UNIVERSITY OF CAPE COAST

CHALLENGES ASSOCIATED WITH THE INTRODUCTION OF
INFORMATION, COMMUNICATION AND TECHNOLOGY
IN SENIOR HIGH SCHOOLS IN THE CAPE COAST METROPOLIS

BEATRICE AMANKWAH YEBOAH

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INFORMATION, COMMUNICATION AND TECHNOLOGY IN
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BY

BEATRICE AMANKWAH YEBOAH

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for award of Master of Education Degree in Information Technology

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DECLARATION

Candidate's Declaration

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

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

Name: Beatrice Amankwah Yeboah

Supervisor's Declaration

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

Supervisor's Signature: …………………….   Date: …………..

Name: Prof. Paul Dela Ahiahogah

ABSTRACT

The purpose of the study was to investigate the challenges associated with the introduction of information and communication technology in senior high schools in the Cape Coast metropolis and to propose strategies aimed at improving ICT usage within the district. Four research questions were formulated to guide the study. Relevant and Related literature was reviewed. A descriptive survey design was employed. Fifty (50) ICT teachers constituted the population of which thirty (30) were randomly sampled.

In order to gather enough data for the study, questionnaire was used. All the items were mainly close-ended items on a likert-type scale and were generated from the research questions. The data gathered with the instrument were analysed and interpreted to provide answers to the research questions by using frequencies and percentages.

From the study, it was revealed that most ICT teachers have at least first degree certificate and also, there should be regular In-service training for teachers who teach ICT by school authorities. It was recommended that, teachers who teach ICT must have the requisite qualification before teaching. The government should also provide proper infrastructure for the learning of ICT and there should be frequent training for ICT teachers.

ACKNOWLEDGEMENTS

DEDICATION

To my lovely husband, Stephen Amankwah Yeboah and my children,

Nana B. A.Yeboah, Kwabena A. A. Yeboah and Kofi A. Yeboah JNR.

TABLE OF CONTENTS

PAGE

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Background to the Study

Education policymakers in Ghana have hailed the introduction of Information and Communication Technology (ICT) in Ghanaian secondary schools as a remarkable step that would contribute to knowledge production, communication and information sharing among students and teachers in the school system. This move stems from assertions in the literature about the benefits that come with ICT literacy in schools (Mucherah, 2003; Hakkarainen, .,Ilomaki, Lipponen, Muukkonen, & Rahikainen, (2000). Hakkarainen et al (2000) points out that ICT is a transformative tool and its full integration into the school systems is necessary to prepare students for the information society they had inherit.

Contrary to the promising notion of ICT as a means of knowledge production, numerous scholars have highlighted the need to address the numerous problems that the introduction of ICT would bring. These issues include: a lack of adequate planning for implementation of ICT (Mooij & Smeets, 2001); inadequate teacher training , inequalities in ICT distribution (Sutherland-Smith, Snyder & Angus, 2003); lack of information regarding the distribution of ICT; low levels of literacy in general, and lack of relevant content and technology applications to meet the needs of diverse societies (Hakkarainen et al, 2000). The literature identifies the tendency for ICT to lead to a digital divide between urban and rural schools .

A review of the available literature revealed significant inequity in the implementation of ICT in Ghanaian secondary schools. The literature (Dankwa, 1997; Parthemore, 2003) revealed that ICT provision to secondary schools is skewed in favor of schools categorised as premier schools and schools in urban areas. Unfortunately, this is not a new trend. Since the introduction of formal schooling in Ghana, educational resources have been unequally distributed in the school system (Folson, 1995; Graham, 1971; and McWilliam & Kwamena-Poh, 1975;). At this juncture, it is critical that policy makers ensure ICT does not become another tool for perpetuating educational inequalities in Ghana's school system (Mfum-Mensah, 2001)

Farrell (1999) points out that schooling is a long-term process in which children may be sorted at many different points and in several different ways. Thus, schooling operates as a selective social screening mechanism. It enhances the status of some children, providing them with an opportunity for upward social or economic mobility. It also ratified the status of others, reinforcing the propensity for children born poor to remain poor as adults, and for children born into well-off families to become well-off adults. Studies on post colonial education in sub-Saharan Africa revealed that schooling has been a mechanism for perpetuating these/such social inequalities (Farrell, 1999; Mfum- Mensah, 2003; Samoff, 1999).

According to Farrell (1999) the term "equality" refers to equitable service provision as well as the actual patterns in which something (for example. income or year of schooling) is distributed among members of a particular group. When

the concept is applied to public policy, "equality" has to do more specifically with non-discrimination (Samoff, 1999). Farrell conceptualizes "educational equality" as encompassing four dimensions including equalities of access, survival, output and outcome. He defines equality of access as the probabilities of children from different social groups getting into particular levels or portions of the school system. He applies this concept to the inequalities in the distribution of educational resources. He posits that most children residing in remote rural areas, those in urban slums, and those belonging to groups outside of mainstream society are disadvantaged when it comes to the distribution and access to educational resources.

Farrell (1999) defines equality of survival as the probabilities of children from various social groupings staying in the school system to some defined level, usually the end of a complete cycle. He explains that in any given level poor children are generally less likely to survive educationally than a well-to-do children. Similarly, children born in rural areas are less likely to survive educationally than urban children. Equality of output, refers to the probability that children from various social groupings will learn the same things to the same levels at a defined point in the schooling system. The concept is expressed through differences in the level of achievement in nation's school system which Farrell points out as systematically associated with differing social origins. He points out that among those who have reached a given level of nation's school system, children who are poor, rural, female, or from any other socially marginalised groups learn less. Equality of outcome, refers to the probability

3

that children from various social groupings will live relatively similar lives subsequent to and as a result of schooling. Here too, Farrell posits that in societies where the economy is expanding, and where there is no dominant group in the society, formal education becomes a predominant influence on the level of employment acquired. The "equality model" presented above by Farrell shows how formal schooling can be a powerful selective tool for ratifying or building a new social order. The model served as a useful lens that analysed the educational inequalities that have characterised the Ghanaian educational system and can be extended to analyse ICT implementation.

Since the time formal schooling was introduced in Ghana to date, educational provision has been skewed in favor of those in the urban communities and there has been inequitable distribution of educational resources and services (Graham, 1971). Postcolonial educational reforms, policies and practices have done little in terms of bridging the gap that has been created between schools in the urban communities and their counterparts in the rural and isolated communities. Most schools in the urban areas have been in existence since the colonial or early post colonial era (Foster, 1995).

Premier schools such as Achimota, Prempeh College and Wesley Girls, were fashioned along the lines of elite British schools and are well known beyond the borders of Ghana. Most of the rural schools that were established from the 1970s onwards, especially those that proliferated in the 1990s after the implementation of the Senior Secondary School (SSS) concept, are based on the egalitarian ideology of mass secondary schooling (Ministry of Education, 1974 &

1999b). Since their establishment, most of these rural Senior Secondary Schools have faced problems: poor infrastructure, lack of logistical support, inadequate material input, and lack of qualified teachers. In the light of such general inequalities in Ghana's school system, a current challenge is the equitable implementation of ICT policy for secondary schools. This issue becomes intricate when factors such as accessibility of electricity and telephone grids, the current state of school infrastructure, and availability of technical support are considered.

Educational policy makers, non-governmental organisations (NGO), bilateral and multilateral donor organisations, and school administrators are making the collective efforts to promote ICT in Ghanaian secondary schools. Because of the efforts of NGOs and donor organisations in particular, ICT facilities have extended to some schools, mostly in urban communities (Dankwa, 1997; Parthemore, 2003). Parthemore (2003) points out that many secondary schools in Ghana can now boast of computer labs through which students are gaining basic computer literacy. A number of these schools have Internet capabilities, enabling students to deepen their connection to the outside world. Although this is encouraging information, extensive review of documents of NGOs that are spearheading ICT implementation in Ghanaian schools reveals that most secondary schools now benefiting from ICT are either located in urban areas or are classified as premier secondary schools (Dankwa, 1997; Hawkins, 2002; Parthemore, 2003).

According to Parthemore (2003), computer literacy education in Ghana has been concentrated in major urban areas. A few better schools in outlying

5

areas have attempted to "catch up" with their urban counterparts by contracting with private companies to provide computer education. The costs for private computer training are prohibitive and it is rarely if ever the case that all students have access. Other schools have taken part in the Ghana Education Service sponsored scheme where for every hundred textbooks they purchase from a private firm, they receive one computer system.

Statement of the Problem

The Ghana government has seen the role ICT plays locally and internationally in the various programmes being run at the secondary schools in the 2007/2008 academic year. It has therefore decided to equip every secondary school leaver with the required skills and knowledge to cope with the ever changing time. However, Computers which should be on one-on-one basis are normally not so. Most ICT teachers do not have the required skills, knowledge and expertise to teach the subject at the senior high level. In view of this, the researcher found it important to conduct a study on the challenges associated with the introduction of ICT in senior high schools in the Cape Coast metropolis of Ghana.

Purpose of the Study

The study aims at investigating the major challenges associated with the introduction of Information Communication and Technology (ICT) in the senior high school curriculum. My study sought to find out the challenges ICT teachers

face in the teaching of the subject. I also aimed at finding out how often ICT teachers in Cape Coast metropolis have in-service training. In addition, the study sought to find out the measures government has put in place to assist ICT teachers in teaching the subject, to see if these measures put in place have any impact on teaching ICT in Cape Coast metropolis and to find out whether teachers who teach ICT have the required qualification in computer science or ICT.

Research Questions

The study sought to answer the following questions:

1. What qualification do ICT teachers have?

2. How often do ICT teachers in Cape Coast undergo in-service training?

3. What measures has the government put in place to assist ICT teachers in teaching the subject?

4. What challenges do ICT teachers face in the teaching of the subject?

Significance of the Study

The findings of this study will inform the Cape Coast Education Directorate, the District Assembly, the Ministry of Education and other stakeholders in education on the lapses in the teaching of ICT and the needed ICT logistics such as computers, printers, scanners, laboratories etc. The findings of this research will also portray as to whether ICT teachers in the Senior High Schools have acquired the requisite skills in teaching ICT.

Delimitation of the Study

The study covered both the public and the private Senior High Schools in the Cape Coast metropolis. It specifically dealt with ICT teachers. The scope of the study was restricted to issues directly related to the teaching of ICT in the Senior High School levels. In the light of this, the findings, recommendations and suggestions that were made from   the study were basically applicable to the Cape Coast Metropolis.

Limitation of the Study

Basically the study was carried out in the Cape Coast Metropolis. This study should have covered a wider scope but due to limited resources such as time   and   funds, I could not widen the scope to pave way for   a more comprehensive study whose findings will be more generalized to the whole country.

Definition of Terms

Information   and Communication Technology (ICT) : it is   a   term that includes any communication device or application , which comprises of radio , television , cell phones , computer and network hardware and software, satellite systems and so on , as well as the various services and applications associated with them , such as video conferencing and distance learning.

The term ICT is also used in Ghana to describe both the study of and the use of computers and other technologies that are used for Communication

and Information Systems. In this study, I used the following definition of ICT: "digital technology, communications tools, and/or networks that help to access, manage, integrate, evaluate, and create information in order to function in a knowledge society. I utilized Farrell's (1999) "educational equality" model, particularly the concepts of "equality of access" and "equality of output," to explore ICT provision and implementation in Ghanaian secondary schools. The study employs these concepts and the history of Ghanaian educational development to examine how ICT is likely to perpetuate the existing inequalities in Ghana's educational system. "Digital divide" is defined as the absence of equity in ICT implementation and is likely to widen the knowledge gap that exists between the urban (core) and rural (periphery) communities highlighted in the development literature (Farrell, 1999; Samoff, 1999).

 Computer: it is an electronic device that receives, process, stores and presents data.

Organization of the Rest of the Study

The study tends to find out the challenges associated with the introduction of ICT at the Senior High Schools. The first chapter entails the background of the study. It attempts to explain the need for the study and also includes other items such as the statement of the problem, purpose of the study, significance of the study and research questions. Other items included in chapter one are delimitations, limitations and organization of the study.

In chapter two, I reviewed the related literature. This describes what scholars in education have said and written about the introduction of ICT in schools. The methodology and research design used in conducting the survey and the data collection instruments are described in chapter three. Chapter four consist of results and discussions. Summary of major findings, conclusions and recommendations are in chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

In this chapter , a review will be made of related literature on the challenges associated with the introduction of ICT in Senior High Schools in Ghana. The review covered the following areas: Accessibility of ICT; Technology for all and equality of output; Ghanaian ICT policy framework; access and use of Information and Communication Technology tools and Education in a technological world, Factors Influencing Teachers Adoption and Integration of ICT, Personal Characteristics, Teachers' attitudes, ICT Competence, Computer self-efficacy, gender and Teaching Experience and Readiness.

Accessibility of ICT

Accessibility of ICT in secondary schools also interconnects with other development issues, such as accessibility and connectivity to electricity and telephone grids. The themes that emerged from the policy arena challenges to ICT in rural schools are lack of telecommunication and resources (finance, infrastructure, personnel and their training, software, and textbooks). The telecommunication and expenses was considered in this section while the issue of resources was considered in the next section. Since 1998, the government of Ghana has extended electricity to many rural communities in the country. However, many rural communities are yet to be connected to the electricity grid.

Most rural communities that have secondary schools do not currently have access to electricity and telephone services. In such localities, the idea of promoting computers in classrooms required more financial backing, and a considerable amount of time, considering the pace of development in Ghana. In a Ghanaian case study (Ismail, 2002), it became apparent that the high costs for providing electricity (where there is none) and connectivity to telephone services are major setbacks to providing ICT in rural areas in Ghana. Students enrolled in premier schools like the Achimota School, Wesley Girls School, and Prempeh College and those in urban areas who have easy access to computers and Internet cafés have already made a considerable increase in the use of computers and the Internet do not face such challenges. On the contrary, most students enrolled in rural secondary schools have never set eyes on a computer. While students in urban areas can now boast of their proficiency in the use of Internet and basic computer programs, the silent majority of their colleagues in the rural secondary schools do not have a clue as to how to click a mouse. In my study, students in both rural and urban areas acquired knowledge in the use of the computer and its accessories. Practical lessons were taught by teachers so that students will know how to navigate with the computer properly.

Availability of an appropriate environment for ICT facilities is another issue that will determine accessibility of ICT for rural schools. Some schools have successfully implemented ICT projects because they possess the infrastructure to accommodate ICT equipment donated by benevolent organizations. Inadequate infrastructure is a problem facing many rural secondary schools. The

infrastructure of most rural schools lacks the appropriate environment and the needed security for storing ICT equipment, even if they become available. Such concerns are also setbacks to ICT implementation in rural schools. I seeked assistance from the government and NGO's to provide good and proper infrastructure to all schools in the rural areas doing ICT. My study also ensured that proper storage facilities were given to the schools. I also ensured that the computer laboratories in most schools were situated in a siren environment.

Technology for all and Equality of Output

The use of ICT in secondary schools soon became a policy mandate in the Ghanaian educational system. The government has made the promise to extend computers and Internet services to every secondary school in the nation. The Ministry of Education has developed a curriculum for ICT training. The Ministry has also indicated its plan to include ICT in the Senior Secondary School Certificate Examination. These developments at the policy levels show that ICT w became a tool for assessing students' ability and determining their fitness for transition to post-secondary education and employment. This is where the equality of output concept comes into play. Farrell (1999) posited that among those who have reached a given level of the school system, children who are in rural areas or those from marginalized groups learn less. The school system was able to ensure that students who are at the same level of the secondary system are provided with the same ICT knowledge and skills? The history of Ghana's educational development and recent case studies all point to the fact that the

13

distribution of educational resources especially, material inputs, teaching personnel, and well-equipped facilities, have always been skewed in favor of some section of the society. (Folson, 1995; Graham, 1971; McWilliam & Kwamena-Poh, 1975; Mfum-Mensah, 2003). These educational resources pointed out above have direct effect on students' acquisition of knowledge and learning, and hinder equal implementation of ICT policies.

Many urban secondary schools in the nation have now implemented ICT as part of their schools curriculum. However, most secondary schools in rural areas do not yet have access to ICT. Students in schools that have ICT facilities are using this tool for projects and are able to connect with schools around the world. Through ICT students and teachers in these schools are contributing to the knowledge production and information sharing with other students and teachers around the world. Analysis of the NGO documents and other emerging case studies in Ghana revealed some interesting themes, which needed to be considered in the light of equality of output. First, the implementation of ICT has resulted in positive impacts in secondary schools that have ICT programs.

Second, the dimension of impact extends to include students and teachers. Third, the provision of technical support for ICT has been a challenge for its effective implementation (Ismail, 2002). The World Bank impact assessments revealed that through ICT, students in Ghanaian schools have gained knowledge and skills. The case study also points out that through ICT, students have gained positive attitudes toward school, and collaborative learning projects have been implemented in schools. Similarly, the tool has contributed to teacher's

professional satisfaction. These revelations show how some schools and students have taken the lead in the acquisition of ICT skills and knowledge even before its inclusion in the school curriculum.

The literature and other emerging Ghanaian case studies on ICT implementation revealed that technical support is a challenge to ICT implementation (Ismail, 2002; Ministry of Education, 2002). This body of literature points out that the major challenge for schools that have ICT is lack of resources and proper implementation by trained personnel. As can be seen through previous policy implementation processes and case studies, due to the scarcity of educational resources in rural areas, there is the probability that the distribution of educational resources skewed in favour of those in urban schools (Folson, 1995; Mfum-Mensah, 2003). It is most likely that a situation was created where schools that have the technical support got comparative learning advantages over those without, therefore creating a digital divide in the school system.

Ghanaian ICT Policy Framework

Milli, Fayad, Brugali, Hamu and Doris (2002). defined a framework as a set of interacting objectives that together realised a set of functions. A framework for educational policy and practice is therefore a working objective that highlights the participants, the relationship between the participants, and the set of interaction scenarios between the participants. An educational policy framework can help to define the roles and responsibilities of educational actors,

which include policy makers, administrators, teachers, students, funding agencies, development organizations, and civil society. As a blueprint, an educational policy framework can be a process through which various actors and policy makers translate educational policy into practice.

In spite of the benefits of a policy framework highlighted above, to date, Ghana's Ministry of Education has not established a clear framework for the implementation of ICT. Almost six years after some premier and urban schools ushered into their first experience with ICT, the Ministry of Education has now submitted a draft ICT policy to the Cabinet for approval. Because of the lack of a policy framework, ICT implementation in the school system is currently uncontrollable and irrespective of government initiatives. The literature on Ghana's ICT policy (Ismail, 2002) revealed that there is currently no coordination on the proposed national ICT policy. Second, the other ministries are not actively involved in the policy formulation process. Third, there is lack of human resource capacity to devise and implement an appropriate ICT policy for Ghana. These policy level issues make the implementation of ICT in the educational sector more challenging. This problem does not pertain only to the Ghanaian education system but also most educational systems in the developing world. Hawkins (2002) posited that while many educational ministries around the world have made the commitment to computerize schools, few have developed coherent strategies to integrate its use fully as pedagogical tools in the classrooms. Despite the above challenges, education policy makers are quite enthusiastic about the introduction of ICT in Ghanaian secondary schools (Ministry of Education, 2002). Since the

introduction of ICT in the schools curriculum, there has been numerous problems emanating from equipment, infrastructure, electricity etc. In this study, I ensured that all the policies and items needed for the implementation of the subject was provided and documented for future use.

Access and use of Information and Communication Technology tools

Undoubtedly the internet and other ICT tools in general constitute a valuable channel for knowledge dissemination and opportunities for development and growth among nations in the world. The effectiveness of the use of computers in education may be an important factor in determining which countries will succeed in the future. There is abundant evidence in the literature to support the proposition that the integration of ICT (for example: computer, internet, mobile phone) effectively in teaching and instruction can facilitate acquisition of 21st century skills. Taking into consideration the processing capabilities of ICT tools, it must be argued that: 1) ICT may enable learners to elaborate their mental models and correct their misconceptions with the use of a macro world; 2) ICT can enable learners to connect their symbolic learning in school to real world situations; and 3) ICT can also enable learners share ideas across different cultures.

Education in a technological world: communicating current and emerging research and technological efforts, number of features of ICT tools is consistent with principles of the science of learning and hold promise for improving teaching and learning. However, lack of pragmatic factors (for example: lack of access of

ICT) can inhibit full utilization of ICT (Computer, mobile phone and internet) in teaching and learning. Access and use of ICT are variable assets in effective education, and hence the benefit of ICT in education can be realised if students have access to ICT tools and use them pedagogically. Since technology is financially expensive in developing countries, access to and use of technology in schools and institutions might be problematic as compared to developed nations. Access to and use of ICT tools in terms of ratio of teachers and students might differ significantly among developing countries and developed countries(Ministry of Education,2002).

Education in a Technological World

There is limited or no information about access to and use of ICT tools (Internet, Computer and mobile phones) among students and teachers in schools. In this regard, in Ghana, it is difficult to make concrete decisions about effective pedagogical models to fit students (digital natives) and teachers (digital immigrants) towards effective integration of ICT into education in this technological era. Within this context the present study is aimed at exploring the challenges in the area of access to and the use of emerging ICT tools among Senior High School students in Ghana.

Information and community technologies (ICT) have become key tools and had a revolution impact on how we see the world and how we live. Today, the place of ICT in education and the world in general cannot be undermined. Modern day businesses are conducted and facilitated through the use of telephones, fax machines and computer communication networks through the internet. This

phenomenon has given birth to the contemporary e-commerce, e-government, e-medicine, e-banking and education among others.

According to Bandele (2006), ICT is a revolution that involves the use of computers, internet and other tele-communication technology in every aspect of human endeavor. The author posited that ICT is simply about sharing and having access to data with ease. It is regarded as the super highway through which information is transmitted and shared by people all over the world.

Ozoji (in Jimoh, 2007) defined ICT as the handling and processing of information (texts, images, graphs, instruction etc) for use, by means of electronic and communication devices such as computers, cameras, telephone. Ofodu (2007) also refered to ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for a wide range of teaching and learning as well as for personal use. From these definitions, ICT could therefore be defined as processing and sharing of information using all kinds of electronic device, an umbrella that includes all technologies for the manipulation and communication of information.

The field of education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries; ICT has made a very profound and remarkable impact on the quality and quantity of teaching, learning research in the educational institutions.

Information and communication technology has the potentials to accelerate, enrich, and deepen skill; to motivate and engage students in learning to help relate school experiences to work practices; to help create economic viability

for tomorrow's workers, contribute to radical changes in school; to strengthen teaching and to provide opportunities for connection between the school and the world. Aribisala (2006) posited that ICT is increasingly playing an important role in organisations and in society's ability to produce access, adopt and apply information. They are however being heralded as the tools for the post-industrial age and the foundations for a knowledge economy due to their ability to facilitate the transfer and acquisition of knowledge. Stressing the importance of the use of ICT in schools, Olurunsola (2007) posited that through ICT, educational needs have been met; it changes the needs of education as well as the potential processes. Message can be communicated through e-mail, telex or telephones particularly the mobile ones.

The pervasiveness of ICT has brought about rapid teleological, social, political and economic transformation, which has eventuated in a network society organized around ICT (Yusuf, 2005). The author posited that ICT is an indispensable part of educational administration as its application makes institutions more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' pedagogical activities. For instance, e-learning is becoming one of the most common means of using ICT to provide education to students both on and off campus by means of teaching online offered via web-based systems.

Looking at the role of education in nation building and the population explosion in the secondary schools these days, the use of ICT in the teaching-learning process becomes imperative. This is true because its adoption by the

teachers will enhance effective teaching. Such issues like good course organisation, effective class management, content creation, self-assessment, self-study collaborative learning, task oriented activities, and effective communication between the actors of teaching learning process and research activities was enhanced by the use of ICT based technology.

Teaching and learning has gone beyond the teacher standing in front of a group of pupils and disseminating information to them without the students' adequate participation (Ajayi, 2008). The author posited that with the aid of ICT, teachers can take students beyond traditional limits, ensure their adequate participation in teaching and learning process and create vital environments to experiment and explore. This new development is a strong indication that the era of teachers without ICT skills are gone. Any classroom teacher with adequate and professional skills in ICT utilization definitely has his students perform better in classroom learning.

A cursory look at the secondary schools in Nigeria has shown that many teachers in the system still rely much on the traditional "chalk and talk" method of teaching rather than embracing the use of ICT. According to Okebukola (1997), computer is not part of classroom technology in over 90% of public schools in Nigeria, thus the chalkboard and textbooks continue to dominate classroom activities. This is an indication that the students are still lagging behind in the trend of changes in the world. This presupposes that there is the tendency for the teachers and students to be denied the opportunities which ICT offers in the teaching-learning activities. There is the need to replace the traditional

pedagogical practices that still underpin the educational system in the country, hence the need for the application of ICT in Nigerian Secondary Schools.

The various ICT facilities used in the teaching learning process in schools according to Babajide and Bolaji (2003), Bryers (2004), Bandele (2006) and Ofodu (2007) include; radio, television, computers, overhead projecttors, optical fibres, fax machines, CD-Rom, Internet, electronic notice board, slides, digital multimedia, video/VCD machine and so on. It appears some of the facilities are not sufficiently provided for teaching and learning process in the secondary schools. This might account for why teachers are not making use of them in their teaching. According to Ajayi (2008), the use of these facilities, involves various methods which include systematized feedback system computer-based operation/network, video conferencing and audio conferencing, internet/ worldwide websites and computer assisted instruction. It must however be stressed that the effective use of the various method of the ICT in teaching and learning depends on the availability of these facilities and teachers' competence in using them. Observation has shown that there are no functional internet facilities in most of the secondary schools. This appears to hinder the extent of teachers' exposure to the use of ICT in teaching.

Teachers as well as students appear not to be knowledgeable in the use of ICT because there appears not to be any official training for both the teachers and the students in the schools. It has also been observed that most secondary schools in Ondo and Ekiti States lack computer literate teachers; irregular power supply

appears to thrive in the schools. The story is not different in many regions in Ghana.

Moreover, it seems the schools could not purchase computers for use because of inadequate fund. Besides, the non-inclusion of the ICT programmes in teachers 'training curriculum seems to be another major challenge facing the adoption of ICT in secondary schools.

Various studies have shown the multifaceted problems militating against the effective use of ICT in the teaching/ learning process in schools. These include: irregular power supply (Yusuf, 2005; Ofodu, 2007); and inadequate computers and accessories (Ajayi & Ekundayo, 2003). Since the world has become a technological world, my study focused on policy makers of educational systems in Ghana who embraced and emerged technology in education by making sure that students learn ICT very well to use it in their day-to-day activities and learn other subject like mathematics.

In recent times ICTs have become an important part of most organizations and businesses of which education is part (Bingimlas, 2009). Bingimlas further argue that ICT play various roles in the learning processes.

According to Wang and Woo (2007) the use of ICT in education is not a new concept as it may be as old as radios or televisions technologies. However, the rapid development of technologies, such as web technologies, ICT integration has progressively attracted the attention of instructors. Jung (2005) says that ICTs are innovative technologies that have provided new possibilities to the teaching profession, and at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching. According to Oye, Iahad, and Ab.Rahim (2012) ICTs can also be used to enhance and support distance learning

and that it is considered to be the digital application equipment to all aspects of education.

There has been an abundance of positive claims in recent years about the potential of ICT in transforming higher education in the twenty-first century (Wang, 2009). ICT has the power to radically change classroom practice. A study conducted by Mahmood (2009) on medical students at University of the Punjab showed that students used the computer for the following social media, collaboration, homework, entertainment among others. Mahmood's work also showed that students used computers more for word processing, presentations, data analysis, and emails.

According to Mahmood, entry-level students conducted electronic literature searches more frequently than the outgoing classes. Dukić, Dukić and Kozina (2012) indicated that continuous ICT evolution and implementation are forcing universities and colleges to respond to trends that are capable of transforming society into a knowledge economy. Habib, Johannesen, and Øgrim (2014) also argue that trends in higher education point toward an increase in technology-enhanced education.

Furthermore, they cite (Yoo & Huang, 2011) as saying that technology acceptance has been identified as a cultural issue that plays a major role in today's learning experience. Oye, Iahad, and Ab.Rahim (2012) also argue that knowledge and ICT usage improves human capacity in all aspects of life in general. This includes fields of human endeavour such as business transactions, industrial operations, and education. Oye, Iahad, and Ab.Rahim argue that failure to use technology by many academics in lesson delivery should be of great concern. Oye, Iahad, and Ab.Rahim believed that the delivery of technology services in a higher educational environment has implications for leadership to meet the reform agenda. In addition to improving administrative efficiencies, leadership must create an environment that appropriately supports technological innovation.

The opinion of Bladergroen, et al. (2012) is that though educators have received training in the use of technology to support teaching, most still felt that

the training they received was not adequate ICT has imparted students' lives in Ghanaian educational institutions. The government of Ghana has made huge investment in distributing laptops and desktop computers to schools and individuals. However, the huge investment is not sufficient as it does not guarantee judicious use of the devices and tools. Continuous evaluation in terms of how such technology is used to enhance the quality of teaching and learning is important. Most initiatives which have led to advancements in ICTs (the Internet, for example) had their origins in the academic community. Afari-Kumah and Tanye (2009) argue that the progress in application of ICTs in education has been slow.

Higher education in Ghana requires adequate facilities in ICT to support face-to-face teaching. Again students are to have access to a networking environment with counterpart students across the globe. According to Habib, Johannesen, and Øgrim (2014) excellent and current learning materials are essential from academic staff to promote quality of education. With ICTs transforming the educational landscape around the world in the information age, higher education institutions in Ghana should rise up and face the challenges brought about by this phenomenal revolution.

Choudhary and Choudhary (2013) also say that for innovative teaching strategies are vital in higher education courses if it is to engage and motivate the newer tech-savvy generation. Choudhary and Choudhary believe that leaders of higher educational institutions are faced with the challenge to position their institutions for the twenty-first century. In order to achieve that, they should recognize the need to do away with practices that are inconsistent with the needs and demands of a knowledge society.

Joy and Ishikaku (2012) believe that the roles of ICT translate into governed rules and learning skills in the use of new technology tools. A person uses these tools to enhance his capacity and become equipped for the future. Students' readiness's to use technologies to their benefits have received some attention from academic departments, faculty members and also through

institutional policy framework on ICT. The theoretical underpinning of this study is embedded in the social constructivist's theory. This theory is chosen because it focuses on the relations and actions where participants interact and orient themselves to reach a specific target. Thus this theory believes that knowledge should be constructed and it must be dependent on the cultural and social context through which the knowledge was constructed.

ICT is a powerful tool that helps to address educational problems, support difficult learning activities and enhances thinking skills. Students' construct their knowledge through group activities such as project presentations, term papers, authentic projects and discussion. For example the University policy on ICT enjoins students to study a compulsory ICT course in their first year of admission irrespective of the level of studentship. Students' thus use various collaborative tools and other ICT devices to support their individual assignment and group assignment.

Factors Influencing Teachers' Adoption and Integration of ICT

Before the review of factors influencing the adoption and integration of the use of ICT by teachers, the concepts of adoption and integration are described. Rangaswamy & Gupta, (2000) describes adoption as the decisions that individuals make each time that they consider taking up an innovation. Similarly, Rogers (2003) defines adoption as the decision of an individual to make use of an innovation as the best course of action available. Rogers (2003) argues that the process of adoption starts with initial hearing about an innovation to final adoption. For the purpose of this study, Rogers' definition of adoption is used.

Earle (2002) linked ICT integration with the concept of wholeness, when all elements of the system are connected together to become a whole. For instance, the two important elements of teaching and learning which are content and pedagogy must be joined when technology is used in lesson. In other way, if

students are offered series of websites or ICT tools (for example: CD ROMs, multimedia, etc) then the teacher is not integrating ICT into teaching since he/she is not tackling the pedagogical issues. Similarly, Williams (2003) described ICT integration as the means of using any ICT tool (Internet, e-learning technologies, CD ROMs, etc) to assist teaching and learning. For the purpose of this study, Williams' definition of ICT integration is adopted.

Several factors influencing the adoption and integration of ICT into teaching have been identified by researchers. Rogers (2003) identified five technological characteristics or attributes that influence the decision to adopt an innovation. Stockdill and Moreshouse (1992) also identified user characteristics, content characteristics, technological considerations, and organizational capacity as factors influencing ICT adoption and integration into teaching. Balanskat, Blamire & Kefalla (2007) identified the factors as teacher-level, school-level and system-level. Teachers' integration of ICT into teaching is also influenced by organizational factors, attitudes towards technology and other factors (Chen, 2008, Tondeur; van Braak & Valcke, 2008; Lim & Chai, 2008; Clausen, 2007). Sherry & Gibson (2002) claim that technological, individual, organizational, and institutional factors should be considered when examining ICT adoption and integration. Neyland (2011), factors such as institutional support as well as micro factors such as teacher capability influencing the use of online learning in high schools in Sydney. This article reviews studies on the use of ICT by teachers and identify factors that included and categorized in the framework of Sherry & Gibson (2002).

Personal Characteristics

Personal characteristics such as educational level, age, gender, educational experience, experience with the computer for educational purpose and attitude towards computers can influence the adoption of a technology, Schiler (2003). Teachers are implored to adopt and integrate ICT into teaching and learning activities, but teachers' preparedness to integrate ICT into teaching determines the effectiveness of the technology and not by its sheer existence in the classroom (Jones, 2004). The attitudes of teachers towards technology greatly influence their adoption and integration of computers into their teaching. According to (Russell & Bradley, 1997), anxiety, lack of confidence and competence and fear often implies ICT takes a back seat to conventional learning mechanisms. Therefore, an understanding of personal characteristics that influence teachers' adoption and integration of ICT into teaching is relevant.

Teachers' Attitudes

To successfully initiate and implement educational technology in school's program depends strongly on the teachers' support and attitudes. It is believed that if teachers perceived technology programs as neither fulfilling their needs nor their students' needs, it is likely that they could not integrate the technology into their teaching and learning. Among the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology

Hew and Brush, 2007; Keengwe and Onchwari, 2008). If teachers' attitudes are positive toward the use of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. Demirci (2009) conducted a study on teachers' attitudes towards the use of Geographic Information systems (GIS) in Turkey. The study used questionnaire to collect data from 79 geography teachers teaching in 55 different high schools. The study revealed that though barriers such as lack

of hardware and software existed, teachers positive attitudes towards GIS was an important determinant to the successful integration of GIS into geography lessons.

In a similar study, Teo (2008) conducted a survey on pre-service teachers' attitudes towards computer use in Singapore. A sample of 139 pre-service teachers was assessed for their computer attitudes using questionnaire with four factors: affect (liking), perceived usefulness, perceived control, and behavioural intention to use the computer. He found that teachers were more positive about their attitude towards computers and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer. Also, Drent & Meelissen (2008) conducted a study about factors which influence the innovative use of ICT by teacher educators in the Netherlands. A sample of 210 teachers was used for the study. Their study revealed that student–oriented pedagogical approach, positive attitude towards computers, computer experience, and personal entrepreneurship of the teacher educator have a direct positive influence on the innovative use of ICT by the teacher.

Research has shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching, Huang & Liaw (2005). Teachers' use of Acer netbooks involving six European Union countries, a large number of participants believed that the use of netbook had positive impact on their learning, promoted individualized learning and helped to lengthen study beyond school day. However, evidence suggests that small number of teachers believe that the benefits of ICT are not clearly seen.

The Empirical survey revealed that a fifth of European teachers believed that the use of ICT in teaching did not benefit their students' learning(Korte & Hüsing,2007). A survey of UK teachers also revealed that teachers' positivity about the possible contributions of ICT was moderated as they became 'rather more ambivalent and sometimes doubtful' about 'specific, current advantages' (Becta, 2008, p.45).

Teachers' computer experience relates positively to their computer attitudes. The more experience teachers have with computers, the more likely that they showed positive attitudes towards computers (Rozell & Gardner, 1999). Positive computer attitudes are expected to foster computer integration in the classroom (van Braak, Tondeur & Valcke, 2008). According to (Woodrow, 1992) for successful transformation in educational practice, user need to develop positive attitudes toward the innovation .In most schools, teachers who teach ICT do not have interest in the subject or does not teach the subject with joy so it makes most of the students lazy when learning ICT. In this study, I ensured that teachers zeal or interest to teach the subject increased and students also embraced the learning of ICT with confidence and joy in their various schools.

ICT Competence

Computer competence is defined as being able to handle a wide range of varying computer applications for various purposes (van Braak et al., 2004). According to Berner (2003), Na (1993) and Summers (1990) as cited in Bordbar (2010), teachers' computer competence is a major predictor of integrating ICT in teaching. Evidence suggests that majority of teachers who reported negative or neutral attitude towards the integration of ICT into teaching and learning processes lacked knowledge and skills that would allow them to make decisions.

In a qualitative multiple case-study research on primary school competence and confidence level regarding the use of ICT in teaching practice conducted in five European countries, Peralta & Costa (2007) found that technical competence influenced Italian teacher's use of ICT in teaching. However, the teachers cited pedagogical and didactic competences as significant factors if effective and efficient educational interventions are likely to be implemented. In Portugal, teachers reported different views regarding the most important competences for teaching with ICT. The experienced and new teachers stressed the need for technical skills and attitude, the innovative teacher's emphasized curricula and didactic competences and the student-teachers cited technical

competence and pedagogical efficiency as significant to integrate ICT in teaching and learning processes.

According to Peralta & Costa (2007), teachers with more experience with computers have greater confidence in their ability to use them effectively. To conclude, Jones (2004) reported that teachers competence relate directly to confidence. Teachers' confidence also relate to their perceptions of their ability to use computers in the classroom, particularly in relation to their children's perceived competence.

Computer Self-efficacy

Research has been conducted on teacher's self-efficacy and reported to have greater effect on their use of ICT. Self-efficacy is defined as a belief in one's own abilities to perform an action or activity necessary to achieve a goal or task (Bandura, 1997). In real meaning, self-efficacy is the confidence that individual has in his/her ability to do the things that he/she strives to do. Thus teachers' confidence refers both to the teachers' perceived likelihood of success on using ICT for educational purposes and on how far the teacher perceives success as being under his or her control (Peralta &Costa, 2007). Teachers' computer self-efficacy is described as a judgment of their capability to use a computer (Compeau & Higgins, 1995).

According to Liaw, Huang and Chen (2007), teachers' computer self-efficacy influences their use of ICT in teaching and learning. Similarly, (Yuen & Ma, 2008) revealed that the Hong Kong teachers' implementation of ICT was depended on simplicity of computer use and perceived teacher self-efficacy.

Christensen and Knezek (2006) described computer self-efficacy as computer confidence in competence. Knezek and Christensen (2006) revealed that teachers' competence with computer technology is a key factor of effective

use of ICT in teaching. Peralta and Costa (2007) conducted a study on 20 teachers' competences and confidence regarding the use of ICT in classrooms.

They revealed that in Italy, teachers' technical competence with technology is a factor of improving higher confidence in the use of ICT. In addition, teachers in Greece reported pedagogical and personal factors as those which mostly contribute to their confidence in ICT use. Also, innovative teachers in Portugal linked the perception of confidence in using ICT with the loss of fear of damaging the computer and at the same possessing absolute control over the computer. However, they reported plenty of available time to work and practice ICT, support of experienced teachers and training as favourable conditions for gaining confidence in ICT usage.

Gender Differences and the Use of ICT

Gender differences and the use of ICT have been reported in several studies. However, studies concerning teachers' gender and ICT use have cited female teachers' low levels of computer use due to their limited technology access, skill, and interest (Volman & van Eck, 2001). Research studies revealed that male teachers used more ICT in their teaching and learning processes than their female counterparts (Kay, 2006; Wozney et al., 2006). Similarly, Markauskaite (2006), investigated gender differences in self reported ICT experience and ICT literacy among first year graduate trainee teachers.

The study revealed significant differences between males and females in technical ICT capabilities, and situational and longitudinal sustainability. Males' scores were higher. Jamieson-Proctor, Burnett, Finger and Watson (2006) conducted a study on teachers' integration of ICT in schools in Queensland State. Results from 929 teachers indicated that female teachers were integrating technology into their teaching less than the male teachers. But the situation was different in mid-western US basic schools where Breisser (2006) found that

females' self-perceptions about technology competence improved while males' self-perceptions about technological dominance remained unchanged in a lego-logo project. The study was in agreement with (Adams, 2002) that female teachers applied ICT more than the male teachers.

This study confirms report by Yukselturk and Bulut (2009) that gender gap has reduced over the past years, presently, a greater number of females than males have used internet and web 2.0 technologies.

However, some studies revealed that gender variable was not a predictor of ICT integration into teaching (Norris, Sullivan, Poirot & Soloway, 2003). In a research conducted by Kay (2006), he found that male teachers had relatively higher levels of computer attitude and ability before computer implementation, but there was no difference between males and females regarding computer attitude and ability after the implementation of the technology. He claims that quality preparation on technology can help lessen gender inequalities.

Teaching Experience and Readiness

Though some research reported that teachers' experience in teaching did not influence their use of computer technology in teaching (Niederhauser & Stoddart, 2001), most research showed that teaching experience influence the successful use of ICT in classrooms (Wong & Li, 2008; Giordano, 2007; Hernandez-Ramos, 2005). Gorder (2008) reported that teacher experience is significantly correlated with the actual use of technology. In her study, she revealed that effective use of computer was related to technological comfort levels and the liberty to shape instruction to teacher-perceived student needs. Also, Baek, Jong and Kim (2008) claimed that experienced teachers are less ready to integrate ICT into their teaching.

Further, Lau and Sim (2008) conducted a study on the extent of ICT adoption among 250 secondary school teachers in Malaysia. Their findings

revealed that older teachers frequently use computer technology in the classrooms more than the younger teachers. The major reason could be that the older teachers having rich experience in teaching, classroom management and also competent in the use of computers can easily integrate ICT into their teaching. The result is in agreement with Russell, Bebell, O'Dwyer, & O'Connor, (2003) who found that new teachers who were highly skilled with technology more than older teachers did not incorporate ICT in their teaching. The researchers cited two reasons: new teachers focus could be on how to use ICT instead of how to incorporate ICT in their teaching. Secondly, new teachers could experience some challenges in their first few years of teaching and spend most of their time in familiarizing themselves with school's curriculum and classroom management.

Boakye and Banini (2008) measured the teacher' readiness for use of ICT from schools in Benin, Cameroon, Ghana and Mali with the objective of determining if the teachers were involved in the process of integrating ICT into education in these countries. Teachers were asked about their skills with regard to ICT and use of ICT in their pedagogical practices. Of the teachers questioned, 71% had never used the computer in class; while 10% used it for classroom activities. About 44% had never used the computer in preparing lesson notes while 49% did. A third of those who used it in preparing lessons did so "always' and the rest "occasionally". These uses included using the computer in Internet searches for content, typing out lesson notes, and designing teaching and learning materials. About 60% of the teachers consider themselves as having knowledge of web browsing, with 71% of them using email. Up to 78% of the teachers learnt on their own on how to use computers. Despite the fact that some teachers did not use ICT at all, they agreed generally that the computer had changed the way students learn.

In another study to explore factors that influence classroom use of ICT in Sub-Saharan Africa, Hennesy et.al. (2010), it was noted that introducing technology into schools is largely dependent upon the availability and

accessibility of ICT resources. It was observed that schools are increasingly being equipped with computers for teaching, learning and administrative purposes; connectivity is improving and students enthusiastic about using computers for learning despite lack of equipment available.

The study cited two main reasons why teachers use ICT. First, teachers feel that their own use of computers benefits the learners, and second, teachers feel learners benefit from using the computers themselves. They cite the 1998-1999 survey that assessed the World Links schools programme where lack of time available in the class, and in the planning schedules, and lack of national policy on the use of computers in schools were cited as biggest barriers to the use of computers by teachers.

These studies used different conceptual models to understand the extent of ICT utilization, and in turn inform on the benefits and impacts of ICTs. There is very limited information available on the experiences of African learners, teachers and school managers on the use of ICTs. Very limited information is available too, on the supply chain of the ICTs in schools – the nature and extent of government ministry involvement, the involvement of the parent and residential communities in which the schools are located and the role of the private sector. Before introducing ICT to schools, there are certain factors that must be taken into consideration. For instance, the age of the student, the gender, the competence level, self-efficacy and even how ready the learner is must be taken into consideration. My study ensured that the Ministry of Education took all the things stated above before introducing the subject. That is why ICT is now studied as a compulsory subject in the second cycle institutions. In addition, when an individual mind is not well developed, it makes learning of certain subjects difficult that is why stakeholders in the educational sectors must consider all the things mentioned above before introducing a subject into the curriculum.

Summary

ICT Teachers are employed to adopt and integrate ICT into their teaching and Learning but teachers' preparedness to integrate ICT into teaching determines the effectiveness of the technology and not by its sheer existence in the classroom. One of the factors that influence successful integration of ICT into teaching are teachers' attitudes and beliefs towards technology. However, according to Hew and Brush, 2007; if teachers attitudes are positive towards the use of Educational technology they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. Moreover, gender differences in the use of ICT have been reported in several studies. Research has revealed that male teachers use more ICT in their teaching and learning processes their female counterparts. Markauskaite (2006). Finally, teachers readiness in teaching ICT does not influence the use of computer technology in teaching (Niederhauser & Stoddart, 2001).

CHAPTER THREE

METHODOLOGY

In this chapter, I discussed the methods and techniques used in the collection of data for the research under the following headings: Research Design, Population, Sample and Sampling Technique, Instruments, Data Collection Procedure and Data Analysis Procedure.

Research Design

The study design employed for the study was a descriptive survey.Descriptive research is a research that specifies the nature of a given phenomenon. It determines and reports the way things are. Descriptive research, thus, involves collecting data in order to test hypothesis or answer research questions concerning the current status of the subject of the study (Gray2004).

Best and Khan (1993) described descriptive research as 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. Amedahe (2002) also maintained that in descriptive research, accurate description of activities, objects, processes and persons is the objective. Amedahe noted that research is not a fact finding per se. In fact, there is considerably more to the descriptive research than just asking questions and reporting answers.

The purpose of the survey was generalised from a sample so that inferences can be made about the characteristics being sought about the population . Descriptive research aims to describe the social system, relations, or social events, providing background information to the issues in question as well as stimulating explanation. Descriptive research is also employed to explain the causes of social phenomena and the consequences between variables so that one is the cause of the other.

Any research undertaking involves lots of cost implications; hence this design was deliberately selected for the study because it would allow for quick data collection at a comparatively cheaper cost. Notwithstanding these, the survey design remained the most appropriate because the study could draw meaningful conclusions from the data obtained. Descriptive research was used to find out the challenges associated with the introduction of ICT in the senior high school levels in some selected schools in cape coast.

Population

The target population which I set out to work on consisted of 50 ICT teachers in seven (7) public senior high schools in Cape Coast namely; University Practice Senior High School, Wesley Girls High School, Mfantsipim Senior High School, Adisadel College, Academy of Christ the King Senior High School, Ghana National College and Aggrey Memorial Senior High School.

Sample and Sampling Procedure

Sampling refers to the process of selecting a portion of the population to represent the entire population. A sample consists of a carefully selected subset of the units that comprise the population. Generally, sampling enables the researcher to study a relatively small number of units in place of the target population, and to obtain data that are representative of the whole target population (Amedahe, 2002). The total sample size for the study was 30 ICT teachers representing 60% and seven public SHS in Cape Coast, representing 70% respectively. The sample size was appropriate because according to Asamoah Gyimah and Amedahe (2013), in most quantitative studies, a sample size of 5% to 20% of the population size is sufficient for generalization purposes.

The simple random sampling method was used to select the seven SHS out of the ten public SHS in Cape Coast. After the selection of the seven SHS, another simple random sampling method was used to select 30 ICT teachers.

A sample frame (the list of all ICT teachers) in the seven selected schools was soughted from the District Education office after which a lottery method was used to randomly select a proportionate number of teachers from each school.

Instrument

The main instrument developed and used for the study was structured questionnaire. It was used to gather information from respondents who were teachers in Cape Coast. This was used because all the respondents were literates. This approach assisted me to obtain relevant responses and avoided inconsistencies while at the same time, I allowed respondents to freely express themselves. All the ICT teachers responded to the same set of questionnaire.

The questionnaire solicited information on the challenges ICT teachers face in the teaching and learning of the subject, how often do ICT teachers undergo in-service training, the strategies being adopted by the Ministry of Education to improve on the teaching and learning of ICT and lastly determine the impact of the strategies of promoting ICT teaching and learning by students.

The questions consisted of two types: open ended and closed ended types. The open ended questions offered the respondents the opportunity to freely express themselves on the issues posed to them while the close ended type of questions restricts the respondents on the options to choose. The close ended item type were mainly five point likert scale items.

Data Collection Procedure

The questionnaire was self-administered to the respondents. This was done in order to have a high return rate. It was administered to all the thirty teachers in the selected schools after permission had been sought from the heads of the schools. Enough time was given to the teachers to respond to the questionnaire. The Sample Size was chosen from Seven (7) schools out of Ten (10). This appropriately represents the Population of the ICT Teachers in the Cape Coast Metropolis. Asamoah Gyimah and Amedahe (2013).

Data Analysis

The data was analysed using SPSS and the result was represented with tables, bar charts and pie chart. The data collected were coded, described and interpreted. Frequency tables were constructed for the response to each item and the results converted into percentage for the analysis.

CHAPTER FOUR

RESULT AND DISCUSSION

Overview

This chapter presents the result that were collected during the study. It also presents the analysis of the data and its discussions. In all, thirty (30) questionnaires were administered. A total of twenty seven (27) were retrieved, representing a 96.4% response rate. The remaining three(3) of the respondents were not available when I was retrieving the questionnaires.

Demographic Characteristics and Background Information

The Demographic characteristics of the respondents are considered under this section. This comprises the gender composition, age distribution, academic qualification, length of teaching experience of SHS ICT teachers in the Cape Coast metropolis.

I wanted to find out the gender distribution of the study. This is shown in Table 1

Table 1: Gender of Respondents

Response	No	%
Male	26	96.3
Female	1	3.7
Total	**27**	**100.0**

The data in Table 1 shows that 27 of the respondents were males representing 96.3% whiles the remaining 1 (3.7%) was a female. From the above it can be concluded that majority of the teachers of ICT used in this study were males. From the literature, it was realised that most women don't take part in ICT because they find the subject being difficult.

Table 2: Age of Respondents

Response	No	%
21-30	13	48.1
31-40	14	51.9
41-50	0	0.0
51-60	0	0.0
Total	**27**	**100.0**

Table 2 above shows the age distribution of respondents indicates that 13(48.1%) of them were between the ages of 21-30, whereas 14(51.9%) fell into the 31-40 age bracket. In the literature review, this indicates that the ICT teachers used in this study are relatively younger and can teach the course or programme for a longer period of time.

Table 3: Personal Experience with ICT

Response	No	%
Never Used	1	3.7
Limited User	1	3.7
Frequent User	9	33.3
Confident User	16	59.3
Total	**27**	**100.0**

Table 3 shows the respondent's personal experience with Computers and it indicates that 16 out of the 27 respondents, representing 59.3% were confident users of Computers, whiles 9 (33.3%) of the respondents representing 3.7% indicated that they have never used a computer before. This implies that there are more youth who are now interested in the use of computers and are even willing to teach with it and further their education in ICT.
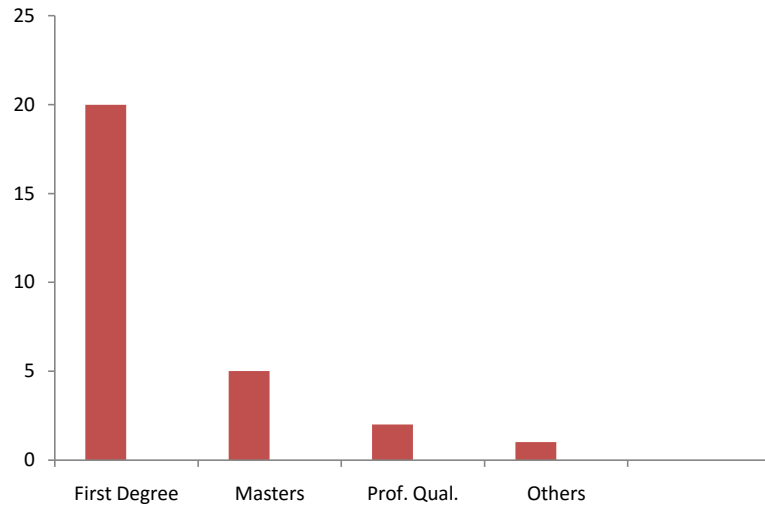
Figure 1: Highest Level of Education

Figure 1 shows the highest level of education of the respondents. The figure indicates that 19(70.4%) of the respondents had first degree as their highest level of education. Five (5) of them representing 18.5% had Masters Degree while 2(7.4%) had professional qualification. Interestingly however, not all the ICT teachers used in this study had ICT certificate. Three (3) out of the 27 respondents representing 11.1% did not have any ICT certificate whiles the remaining 24 (88.9%) had ICT certificates. This is captured in the pie chart in figure 2. This implies that a lot of people are now having degree certificate in ICT than Masters.
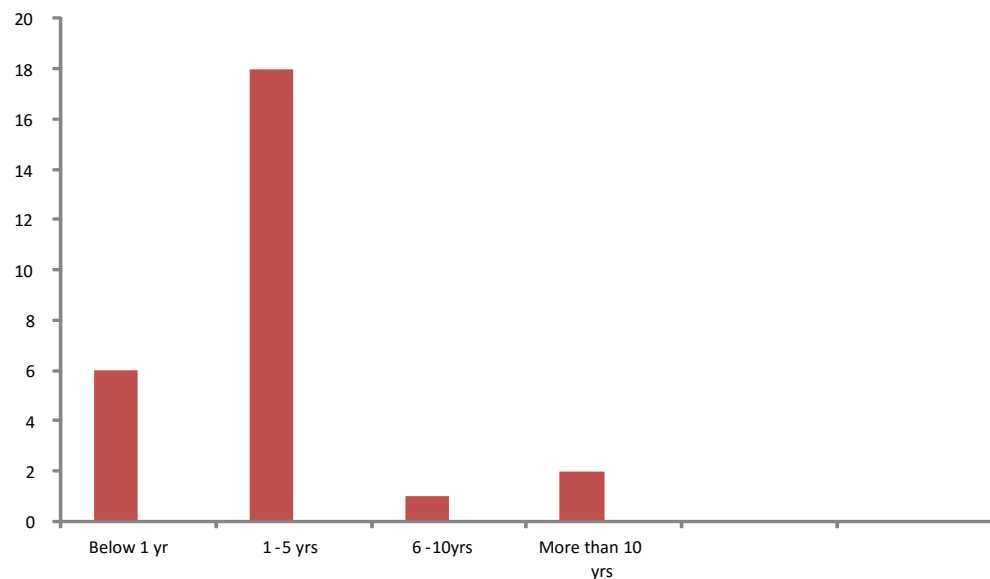
Figure 2: Number of Years of Teaching ICT

Figure 2 above shows the number of years of teaching ICT. The figure indicates that 6 out of the 27 respondents representing 22.2% have taught ICT in their respective schools for less than 1 year. Eighteen (18) of them which represents 66.7% had taught ICT between 1-5 years, whiles 1 (3.7%) and 2(7.4%) fell under 6-10 years and more than 10 years respectively. This shows that a lot of people are now embracing the use of ICT and some have even use it to teach for some number of years now.

Table 4: Competence Rate of ICT Usage

Response	No	%
High	19	70.4
Moderate	8	29.6
Total	**27**	**100.0**

The data in Table 4: shows the ICT competence rate of the respondents used n this study which indicates that 19 (70.4%) stated that their competence rate was high, whiles the remaining 8 (29.6%) had a moderate competence rate. This means that   most of the respondents knows how to use the computer very well and can teach with it.

Table 5 : Students Access To Computers

Response	No	%
Strongly Disagree	8	29.6
Disagree	12	44.4
Agree	6	22.2
Strongly Agree	1	3.7
Total	**27**	**100.0**

The data in Table 5 shows how the students have access to computers in the school. The distribution of respondents indicates that 6(22.2%) have access to computers whiles 12(44.4%) of the respondents do not have access to computers.

Table 6 : Students To Computer Ratio is One To One

Response	No	%
Strongly Disagree	8	29.6
Disagree	15	55.6
Agree	3	11.1
Strongly Agree	1	3.7
Total	**27**	**100.0**

The data in Table 6 shows the students computer ratio in the school. The distribution of respondents indicates that 15(55.6%) do not have one to one access to computers whiles 3(11.1%) of the respondents have access to computers. This implies that a lot of the schools used in the literature lack computers and its accessories.

Table 7: High Cost of Bandwith for Internet

Response	No	%
Strongly Disagree	1	3.7
Disagree	5	18.5
Agree	15	55.6
Strongly Agree	6	22.2
Total	**27**	**100.0**

The data in Table 7 shows that there is a high cost of bandwith for internet usage in the school. The distribution of respondents indicates that 15(55.6%) attest to the fact that the school spends a lot of money buying internet bandwith for their various schools whiles 5(18.5%) of the respondents disagree.

Table 8 : Lack of Internet Accessibility for Research Purposes

Response	No	%
Strongly Disagree	2	7.4
Disagree	7	25.9
Agree	12	44.4
Strongly Agree	6	22.2
Total	**27**	**100.0**

The data in Table 8 shows that most schools lack Internet Accessibility. The distribution of respondents indicates that 7(25.9%) do not have access to internet facilities for their research whiles 12(44.4%) of the respondents have access to internet facilities. This shows that because most of the respondents are in town, they do not lack internet facilities.

Table 9 : Number of Periods for ICT Per Week is Enough

Response	No	%
Strongly Disagree	6	22.2
Disagree	9	33.3
Agree	8	29.6
Strongly Agree	4	14.8
Total	**27**	**100.0**

The data in Table 9 shows the Number of periods ICT lessons are taught per week. The distribution of respondents indicates that 9(33.3%) disagree that

the lesson periods is enough whiles 8(29.6%) of the respondents agree that the lesson periods are enough. This implies that there should be more time allocation for ICT lessons.

Table 10: Textbooks on ICT are Enough

Response	No	%
Strongly Disagree	5	18.5
Disagree	12	44.4
Agree	8	29.6
Strongly Agree	2	7.4
Total	**27**	**100.0**

The data in Table 10 shows whether textbooks on ICT are enough or not. The distribution of respondents indicates that 8(29.6%) agree that the textbooks on ICT are enough for the students whiles 12(44.4%) of the respondents do not agree to it. This indicates that, the government should supply the schools with enough ICT textbooks and materials.

Table 11: Practical Lessons are Carried out more than Theory

Response	No	%
Strongly Disagree	2	7.4
Disagree	13	48.1
Agree	9	33.3
Strongly Agree	3	11.1
Total	**27**	**100.0**

The data in Table 11 shows how frequent the practical lessons are carried out instead of the theory. The distribution of respondents indicates that 9(33.3%) agree that practical lessons are carried out more than the theory aspect

of the ICT lessons whiles 13(48.1%) of the respondents disagree to it. This means that ICT teachers are interested in teaching the theory aspect of the ICT lessons rather than practical. According to Peralta & Costa (2007) in the literature review, teachers must concentrate more on practical lessons rather than the theory.

Table 12: Computers Have Made Channel of Instruction One-way

Response	No	%
Strongly Disagree	7	25.9
Disagree	16	59.3
Agree	3	11.1
Strongly Agree	1	3.7
Total	**27**	**100.0**

The data in Table 12 shows how Computers have made channel of Instruction one-way . The   distribution of respondents indicates that 3(11.1%) agree that computers have made channel of instruction one-way whiles 16(59.3%) of the respondents do not agree. Computers has rather evolved to help the delivery of Instruction very effective.

Table 13: ICT Has Increased Organisational Cost of Running The School

Response	No	%
Strongly Disagree	3	11.1
Disagree	6	22.2
Agree	12	44.4
Strongly Agree	6	22.2
Total	**27**	**100.0**

The data in Table 13 shows the increased cost of running the organization or the school. The distribution of respondents indicates that

12(44.4%) is in support that ICT has increased the cost of running the school whiles 6(22.2%) of the respondents disagree.

Table 14: The Organisation/ School Provides full Support and Incentives for ICT Teachers

Response	No	%
Strongly Disagree	5	18.5
Disagree	12	44.4
Agree	5	18.5
Strongly Agree	5	18.5
Total	**27**	**100.0**

The data in Table 14 shows the support and the Incentives the school provides for the ICT teachers in the school. The distribution of respondents indicates that 5(18.5%) agree that the school provides full support and incentives for ICT teachers whiles 12(44.4%) of the respondents do not agree. They rather lack incentives and full support from the authorities.

Table 15: Students Often Lack Basic Technological Skills and I.T Knowledge

Response	No	%
Strongly Disagree	2	7.4
Disagree	11	40.7
Agree	12	44.4
Strongly Agree	2	7.4
Total	**27**	**100.0**

The data in Table 15 shows how students often lack the Basic Technological skills and I.T Knowledge.   The distribution of respondents

indicates that 12(44.4%) have the Basic Technological skills and knowledge in I.T whiles 11(40.7%) of the respondents disagree that students lack both the basic skills in Technology and knowledge in I.T. According to Berner (2003) and Summers (1990), people are embracing technology and they are integrating ICT into teaching and learning.

Table 16: Rapid Changes in Technology Calls For Skills Update

Response	No	%
Strongly Disagree	8	29.6
Disagree	7	25.9
Agree	10	37.0
Strongly Agree	2	7.4
Total	**27**	**100.0**

The data in Table 16 shows the rapid changes in Technology and the need to update the skills of its users. The   distribution of respondents indicates that 10(37.0%) agree that students are updating their skills to suite the rapid technological changes whiles 7(25.9%) of the respondents disagree that students are updating their skills to meet the rapid Technological changes that have evolved nowadays.

4.2 Presentation and Discussion of Main Data

This section presents results and discussion of the data for the main research questions covered by the study. The main research question and data of specific questions relating to the issue under study are provided.

Research Question 1: What qualification do ICT teachers have?

In trying to answer the research question above, I asked the respondents whether they had any ICT certificate before joining the teaching profession. Their responses are presented in Figure 3 below.
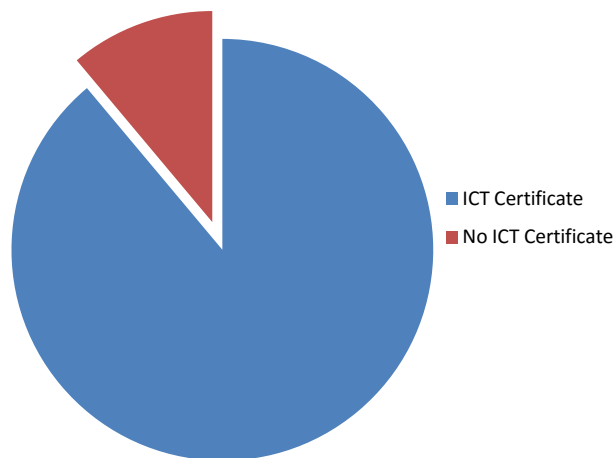
Figure 3: ICT Certificate

Figure 3 above shows that 24 out of 27 respondent representing 88.9 percent had ICT certificate in teaching ICT in their various schools and 3 out of 27 respondent representing 11.1 percent do not have ICT certificate in teaching. According to Boakye and Banini(2008) in the literature review, most teachers teaching in Senior High Schools have first Degree Certificate and even Masters Degree unlike those days where teachers learn small computing and then start teaching others . Since it is now a compulsory course for all first year students in the SHS it needs qualified people to teach.

Research Question 2: How often do ICT Teachers in Cape Coast have in-service training?

Respondents were further asked if they had received any in-service training on ICT from their respective Schools. This question was asked without taking into consideration whether the respondents had any prior training in the use of ICT. The responses are presented in Table 17.

Table 17: How often do ICT Teachers in Cape Coast have In-service Training?

Response	No	%
YES	10	37.1
NO	17	62.9
Total	**27**	**100.0**

Table 17 above shows that as many as 17 (62.9%) of the respondents responded in the negative when they were asked whether they have had any in-service training in ICT before. The remaining 10 (37.1%) responded in the

53

affirmative. A deduction from the above is that majority of the respondents have not had any in-service training in ICT before. This outcome is at complete variance to the study that staff development (including in-service training) is one of the contributing factors to the effective integration of ICT in the classroom. As indicated from table 5 above, it is clear that ICT training in teaching service has not been taken seriously. All human activities require the provisions of appropriate resources to bring about their implementation. In the deployment of ICT in Ghanaian schools, the appropriate human resource is a well-trained ICT teacher. Training ICT teachers is very essential in deploying ICT tools in education, since teachers will be expected to impact what they know to their students. The role of teachers and professional development for integrating ICT cannot be downplayed.

Respondents were further asked about whether or not the school provides support and incentives for ICT teachers. Their responses are presented in Table 18.

Table 18: Support and Incentives Provided for ICT Teachers

Response	No	%
Strongly Disagree	3	11.1
Disagree	5	18.5
Agree	12	44.4
Strongly Agree	7	25.9
Total	**27**	**100.0**

Table 18 shows that 5(18.5%) and 12(44.4%) of the respondents respectively strongly disagreed and disagreed to the assertion that the school provides full support and incentives for ICT teachers.

The remaining 10 (37%) of them however, strongly agreed to the assertion. From the above, it can be deduced that majority of the respondents

were of the view that the school does not provide full support and incentives for ICT teachers. This implies that the School authorities are now given full support to the ICT teachers as well as providing incentive in a form of money to boost their morale to teach the course.

Research Question 3: What measures has the government put in place to assist ICT teachers in teaching ICT?

The respondents were asked whether there are any measures put in place to assist ICT teachers in the teaching of the subject. Table 19 below presents the response of the respondents. From the data in Table 19, 13 (48.1%) responded in the affirmative that indeed there are some measures put in place to assist the teaching of ICT, whereas 14(51.9%) responded in the negative. This shows that majority of the respondents were not aware of any measures put in place by the government to assist IC T teachers in teaching ICT in their respective schools.

Respondents were asked four (4) questions based on the measures the government has put in place to assist ICT teachers to support ICT. Respondents were asked to rate these measures on a four-point scale of strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA). Their responses are presented in Table 20

Table 19: Measures Put In Place By School Authorities/ Government To Assist ICT Teachers

Measures	SD	D	A	SA	Total	Mean	Rank	SD
	No(%)	No(%)	No(%)	No(%)				
Enough period for ICT per week	6(22.2)	9(33.3)	8(29.6)	4(14.8)	27(100)	2.37	2nd	1.006
Time allocation for ICT	6(22.2)	10(37.0)	10(37.0)	1(3.7)	27(100)	2.22	4th	0.847

| Syllabus are readily available | 0(0.0) | 7(25.9) | 17(63.0) | 3(11.1) | 27(100) | 2.85 | 1st | 0.602 |
| Textbooks on ICT are enough | 5(18.5) | 12(44.4) | 8(29.6) | 2(7.4) | 27(100) | 2.26 | 3rd | 0.859 |

Six of the respondents representing 22.2% and 9 (33.3%) strongly disagreed and disagreed respectively, when asked whether the number of periods for ICT per week is enough. However, 8 (29.6%) agreed, whiles the remaining 4 (14.8%) strongly agreed. This shows that majority of the respondents 15 (55.5%) do not see the number of periods for ICT per week as being enough.

Again, majority of the respondents 16 (59.2%) did not believe the assertion that time allocation for ICT lessons are enough. Only 11 of them, representing 40.7% agreed to that assertion. This further indicates that majority of respondents do not think that the time allocation for ICT lessons are enough.

Table 19 depicts that 17 (63.0%) and 3 (11.1%) agreed and strongly agreed respectively to the assertion that syllabus for ICT are readily available, whiles only 7 (25.9%) disagreed. These shows that majority of the respondents agreed that ICT syllabus were readily available.

However, on the issue of textbooks, 17 (62.9%) disagreed that textbooks on ICT are enough, whiles 10 (37.1%) agreed. This is an indication that, majority of the respondents were of the opinion that textbooks on ICT are enough and readily available. It can be seen from Table 7 that, the most important measures put in place by the government is the availability of syllabus (mean=2.85). The least of the measures is Time allocation for ICT in schools. (mean=2.22). This shows that time allocation for ICT is insufficient and stakeholders should ensure that there is enough time for the teaching and learning of ICT. Government is doing its best to provide enough computers to enhance effective teaching and learning of ICT.

Research Question 4: What challenges do ICT Teachers face in the Teaching of the Subject?

This section provides data about challenges ICT teachers face in the teaching of the subject. ICT can offer a range of unique features to educators (teachers) and learners, which are not available using other means. However, certain challenges can be a hindrance to effective teaching and learning. Respondents were therefore asked to rate the challenges they face in the teaching of ICT on a four-point scale of strongly Disagree (SD), Disagree (D), and Agree (A) and strongly agree (SA). Table 20 below summarizes the details of the responses.

Table 20: Response of Challenges ICT Teachers face

Challenges	SD	D	A	SA	Total	Mean	Rank	SD
	%	%	%	%	%			
Access to Computers	8(29.6)	12(44.4)	6(22.2)	1(3.7)	27(100)	2.00	2nd	0.832
Access to computer peripherals	4(14.8)	19(70.4)	4(14.8)	0(0.0)	27(100)	2.00	2nd	0.555
Computer to students ratio (one-on-one)	8(29.6)	15(55.6)	3(11.1)	1(3.7)	7(100)	1.89	4th	0.751
Frequent power supply	1(3.7)	4(14.8)	17(63.0)	5(18.5)	27(100)	2.96	1st	0.706

In Table 20, teachers were asked whether they had access to computer in their schools. Whiles 20 (74%) strongly disagreed, 7 (30%) agreed. This is an indication that majority of the teachers do not have access to computers in their

respective schools. It must be noted that, even though it is generally believed that ICT can empower teachers and learners, this can only be possible if teachers have access to these computers. Lack of access to computers is, therefore, a major challenge in the teaching of ICT.

In a similar instance, majority of the respondents 23 (85.2%) strongly disagreed and disagreed that computer peripherals are available in their respective schools, only 4 (14.8%) agreed that the peripherals are available. On the issue of students' one-on-one ratio to computers, majority of the respondents that is, 23(85.2%) responded in the negative. Only 4 (14.8%) responded in the affirmative that students in their various schools had a one-on-one ratio to computers in the schools. It is no coincidence that most of the respondents also disagreed on the assertion that practical lessons are carried out more than theory.

On the question of frequent power supply to enable them carry out practical lessons, 22 (81.5%) agreed and strongly agreed that indeed their respective schools had frequent power supply. Only 5 (18.5%) disagreed and strongly disagreed. This means that majority of the respondents do not regard the issue of frequents power supply as a challenges in the teaching of ICT in their respective schools. According to (Ismail 2002; Ministry of Education, 2002). This body of literature points out, that the major challenge for schools that have ICT is lack of resources and its proper implementation by trained personnel. As it can be seen through previous policy implementation of processes and case studies, due to the scarcity of educational resources will skew in favour of those in urban schools.

From Table 20, it can be seen that, the most challenge ICT teachers face is the frequent power supply which is always on and off (mean=2.96). However, the least of the response of the challenges ICT teachers face is the student ratio which is one-on-one(mean=1.89). This purports that computers are stills inadequate in various schools and students find it difficult in getting access to the computers for practical lessons. Larry Cuban (2004) states that "ICT still plays a

58

little role in the teaching and learning process in most schools. He further suggest that the failure of ICT in most schools is teachers resistance in using ICT tools in teaching because they do not feel comfortable using it except for the most rudimentary operations, and resources which are not available to train them in teaching methods that incorporates ICT into everyday teaching.

Furthermore, for ICT to permeate teaching, students may have to have access to computers on a scale available in a limited number of schools (every student with a computer) and to databases that are now largely proprietary. He concludes that the general lack of teacher computer skills is the major challenge to the spread of ICT-based learning in schools.

The researcher also sought to find out from the respondents as to how beneficial ICT is in the process of teaching and learning. Table 9 presents a summary of the details, on a four point scale of SD, D, A, and SA

Table 21: Benefits/Importance of ICT

Benefit	SD	D	A	SA	Total	Mean	Rank	SD
	%	%	%	%	%			
ICT encourages and removes distance and time that separate the teacher and the student	1(3.7)	9(33.3)	12(44.4)	5(18.5)	27(100)	2.78	3rd	0.801
ICT allows the teacher to comminucate, share and learn	0(0.0)	0(0.0)	17(63.0)	10(37.0)	27(100)	3.37	1st	0.492
ICT encourages open learning	0(0.0)	2(7.4)	13(48.1)	12(44.4)	27(100)	3.37	1st	0.629

Responding to the statement "ICT encourages and remove distance and time that separate the teacher and the student" 1 (3.7%) and 9 (33.3%) strongly disagreed and disagreed respectively, whiles 12 (44.4%) and 5 (18.5%) respectively agreed and strongly agreed. This means that majority of the respondents believe that ICT is of immense importance due to the fact that it encourages and removes distance and time between teachers and students.

On the issue of whether ICT allows the teacher to communicate, share and learn, all the respondents agreed and strongly agreed, stressing the importance of ICT in communication, sharing and learning.

Again majority of the respondents, that is, 25 (92.5%) agreed and strongly agreed to the statement that ICT encourages open learning whiles only 2 (7.4%) disagreed. This also points out another significant importance of ICT in teaching and learning. Table 21 shows that the most benefits or importance of ICT is that ICT allows the teacher to communicate, share and learn and also encourages open learning (mean=3.37). The least of the response of the benefits or importance of ICT is that it encourages and removes distance and time that separate the teacher and the student (mean=2.78). This implies that teachers must encourage students to have interest in the use of ICT.

According to Brush, Glazewski and Hew (2008), ICT has been used as a tool for students to discover learning topics , solve problems, and provide solutions to the problems in the learning process. ICT makes knowledge acquisition more accessible. He further explains that, concepts in learning areas are understood while engaging students in the application of ICT.

CAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter is made up of the summary of findings of the study, the conclusions that were drawn and the recommendations thereof. The study covered the qualification of ICT teachers, how teachers are often trained, the challenges they face in teaching the subject and the measures the government has put in place to assist them. It also presents areas for further studies.

Summary of Key Findings

The study came with the following findings:

1. Most of the ICT teachers lack in-service training
2. The teachers indicated that even though ICT syllabus are readily available, textbooks on ICT are not enough
3. Most of the respondents indicated that, both the number of periods for ICT per week and time allocation for ICT lessons is not enough.
4. Majority of the respondents indicated that, their respective schools do not provide full support and incentives for ICT teachers.
5. The teachers indicated that the introduction of ICT has increased organizational cost of running the school
6. Majority of the respondents indicated that the rapid changes in technology call for skills update.
7. Most of the respondents cited lack of access to computers and computer peripherals as a major challenge
8. Majority of the ICT teachers indicated that practical lessons are carried out less often, mostly due to the variation in student-computer ratio.
9. Most of the teachers agreed that ICT does not only encourage open learning, but it also removes the distance and time that separate the teacher and the student.

10. ICT must also be taught by teachers who have qualification or certificate in ICT only. However, I think teachers who do not have ICT certificate in teaching must be faded out.

Conclusions

The following conclusions were drawn from the findings of the study.

Firstly, most teachers have the qualification to teach ICT in senior High Schools and even in the Junior High Schools. Teachers are now using degree certificates in ICT and even Masters Degree to teach. This has made them to be more effective and efficient in teaching the Subject. Secondly, In-service training and relevant professional development are essential if the benefits from investments in ICT are to be maximized. Thirdly, the government should provide more computers and its peripherals to teachers to teach the course. Students are now competent with the use of ICT tools and have acquired more knowledge about ICT and they can use the computer to do a lot of things that will benefit them in future. Finally, the challenges most teachers and Schools face is lack of computers, computer labs/space and textbooks on ICT to teach the Students. Due to this, most teachers do not participate in the practical lessons and this affect them.

Recommendations

It is recommended that: 1.Teachers who teach the ICT subject must have the right qualification to teach the Course.

2.There should be frequent training for the ICT teachers.

3. The government should provide proper infrastructure for the learning of ICT in the Senior High Schools.

4. Teachers must be provided with incentives and proper facilities to enhance the teaching and learning of ICT in our schools.

Suggestions for Future Research

The present study was done on the challenges associated with the introduction of ICT in Senior High Schools in the Cape Coast metropolis of Ghana. The study is not exhaustive due to constraints such as time, finance, limited coverage area and sample size. Therefore, similar studies could be done at the district levels or the whole region in order to make a case for generalization. Similar studies can also be conducted in the Basic schools.

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APPENDIX

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION

QUESTIONNAIRE

This questionnaire has been designed to solicit information from ICT teachers from selected senior high schools in the Cape Coast Metropolis on the research topic "Challenges Associated with the Introduction of ICT in Senior High School in the Cape Coast Metropolis". It is purely for an academic purpose and it is in partial fulfillment of the requirements for the award of Master of Education in Information Technology degree. Please be assured that your responses will be treated confidential.

Please tick √ in the appropriate box where applicable.

SECTION A: PERSONAL DATA

1. Gender:

    a. Male   [   ]

    b. Female   [   ]

2. Age

Year	21 – 30	31 - 40	41 - 50	51 - 60	Above 60

Tick					

3. Do you own a personal laptop/computer?

    a. Yes   [   ]

    b. No   [   ]

4. How is your personal experience with ICT?

    a. Never used   [   ]

    b. Limited user [   ]

    c. Frequent user [   ]

    d. Confident user [   ]

SECTION B: EDUCATIONAL QUALIFICATION

5. What is your highest level of education?

[ ] First Degree

[ ] Master and above

[ ] Professional Qualification

    Other, please specify………………………………………………

6. What is your area of specialization?

……………………………………………………………………………………

……………………………………………………………………………………………

7. Do you have an ICT certificate?

    a. Yes   [   ]

    b. No   [   ]

8. How long have you taught ICT in this school?

Year	Below 1 Year	1 – 5 Years	6 – 10 Years	More than 10 years
Tick				

9. How do you rate your ICT competence level?

    a. High   [   ]

    b. Moderate   [   ]

    c. Low   [   ]

SECTION C: CHALLENGES ASSOCIATED WITH THE INTRODUCTION OF ICT

The following statements indicate the challenges associated with the Introduction of ICT. Please indicate the extent to which you agree or disagree with the following statements by ticking [√] the appropriate boxes. Kindly respond to all the statements. 1. Strongly Disagree 2. Disagree 3. Agree   4. Strongly Agree

	Access	Strongly Disagree	Disagree	Agree	Strongly Agree
10	All students have access to computers				
11	All students have access to computer peripherals				
12	The ratio of computer to a student is one is to one				
13	The school have access to internet				
14	The school has frequent power supply				
	Cost				
15	My school is faced with the problem of cost of purchasing computing equipment.				
16	Cost of bandwith for internet connectivity is high				
17	My school has problem of organizing in-service training for ICT teachers				
18	The high cost of internet access discourages management from making internet accessible for research purpose				
19	The school faces the problem of acquiring educational software at high cost				
	Teaching and Learning				
20	The number of periods for ICT lessons per week is enough				
21	Allocation of time for ICT lessons are enough				
22	Syllabuses for ICT are readily available				
23	Text books on ICT are enough				
24	All students participate during practical lessons				
25	Practical lessons are carried out more than theory				
	Interactivity and User Friendliness				
26	Learning with computers makes the learner not being active in the learning process				
27	Learning with computers enable learners to choose topics, answer questions				

		Strongly Disagree	Disagree	Agree	Strongly Agree
28	Computers have made channel of instruction one-way				
29	Computers do not allow students to think critically in the learning processes				
30	ICT encourage and removes distance and time that separate the teacher and the student.				
31	ICT allows the teacher and the students to communicate, share and learn				
32	ICT encourage the type of learning that is not restricted to one particular place but can be done anywhere				
	Organizational Issues				
33	ICT has increase organizational cost of running the school / institution				
34	There is cooperation among the teachers who teach ICT				
35	The organization provides full support services and other incentives for ICT teachers				
	Novelty (Newness)				
36	The explosion of new technologies such as the web 2.0, web 3.0 and others pose a serious challenge to students				
37	These ICT's sometimes, instead of extending students learning, provide limitations and structure which influence the nature and boundaries of activities				
38	Students who are digital generation which is assumed to be totally proficient with technology, often lacks basic technological skills and IT knowledge.				

		Strongly Disagree	Disagree	Agree	Strongly Agree
39	Lack of creativity and innovation in schools has been attributed to technology design because it is designed for the market rather than for education				
	Speed				
40	Continuing and constant changes technology poses learning challenges to students and educational institutions.				
41	ICT revolution poses the problem of equity to educational pattern between countries and within countries				
42	The rapid change in technology calls for continuous update of skills and knowledge to be abreast of development continuously evolving				
43	Constant changing and modification of technology is not just an intellectual challenge but also an economic one				

SECTION D: MEASURES PUT IN PLACE BY SCHOOL AUTHORITIES/ GOVERNMENT TO ASSIST ICT TEACHING TEACHER

44. Are there any measures put in place by the school/government to assist ICT

teachers in   teaching ICT?

Yes   [   ]   No [   ]

45. If yes, mention some of them.

i.   …………………………………………………………………

ii.   …………………………………………………………………

iii. …………………………………………………………………………

i. …………………………………………………………………………

ii. …………………………………………………………………………

46. Suggest any other measures that can be put in place to assist ICT teachers in teaching ICT

i. …………………………………………………………………………

ii. …………………………………………………………………………

iii. …………………………………………………………………………

iv. …………………………………………………………………………