works as it affects their ability to complete tasks (BECTA, 2004).

An increase in the workload of the teacher results in a decrease in work satisfaction. And any decrease in work satisfaction of teachers is generally considered to be related to problems such as uneasiness, tension, anger, depression and fatigue (Beehr & Newman, 2008; Dua, 2016). These problems are reflected in work performance, they are revealed in behaviors such as working less efficiently (lower productivity) a lowering of concentration, an increase in making errors, conflicts between individuals, displays of insensitivity, taking too many health reports and being late for classroom duties (Matrunola, 2016).

The time factor could be divided into teachers' free time, time to prepare lesson and time for teaching. Teachers felt that free time is too short to use ICT to integrate it into the lesson, time to prepare for the lesson should be catered for and the teaching time was inadequate if one was to integrate ICT in the lesson (Dua, 2016). According to Dua (2016), the higher the number of lessons allocated to the teacher per week, the less the number of free lessons resulting in workload. Understaffing in schools leads to high lesson workload for teachers and as a result they will get less free time for lesson preparation (Makhanu, 2010).

The number of periods taught by one teacher per week, internal tests, exercises' given, marking load, administrative roles as well as non-administrative roles performed by teachers affects teachers' workload and performance in schools (Mosha, 2014; Gwambombo, 2013). According to Gwambombo (2013), the administrative roles performed by teachers in school includes; head of school(head master/mistress), head of department, second master/mistresses, discipline masters/mistress, academic masters and member of school board. Non administrative roles include; store keeper, cashier, patron and matron, laboratory technicians, librarian, councilors, school driver, subject club master, class teacher, teacher on duty, social affairs coordinator and student's project supervisor (Mbunda, 2016). All these affect teachers' workload and performance. Teachers who are exhausted, frazzled and demoralized by heavy workload are not effective and creative in the classroom hence teaching and learning processes are affected (Mosha, 2014).

In basic schools when teachers are working above their normal working load, it is regarded as heavy workload (Gwambombo, 2013). According to Gwambombo (2013), teachers who are faced with excessive workload are not effective and efficient in the classroom. Teachers' heavy workload can be contributed by the following; handling large class size, teaching many periods, shortage of teachers in schools, lack of teaching staff, lack of teaching facilities and aids and conducting tests in overcrowded classes (Keser, 2016). Furthermore, heavy teachers' workload can bring the following negative effect to teachers; stress, burnout, mistakes in work, poor work-life balance, physical affects and mental effects (Mosha, Omari & Katabaro, 2007).

2.5 Conceptual framework

In this study, the researcher identified a number of factors that influence integration of ICTs into teaching. In the study, the relationship between the independent variables and the dependent variables and how independent variables influenced the dependent variables was explored. The independent variables in the study were teachers' attitudes, teacher training and teachers' lesson workload. The dependent variable for the study was ICT integration in teaching. Each of these variables had its indicators as shown in Figure 2.2.

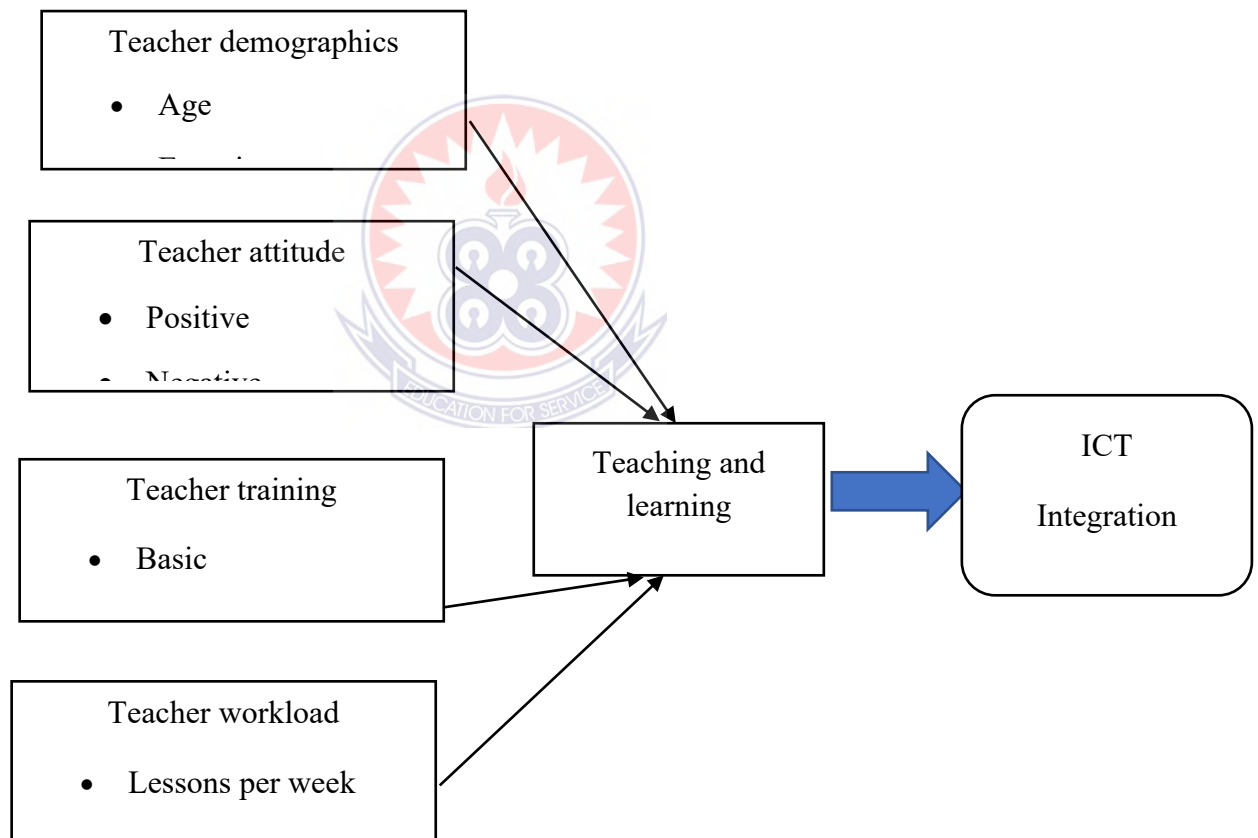


Figure 2.2: Conceptual framework on factors that influence integration of ICT into teaching

2.6 Chapter Summary

From the literature review, there are a number of factors influencing the integration of ICT in the teaching. Such factors include: teacher training, teachers' workload and teachers' attitudes influencing integration of ICT in the classroom. There is a unique difference on the previous studies which were done on ICT as compared to the present study. Time and place of the study is one of the factors that bring about the difference. ICT is changing very fast and conducting a similar study would yield totally different results. Some literature suggests that lack of adequate training and experience is one of the main factors why teachers do not integrate ICT in their teaching. This also results in teachers' negative attitude towards integrating ICT in their lesson delivery. The current study on the other hand, will examine the factors influencing the integration of ICT in teaching at the secondary school level.



CHAPTER THREE

METHODOLOGY

3.0 Overview

The purpose of this study is to assess the integration of information and communication technology in teaching. This chapter covers the research design, population, sample and sampling procedure, instrumentations, data collection and data analysis.

3.1 Study Approach

The research approach is the research philosophy, research paradigm or analytical procedure that underscores the investigation. The research paradigm or approach involves the worldview of a whole framework of beliefs, values and methods within which research takes place. According to Neuman, (2013), there is no one best approach to examine management research rather the approach that is the most effective for resolution of a given problem focuses on a large number of factors. The suitability of a research approach depends on the ideas which emphasise the study, the nature of the study problem and the information gathering procedure (Anlo, 2012; Cooper & Schindler, 2011). As identified by Creswell (2014), there are three basic types of research approaches, namely, quantitative, qualitative and mixed approach.

A research approach that fits for a given study may not be suitable for another study (Boohene, 2006; Creswell, 2009). Although, it is still at the discretion of the researchers to choose a particular research approach, it is suggested that the choice of the research approach should depend on the nature of the study, the data needs and the nature of the analyses required (Boohene, 2006; Zikmund, Babin, Carr, & Griffin, 2013). Following these literatures, the study employs a quantitative approach. The quantitative approach

involves numerical-based data collection where the information collected can be quantified and rigorously subjected to higher-order statistical analysis to support or to refute alternative knowledge claims. This property of the quantitative approach is relevant to the present study as the all the objectives of the study requires numerical data. Again, research approach deals with cause and effect thinking, reduction to specific variables and hypothesis and questions, use of measurement and observation and test of theories), employs strategic enquiry (Creswell, 2014; Zikmund, et al, 2013). Also, the quantitative approach serves as one of the best approaches that help the researcher to test pre-determined hypotheses and produce generalisable results.

The variables in the objectives require numerical measurement, making the quantitative approach the core approach in this study. The quantitative approach is the core because given the purpose of this study, the numerical analyses required to test the hypotheses, and interactions required between the study variables under investigation as well as the testable hypotheses developed. These facets of the study make the quantitative approach the most appropriate and suitable for this study. This choice would aid the study to draw inferences and conclusions that exist in the relationships between and among the study variables under consideration.

The study applied the quantitative approach by following testable hypotheses and theories which provide the bases for generalisation of results. It is also applied by requiring standardised numerical analysis and test of hypotheses to answer research questions and address research objectives. The study further applies the approach by collecting the numerical data to measure the study variables in quantitative terms. The quantitative approach generates numerical data which often seek to determine the relationship between the variables, which are the independent variable and dependent variable (Crotty, 2004).

3.2 Research Design

Descriptive survey design was employed in this study. Descriptive survey design according to Amedahe and Gyimah (2003) makes use of various data collection techniques involving questionnaire. Considering the nature of the research problem and purpose of this study, the most appropriate research methodology that was used is the descriptive survey design.

Descriptive research is generally concerned with the present status of a phenomenon. According to Gay (1992), descriptive research is concerned with the conditions or relationships that exist, such as determining the nature of prevailing conditions, practices and attitudes; opinions that are held; processes that are going on; or trends that are developed. The purpose of descriptive research is to observe, describe and document situation as it naturally occurs.

According to Kombo and Tromp (2006), a research design is the arrangement of conditions for collection and analysis of data in a way that aims at minimizing expenditure of efforts, time and money. A descriptive survey design was chosen for this study because it is not possible to manipulate the variables of the study like sex, teaching experience, academic qualification, teaching workload and knowledge in ICT.

The descriptive sample survey answers questions of what, where, when and how and has the advantage of eliciting responses from a wide range of people (Teye, 2012). It is chosen because in considering the purpose of the study it is the most appropriate design which leads the researcher to make a meaningful conclusion from the study. In addition, the study attempted to look into those factors that already had an influence on ICT integration in teaching. These factors included teacher demographics, teacher attitudes, teacher training and teaching workload.

3.3 Population

According to Cohen, Manion and Morrison (2007) population is a group of elements or variables, humans, objects or even which form specific criteria that are interested to the researchers for generalization of results. In a similar vein, Ary, Jacobs and Razavieh (1990) defined population as all members of a defined category of elements such as people, events or individual items of interest under consideration. Population is also referred to as “the total number of subjects of your research that conform to a clearly defined set of characteristics” (Awanta & Asiedi-Addo, 2008, p. 55). The population for the study was senior high teachers within the Awutu Senya West District. The total population for the study comprised all One hundred, and ten (110) teachers in the school. These were individual teachers who played critical roles in using ICT in their teaching and learning processes.

3.4 Sample and Sampling Procedure

Varkevisser (2003) explains sampling as the process of selecting a number of study units from a defined population. Similarly, Awanta and Asiedu-Addo (2008) define sampling as a procedure of selecting a part of a population on which a research or study can be conducted. Also, Leady (1993) defines sampling as the process of choosing from a much larger population, so that selected parts represent the total group. Sampling is not a technique or procedure for getting information but it ensures that any technique used helps in getting information from a smaller group, which accurately represents the entire group (Teye, 2012). This establishes the fact that samples from the study population are taken when it is not feasible to carry out whole population studies. These samples are normally supposed to be selected in such a way that conclusions drawn from the study can be generalized for the entire population.

The sampling procedure employed for the study was the simple random sampling. Simple random sampling, according to Teddie and Tashakkori (2003), involves randomly selecting members or cases of the population. In a similar vein, Schellenberg, Abdulla and Nathan (2001), defined random as an attempt to gather information about members of the same group which has similar characteristics, called. One of the greatest advantages of a random survey is that all respondents have the same opportunity to participate. Some respondents may still choose not to participate, but at least the opportunity to do so is presented. No one person or group can feel slighted or left out. The technique affords easy responses from the respondents. The researcher chose this sampling method because the cases were available and easy to study to get the expected responses (Gall, Borg & Gall, 2006). In all, 110 teachers were census selected for the study.

3.5 Instrumentation

Questionnaire was used as research instrument to collect data for the study. Questionnaire was used because it allows for simplicity, easiness and quickness of responses (Amin, 2005; Sarantakos, 2008). The questionnaire was made up of four sections: A, B, C, and D. Section 'A' dealt with the respondents' demographic information. Items considered were age, gender, highest level of education, rank and teaching experiences. Each of the other three sections collected information on the factors influencing teachers' integration of ICT in relation to teachers' demographics, teachers' attitudes, teacher training, teaching workload and integration of ICT in teaching.

3.6 Validity and Reliability of the Instruments

The quality of a research instrument or a scientific measurement is determined by both its validity and reliability (Aikenhead, 2005). Validity seeks to determine whether the instrument actually measures what is intended to be measured but reliability on the other hand refers to the gathering of multiple measurements (Gott, 2003).. The questionnaires were pilot-tested at Apam Senior High School that have not been selected for this study. Apame Senior High School was chosen because it has some attributes similar to the accessible population of the study. The result was analyzed afterwards to determine the content validity of the instrument and those items that needed revision.

The pilot-testing is important in that it served the purpose of enhancing the content validity and reliability of the instrument and also to improve the question format and the scales. The basis of the validity of a questionnaire is to ensure that the right questions are asked without creating any ambiguity. A drafted copy of the questionnaire was made available to my supervisor for face to face discussion and content validity. A careful analysis of the items was done based on the comments passed by respondents concerning the weakness, clarity and ambiguity in all aspects of the questionnaires. The reliability co-efficient value from the SPSS was 0.76, which was considered as reliable.

3.7 Data Collection Procedure

Before contacting the school and their respective teachers, permission was sought from the head masters of the various schools. This enabled planning to determine the suitable time and day to administer the final questionnaire.

The instruments were hand delivered to all the participants of the study. To ensure the anonymity of the teachers, no identification was required from the respondents in responding to the research items in the open-ended and close-ended

questions. The instruments were hand delivered to all the participants of the study. The data collection was completed within two weeks from the day participants received the questionnaire.

3.8 Ethical Considerations

Ethics refers to doing what is morally and legally right in conducting research (Lerner, 2010). Research ethical consideration is important and researchers should protect the dignity of their subjects and publish well the information that is researched (Fouka & Mantzourou, 2011). Some of the ethical issues requiring consideration were the length of time the questionnaire took, statement indicating what would happen to the information collected and statement about confidentiality and anonymity. The participants were assured that the data would be used for academic purposes only.

Furthermore, confirmation that participants had no obligation to take part and that participants had the right to withdraw from the study or not to answer any particular question. The researcher got ethical clearance from University of Cape Coast to conduct the study and adhered to the ethical principles of the University of Cape Coast. The researcher also acknowledged all scholarly works and information consulted from journal articles, books, dissertation, theses and data from the field.

3.9 Data Analysis

Data analysis helps to manipulate the data obtained during the study in order to assess and evaluate the findings and arrive at some valid, reasonable, and relevant conclusions (Aikenhead, 2005). SPSS version 21.0 was the software used for the analysis. The entire questionnaire was coded with the help of SPSS for the quantitative data. All respondents were given serial numbers to facilitate coding and analysis.

Frequency tables, means, standard deviation, pie charts and bar charts were also used in presenting the data. Pearson coefficient correlation was used in testing the hypothesis.

3.10 Chapter Summary

This chapter described the methodology and procedures that were used to collect the data from the respondents in the study. The descriptive research design was used to allow the researcher to interpret the results in different ways. The population, the sample and sampling procedures, the research instruments as well as the data collection procedures and the data analysis procedures were also described in this chapter. The chapter further discussed the ethics considered in ensuring the humane treatment of the participant in the research.



CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

This chapter deals with the data presentation and analysis. All data gathered for the study are organised, analysed and this is followed by discussion of key issues relating to the findings of the study. Some of the demographic variables are presented in charts. Frequency tables are provided to give statistical reflections on key issues in terms of the research questions.

4.1 Demographic Characteristics of the Respondents

The demographic characteristics considered in the study are age, sex, highest educational level and years of teaching experience. The demographic characteristics of the respondents helped in determining the extent to which the responses they provided could be depended upon. Out of 110 teachers sampled for the study, 100 (90.9%) valid questionnaire was retrieved.

4.1.1 Age Distribution of the Respondents

It was necessary to determine the ages of the teachers since this information would help to know how young or mature the respondents are. Figure 3 indicates that 7% of them fell under the 25 age bracket. Twenty-one percent and 15.0% fell in the 26 – 30 and 31 – 35 age brackets respectively. Seventeen percent and 24% of them respectively fell in the 36 – 40 and 41 – 45 age brackets. Another 5% of them fell in the 46 – 50 age brackets while 10% of them fell in 51 – 55 age brackets. The remaining 1% fell in the 56 – 60 age brackets. The details are provided in figure 2.

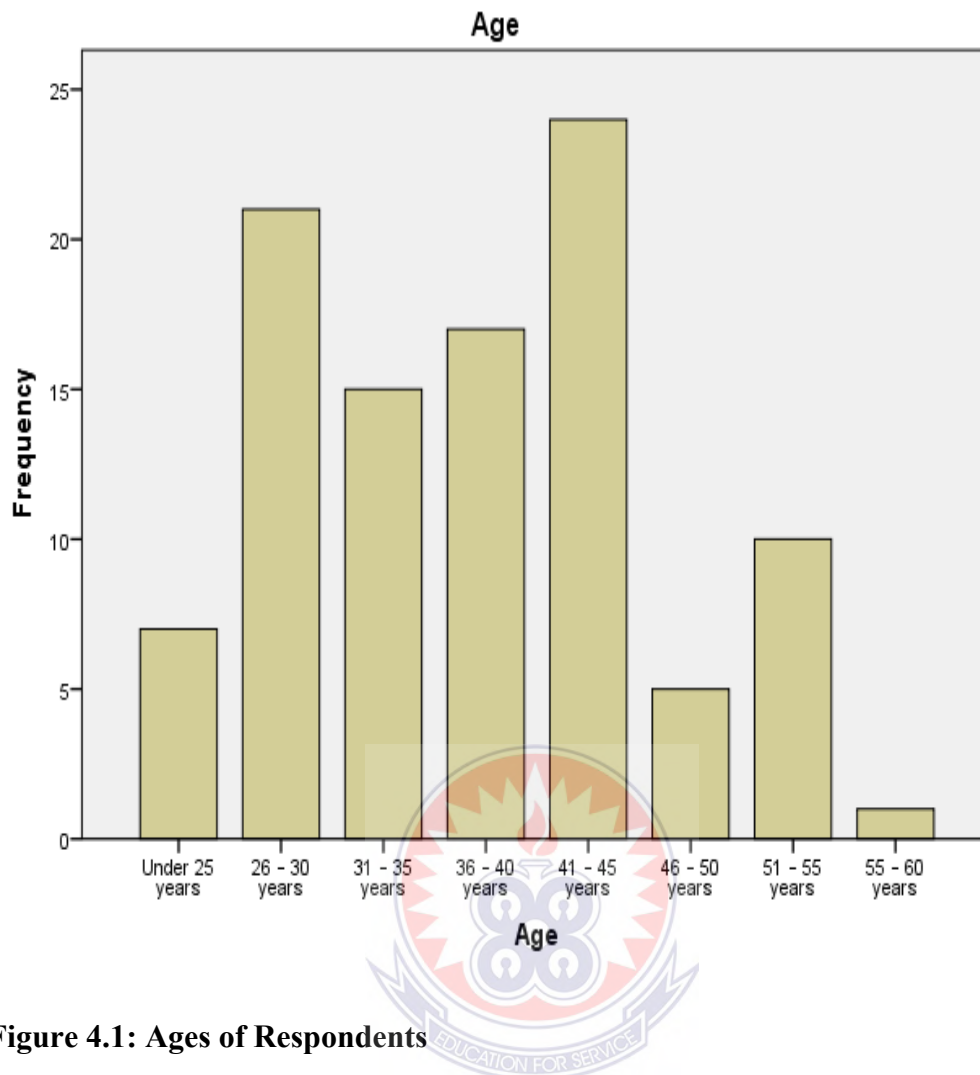


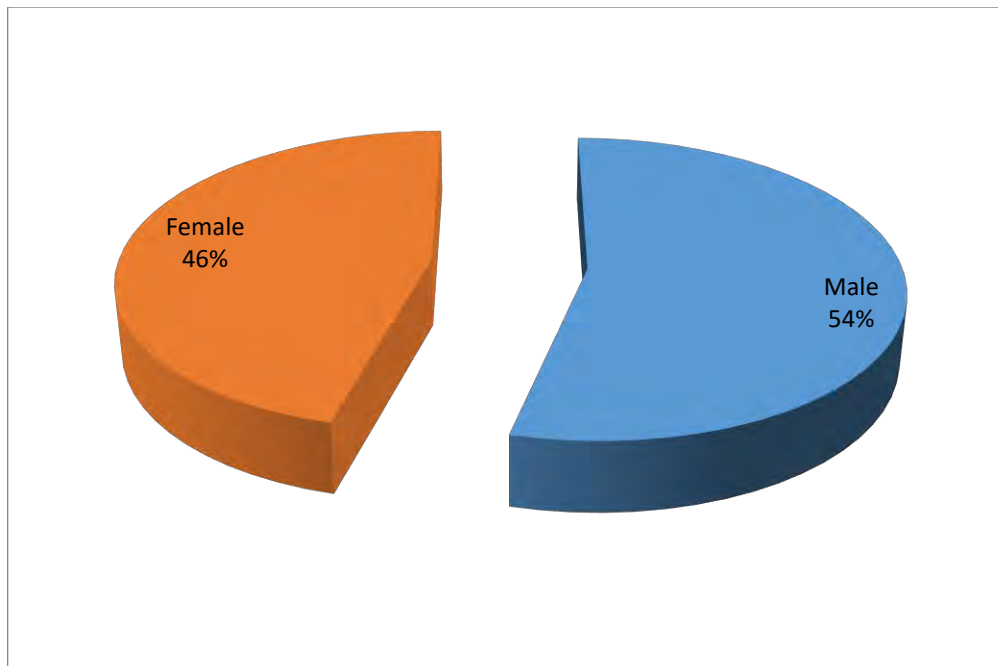
Figure 4.1: Ages of Respondents

Source: Field survey, (2020).

The results of this analysis shows that the teachers used for the study spread across all categories of age group, that is young, middle age and those preparing to retire from active teaching service. They therefore cater for all the age interest needed for this study.

4.1.2 Gender of Respondents

Out of the 110 teachers selected for the study, 54.0% were males and 46.0% were females. This suggests that most of the teachers used in the study were males. The details are provided in Figure 3.



Source: Field survey, (2020).

Figure 4.2: Respondents based on gender

Most studies allege that teaching in the senior high school is a male dominated area while others think otherwise. For instance, some research studies revealed that there are more male teachers teaching at the senior high schools than their female counterparts (Kay, 2006; Yusuf, 2012). However, in Western US schools Breisser (2006) found that female teachers were more than male teachers. Even though this was not the focus of the research, males were in a greater proportion compared to females at Kumasi Girls Senior High School.

4.1.3 Highest Educational level of Respondents

The data reveals that as many as 78.0% of the respondents possessed First Degree certificate as their highest level of education whilst 22.0% possessed a Master's degree. The details are provided in Table 1.

Table 1: Educational level of the Teachers

Educational level	Frequency	Percent
First Degree	78	78.0
Master's degree	22	22.0
Total	100	100

Source: Field survey, (2020).

A deduction from the above is that majority of the respondents are first degree holders. This shows that for someone to teach as a teacher at the senior high school level, they should possess at least a first degree.

4.1.4 Teaching Experience of the Respondents

As shown in Table 2, most of the teachers (33.0%) had only up five years of teaching experience. Indeed, 56% of them had 10 or less years' experience in teaching with only 24% with more than 15 years of teaching experience. The details are represented in Table 2.

Table 2: Teaching Experience of the Respondents

Age	Frequency	Percent
1 – 5 years	33	33.0
6 – 10 years	23	23.0
11 – 15 years	24	24.0
16 – 20 years	16	16.0
Above 30 years	4	4.0
Total	100	100

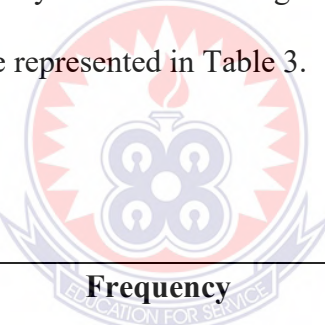
Source: Field survey, (2020).

An inference from the above is that majority of the respondents have spent more than five years as teachers. The fact that more than 67% of the teachers had more than five years of working experience as teachers is encouraging. It can imply that the selected teachers might have experience in using different strategies in their teaching deliveries. Experience might not necessarily be the best, but it almost always results in the most enduring lessons.

4.1.5 Current Rank of the Respondents

With regards to the current rank of the teachers, Table 3 shows that 40% were within the rank of Principal Superintendent. Again, 32.7% and 20% of the respondents were ADII and ADI respectively and the remaining 7.3% was for Deputy Directors. The details of their responses were represented in Table 3.

Table 3: Rank of Teachers



Rank	Frequency	Percent
Principal Superintendent	44	40.0
AD II	36	32.7
AD I	22	20.0
Deputy Director	08	07.3
Total	110	100

Source: Field survey, (2020).

4.2 The extent to which teachers' attitude influence the integration of ICT in teaching

This question sought to establish how teachers attitude influence the integration of ICT in teaching. Some indicators of attitudes were used to collect data. The analysis of the data is presented in Table 4.

Table 4: Teachers' Attitude towards the Integration of ICT in Teaching

ITEM	SA	A	SD	D	M	SD
ICT tools are difficult to use	36 37%	44 45%	11 11%	7 7%	1.93	.940
I feel comfortable using ICT tools in teaching	34 35%	37 38%	12 12%	14 15%	2.04	.999
I believe that I could be a better teacher with ICT tool	39 40%	29 30%	17 18%	12 12%	2.23	.981
I don't think I can use ICT tools in my teaching	21 23%	9 10%	47 50%	16 17%	1.86	.794
Students performance can improve if I use ICT tools	54 61%	2 2%	20 23%	12 14%	2.36	.665
I think teaching would be enjoyable and stimulating if I use ICT tools	43 44%	12 12%	16 16%	28 28%	2.50	1.01
ICT tools are very relevant in teaching	10 10%	15 16%	43 43%	30 31%	2.87	1.03
I don't feel threatened with the use of ICT tools in teaching	33 34%	8 8%	26 27%	30 31%	2.77	.964
ICT makes preparing lessons quicker	37 38%	21 22%	19 20%	19 20%	2.78	1.13
Total Mean					21.2	8.38
Mean of Means/Std. Deviation					2.35	.93

The mean scores were interpreted as follows:

1 – 2.0 = Low; 2.1 – 3.0 = Moderate; 3.1 – 4.0 = Good

Source: Field survey, (2020).

Most teachers (45%) agreed that ICT tools are difficult to use. About 38% of the teachers are comfortable using ICT tools in teaching. Approximately, 40% of the teachers strongly believe that they could be better teachers when they use ICT tool in their lesson delivery. Again, 50% of the teachers agreed that they can use ICT tools in their teaching. Similarly, 61% of the teachers strongly agreed that students' performance can improve if ICT tools are used in teaching and 44% suggested that teaching would be enjoyable and stimulating if ICT tools are used. Furthermore, 34% strongly agreed that they don't feel threatened with the use of ICT tools in teaching and 38% strongly agreed that ICT makes preparing lessons quicker.

The extent of teachers' attitude influence the integration of ICT in teaching was also measured using four Likert-scale items (see Table 4). From the mean values, it could be observed that some of the measured factors are higher while others are low (using a measuring likert scale of 1-4) Higher scores on this factor show more teachers attitude influence the integration of ICT in teaching.

Furtherance to the forgoing descriptive statistics, the study sought examine the extent to which teachers attitude influenced the integration of ICT. From Table 4, it could be observed that teacher's attitude and ICT integration have been captured with series of constructs on a likert scale. five of the constructs relates to teachers' attitude while the remaining five relative to ICT integration. To examine the extent of influence, teachers attitude which is the independent variable is regressed on ICT integration which is the dependent variable.

Estimation of teachers' attitude towards ICT integration (regression analysis)

	Beta	t-stat	Sig.	R²	f-stat
Model				0.760	11.255 (.001)
IT	0.481	4.475	0.000		

IT connotes ICT integration

The first of the statistics are the R² and the f-statistics. These are used to assess the fitness of the model. It could be observed from the table that R² for IT model is 0.760. This means that the various constructs used for teachers' attitude are capable of explaining about 76% of variations in the level of ICT integration. This is higher indicating that teacher attitude constructs used are critical in modeling ICT integration in the school.

The statistics reports the coefficient or beta (β). The result indicates a positive coefficient of $\beta = 0.481$ and a sig value of $p = 0.000$. The implication of the significance value and the positive coefficient is that teacher attitude has a positive significant influence ICT integration. Therefore, teachers should be stimulated through proper training and provision of the required tools in order to help them to continuously develop positive attitude for effective integration of ICT

The study supports the findings of Hew and Brush (2017) and Keengwe and Onchwam (2018) who revealed that teachers have a positive attitude towards integration of ICT into classroom. Studies conducted by Dyck and Smither (2005) and Teo (2008) also reveal that teacher's attitude is positive towards ICT and will influence them to integrate it in their teaching.

4.3 The extent of Senior High School teachers' training influences the integration of ICT in teaching

The question sought to get information on whether the secondary teachers had received any training on how to integrate ICT in their teaching process and the effect the training or lack of training had on ICT integration.

In trying to answer the research question, the teachers were asked whether they have received any form of ICT training. The details of their responses are presented in Table 5.

Table 5: Respondents' View on Receiving Training on ICT

Response	Frequency	Percent
To a large extent	77	79.4
To some extent	20	20.6
Total	97	100

Source: Field survey, (2020).

The data in Table 5 reveals that as many as 77 (79.4%) of the teachers claimed to a large extent they have received training on ICT before. The remaining 20 (20.6%) responded in the negative. A deduction from the above is that the majority of the teachers have received training on ICT before. This outcome supports the study by Yu (2012), who concluded that most teaching staff have received training in ICT before. The outcome of this study disagree with the study done by BECTA (2004), who concluded that most teachers did not have the privileges to be trained on ICT skills. This implies that since most of the teachers used in the study to a large extent have received training on ICT before and it will influence their decision to integrate them in their teaching. The outcome of this study support the view of Manduka (2012), who concluded that training received by teachers' influences their decision in integrating ICT in their teaching.

The teachers were further asked to indicate the areas they received the training in and the details are provided in Table 6.

Table 6: Teachers' Responses on Areas they Received ICT Training

Areas in training	Frequency	Percent
Computer skills	12	15.7
ICT integration skills	39	50.6
Software and hardware	9	11.7
ICT in education pedagogy	17	22.0
Total	77	100

Source: Field survey, (2020).

The data in Table 6 shows that 12 (15.7%) of the teachers received computer skills training, 39 (50.6%) received ICT integration skills and 9 (11.7%) received training on software and hardware. The remaining 17 (22.0%) of the teachers received training on ICT in education pedagogy. It can be concluded that the extent of training received by the teachers will influence them to integrate ICT in their teaching.

4.4 The extent of Senior High School teachers' workloads influencing the integration of ICT in teaching

The study sought to find out the number of lessons taught by the teachers in a week. This was to determine whether they had a heavy teaching workload or they had adequate time to plan for ICT related content. The results are as shown in Table 7.

Table 7: Hours Teachers Teach Per Week

Lessons Per Week	Frequency	Percent
14	12	12.4
16	26	26.8
20	25	25.8
24	34	35.0
Total	97	100

Source: Field survey, (2020).

The results in Table 7 revealed that 12 (12.4%) of the teachers accumulated 14 hours or lessons per week, 26 (26.8%) teach 16 hours per week and 25 (25.8%) teach 20 hours per week. The remaining 34 (35.0%) of the teachers teach accumulated 24 hours or lessons per week. It can be concluded that majority of the senior high school teach accumulated 24 hours per week.

The teachers were asked to indicate often they prepare and present their lessons in class using ICT tools. The details of their responses are represented in Table 8.

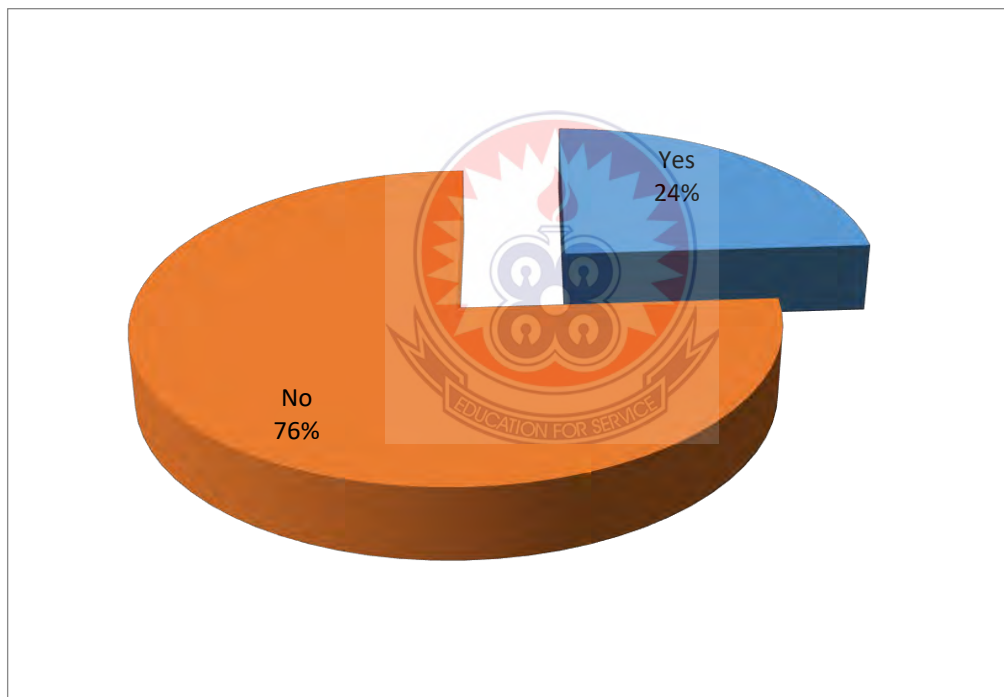
Table 8: How often Teachers Prepare their Lessons Using ICT Tools

Rate at which teachers prepare for lessons using ICT tools	Frequency	Percent
Very often	11	11.2
Often	14	14.3
Occasionally	46	46.9
Rarely	23	23.5
Never	4	4.1
Total	98	100

Source: Field survey, (2020).

The findings in Table 8 revealed that 11 (11.2%) of the teachers very often prepare their lessons using ICT tools, 14 (14.3%) of them often prepare lessons using ICT tools and 46 (46.9%) of them occasionally prepare lessons using ICT tools. Similarly, 23 (23.5%) of the teachers rarely prepare lessons using ICT tools and the remaining 4 (4.1%) of the teachers never prepare lessons using ICT tools. It can be concluded that majority of the senior high school teachers occasionally prepare lessons using ICT tools.

The teachers were further asked to if they get time to prepare for their teaching using ICT tools or not. Their responses are presented in figure 4.



Source: Field survey, (2020).

Figure 4.4: Respondents view on whether they have time to prepare for their teaching using ICT tools

Figure 4.3 shows that as many as 76 (76.0%) of the teachers responded in the negative that they do not have time to prepare for their teaching using ICT tools. The remaining 24 (24.0%) responded in the affirmative. A deduction from the above is that,

majority of the teachers do not have time to prepare for their teaching using ICT tools. It therefore means that most of the teachers rarely prepare lessons using ICT tools because they do not have time to use them in their teaching delivery. This support Buabeng-Andoh (2012), Kariuku (2012) and Makhanu (2010) findings that workload of teachers influence their acceptance of technology in teaching.

4.4.1 Testing of Hypotheses

H₀₁: The attitude of teachers towards ICT adoption has no statistically significant effect on their training received on ICT.

The results of the Pearson Correlation analysis for the mean attitude and overall effect of training on ICT are reflected in Table 9.

Table 9: Pearson Correlation (Mean Attitude and Overall Effect of Training)

Correlations		Overall Training Received	Mean Attitude
Overall Training Received on ICT	Pearson Correlation	1	.050
	Sig. (2-tailed)		0.35
	N	100	100
Mean Attitude	Pearson Correlation	.050	1
	Sig. (2-tailed)	0.35	
	N	100	100

Significant at the $P = \leq 0.05$ levels

Source: Field survey, (2020).

The results in Table 9 revealed that there is no significant correlation between the mean attitude of teachers' towards the adoption of ICT and training received on ICT. as can be observed from the results on all the items ($r = .050$, $p = .0.35$). It is also not significant because there is a weak correlation between the overall effect of training and the mean attitude of teachers towards ICT adoption. Statistically, it did not prove to be significant, therefore the null hypothesis is accepted. This could be attributed to fact that

the selected school did not have the needed facility for training of teachers to support the teaching of ICT. This result supports the findings of Blazar (2017) and Rahman (2011), who found that there is no significant difference between the level of training received on ICT among teachers and their attitude towards ICT adoption. However, this study contradicts the work of Kpolovie and Awusaku (2016), who revealed that there is a significant difference between the attitude and level of competency of lecturers towards ICT adoption.

H₀₂: There is no statistically significant difference between the integration of ICT tools in teaching between male and female teachers.

The results of the Independent t-test analysis are presented in Table 10.

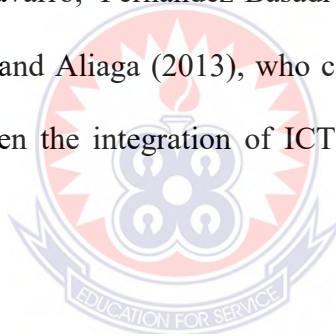
Table 10: Mean and Standard Deviation of Male and Female Teachers

Variables	Male		Female		t value	P value
	M	SD	M	SD		
ICT tools are difficult to use	2.83	1.04	2.36	1.08	2.74	.656
I feel comfortable using ICT tools	3.15	1.06	3.08	1.04	.408	.822
I believe that I could be a better teacher with ICT tool	2.08	.99	2.07	1.00	-.21	.829
I don't think I can use ICT tools in my teaching	2.80	.992	2.91	1.01	.67	.501
Students performance can improve if I use ICT tools	2.60	1.06	2.71	1.01	-.615	.540
I think teaching would be enjoyable and stimulating if I use ICT tools	2.70	.843	2.84	1.00	-.90	.367
ICT tools are relevant in teaching	2.96	.927	2.78	.937	1.18	.240
I don't feel threatened with the use of ICT tools in teaching	2.12	.958	2.13	1.20	-.060	0.44
ICT makes preparing lessons quicker	2.80	.980	2.85	.911	-.338	.736
Overall Attitude level	2.83	1.04	2.36	1.08	.180	.857

Significant at the $P \leq 0.05$ level

Source: Field survey, (2020).

Table 10 indicates that the difference between the integration of ICT in teaching by male and female teachers was not statistically significant (t value = .180, P = .857). By the results, the study accepts the null hypothesis that there is no statistically significant difference between the integration of ICT in teaching by male and female teachers. This could be attributed to the fact that the challenges in integrating ICT in teaching cut across for all teachers but not on gender basis. This may be the reason why there is no significant difference between them. This result supports the findings of Ahiatrogah and Barfi (2016), who concluded that there is no statistically significant difference between the integration of ICT in teaching by male and female teachers. However, this study contradicts Fernández-Batanero, Sañudo, Montenegro-Rueda and García-Martínez (2019), Navarro, Fernández-Basadre and Herrera-Vidal (2015) and Suárez, Almerich, Gargallo and Aliaga (2013), who concluded that there is statistically significant difference between the integration of ICT in teaching by male and female teachers.



4.5 Chapter Summary

This study assessed the integration of information and communication technology in teaching. Specifically, the study revealed that teachers' attitude influence their integration of ICT in teaching. Similarly, most of the teachers used in the study have received training on ICT before and it influences their decision to integrate them in their teaching.

Also, majority of the teachers do not have time to prepare for their teaching using ICT tools because of their workload. Furthermore, there is no statistically significant difference between the integration of ICT in teaching by male and female teachers.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Overview

This chapter presents a summary of the findings, conclusion and outlines recommendations including areas for further research.

5.1 Summary

The study assessed the integration of information and communication technology in teaching. Simple random sampling technique was used to select the senior high schools teachers within the Awutu Senya West district. In all, one hundred and ten teachers were selected for the study. Self-administered questionnaire was used as an instrument for the study. SPSS version 20.0 was the software's used for the data analysis. Frequency tables and pie charts were also used in presenting the data. Conclusions from relevant related literature were captured along to authenticate the findings of the study. The summary of the findings are presented as follows:

The study revealed that most of the teachers' attitude influences their integration of ICT in teaching. This was revealed among other factors through teachers desire to use ICT tools and the frequency with which these tools were used.

Most of the teachers used in the study have received training on ICT before and it influences their decision to integrate them in their teaching.

Majority of the teachers do not have time to prepare for their teaching using ICT tools because of their workload.

5.2 Conclusions

The following conclusions were drawn based on the research questions that were set:

It can be concluded that majority of the teachers attitude influences their integration of ICT in teaching. The results revealed that teachers have received training on ICT before and it influences their decision to integrate them in their teaching. Majority of the teachers do not have time to prepare for their teaching using ICT tools because of their workload. Similarly, there is no significant correlation between the mean attitude of teachers' attitude towards the adoption of ICT and training received on ICT. This could be attributed to fact that the selected school did not have the needed facility for training of teachers to support the teaching of ICT. Furthermore, there is no statistically significant difference between the integration of ICT in teaching by male and female teachers. This could be attributed to the fact that the challenges in integrating ICT in teaching cut across for all teachers but not on gender basis.

5.3 Recommendations

From the summary of the major findings of this study, it is recommended that:

1. Some of the teachers are uncomfortable when it comes to integrating ICT in teaching; it is recommended that such teachers are given training on ICT.
2. Teachers should be provided with broadband internet connection packages at affordable payments and installment conditions. This is because they do not have enough time to prepare for their lessons due to their workload. This arrangement will motivate them to integrate more ICT in their teaching.
3. It is also recommended that more teachers should be employed at the secondary school level, especially those with competency on ICT to reduce teaching

workload. Heavy teaching workload influences the integration of ICT into teaching and learning because teachers do not get adequate time to prepare for lessons. This can be possible when the Government of Ghana allocate more funds to the Ministry of Education to recruit teachers.

5.4 Suggestions for Further Research

It may be necessary for further research to be conducted to determine if the characteristics of teachers like age, academic qualifications and teaching experience are best attitude predictors when it comes to ICT integration in the classroom.



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