UNIVERSITY OF CAPE COAST

ASSESSING THE INTEGRATION OF ICT RESOURCES IN TEACHING AND LEARNING IN SELECTED SENIOR SECONDARY SCHOOLS IN THE CAPE COAST METROPOLIS

BY

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DECLARATION

Candidates Declaration

I hereby declare that this 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……

Alexander Amenu

Supervisors Declaration

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

Signature…… Date……

Prof. Isaac Galyuon

ABSTRACT

Despite the effort Government and other stakeholders are making to support Ghanaian senior high schools in ICT, most of the schools are teaching ICT as an isolated subject rather than integrating the ICT resources into the educational curriculum to improve teaching and learning. The objective of the study was to assess the integration of ICT resources in teaching and learning in senior secondary schools in the Cape Coast metropolis. A total of 270 respondents took part in the survey. Five senior secondary schools were selected. This comprised of teachers and students. Random sampling was used to select the respondents and questionnaires were the instruments used for the survey. The Data were analyzed using SPSS version 21.0 software to produce frequencies and percentages. Result of the analysis indicated that teachers who had background knowledge in ICT were the ones who used it in their lesson delivery, also students were interested in using ICT in their learning but could not so due to lack of access to the facility in their various schools. This was as a result of inadequacy, or absence of the technology. The study recommended to Government and other stake holders to come to the aid of Senior Secondary Schools to provide ICT infrastructure for these schools, and make them available to students. It was also recommended that ICT training should be organized for teachers to facilitate the smooth integration of ICT into the school curriculum.

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God Bless You All.

DEDICATION

To my dear wife Esther and my two wonderful kids, Princess and Divine

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CHAPTER ONE

INTRODUCTION

Background to the Study

Information and communication technology (ICT) has become an important part of most organizations and businesses (Zhang & Aikman, 2007). Computers began to be placed in United States schools in the early 1980's, and several researchers suggest that ICT will be an important part of education for the next generation too, (Bransford, Brown & Cocking, 2000; Grimus, 2000; Yelland, 2001). Dawes (2001) was of the view that new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have in the past not been possible been difficult.

Although ICT has several definitions depending on the nature of its use, for this review it is used as an umbrella term that includes any communication devices or applications, encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems, as well as the various services and applications associated with them, such as video-conferencing and distance learning.

It has been argued by Kozma (2015), that ICT is a principal driver of effective teaching delivery, economic development and social change worldwide. In many countries like Singapore, Malaysia, Thailand and Indonesia, the need for economic and social development is used to justify investments in educational reforms and in educational ICT (World Bank, 2002). Another notable argument to this effect is by Kelles-Viitanen (2003), who referring to developing countries in general, commented that ICT plays a

major role in all aspects of national life, such as in politics, in economics, as well as in social and cultural development. She further argued that ICT is rapidly transforming the way people do business, access information and services communicate with each other and even entertain themselves.

The role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy (Rosen and Well, 2014; Thierer, 2014). Most experts in the field of education agree that, when properly used, information and communication technology hold great promise to improve teaching and learning in addition to shaping workforce opportunities (Kirschner, Woperies & Collins, 2003; Pelgrum & Law, 2003; Robbins, 2008; Teye, 2012).

In Africa, concerted efforts have been made by many governments to initiate Internet connectivity and technology training programmes (Carlson & Firpo, 2011). Such programmes link schools around the world in order to improve education in the 21st century. The developments and exploitation of Information and Communication Technology (ICT) in schools in Ghana has had an operational history that is just over a decade old (Dankwa, 2007). Although at the beginning, there had been several efforts at developing ICT in schools, there had not been any defined policy direction for ICT in education as to what specifically was needed to be achieved and the strategy for it (Abdulai, 2003). In the process, several initiatives on ICT in education were started by different interest groups to meet different needs (Dankwa, 2007).

Towards the end of year 2003, the tempo increased with the development of the national ICT for Accelerated Development Policy. As at now, the use of ICT (computer) is becoming more persuasive in Ghana and the

number of computers for educational purposes in our institutions is growing. It is on these premises that the Government of Ghana is committed to the transformation of the economy in addition to the agro based economy of Ghana into an information-rich and knowledge-based economy and society using the tools of information and communication technology (ICT).

The Government of Ghana has acknowledged the need for ICT training and education in the schools, colleges and universities and the improvement of the education system as a whole. The development of ICT in education will result in the creation of new possibilities for learners and teachers to engage in new ways of information acquisition and analysis (Teye, 2012). ICT will also enhance access to education and improve the quality of education delivery on equitable basis. Hence, the Government's commitment to a comprehensive programme of rapid development and utilization of ICT within the education sector to transform the education system and thus, improve the lives of people. It is the desire of Ghana Government that, through the development of ICT in our Educational Institutions, the cultural practices of traditional-based learning will be transformed to education that stimulates thinking and creativity necessary to meet the challenges of the 21st Century (Bottino, 2003).

In a statement on the government's policy on ICT (Ministerial ICT Policy Statement 2005), the Minister for Communication acknowledged that the information and technology age has provided opportunities for Ghana to mitigate the problems of decade-long stagnation and poor economic performance. He explained further that the Ghanaian Ministry of Education, Science and Sports has teamed up with the Ministry of Communication and

the Intel World Ahead Programme to set up the local Ghanaian version of the Intel worldwide digital education content platform (currently operating in South Africa and Nigeria). The objective of this initiative is to provide an integrated platform for science and mathematics education.

The integrated platform also aids students with curriculum-focused multimedia learning, offering open-ended learning tools to help them explore wider concepts and providing valuable exam-focused resources for their preparation for state examinations (eLearning Africa News portal, 2009). The Computers for Africa Schools Project has equipped two schools in Ghana with networked laboratories containing a total of 50 refurbished desktop computers and Internet connectivity. The facility has enabled primary and junior secondary school children to learn basic computer hardware and software technologies, keyboarding, Internet, browsing and e-mail usage.

Statement of the Problem

The importance of ICT is quite evident from the educational perspective. Though the chalkboard, textbooks, radio/television and film have been used for educational purposes over the years, none has quite impacted on the educational process like the computer (Grade & Grade, 2007). They have further argued that ICT has the capacity to provide higher interactive potential for users to develop their individual, intellectual and creative ability.

Today, computers perform a host of functions in teaching and learning as many nations are adding computer literacy, reading and writing literacy as skills students will need for succeeding in a technologically driven world (Thomas & Kobayashi, 2014). At the instructional level, ICT tools are used by pupils to learn reading, mathematics, social studies, art, music, simulation and

health practices. All over the world, almost all governments strive to develop a general strategy for ICT and also produce strategies for teaching and learning. Today, Information and Communication Technology (ICT) has, however, assumed a very important role in education and society at large. ICT use in education has constantly been reviewed in countless researches with most recommendations from such researches encouraging its use as well as further researches into specific areas of education (Ahiatrogah & Barfi, 2016).

However, going round most secondary schools in Cape Coast have revealed that there are not enough training opportunities for teachers in the use of ICT in the classroom environment. In the Cape Coast Metropolis, where the study is set, ICT equipment needed to enhance quality teaching and learning delivery pose another challenge; laptops, desktop computers, projectors, speakers, scanners, among others, are still expensive even though prices keep on reducing on the global computer-device market. Students are the worst hit victims in this area.

In spite of the various strategies and policies put in place by the Government of Ghana, one ought to give a serious consideration to factors capable of militating against the integration of ICT resources in teaching and learning in the senior high schools. This call for concern and the need to probe further through research, especially now that ICT has been made a core subject at the senior high school (SHS) level (MoE, 2015). Therefore, this research seeks to find out the level of integration of ICT resources in teaching and learning in five selected senior high schools (SHSs) in the Cape Coast Metropolis.

Objectives of the Study

This study seeks to:

i. Determine ICT resources available for use by students and teachers in the teaching and learning environment at Cape Coast Metropolis.

ii. Determine the attitudes of senior high school teachers and students when technology is used in lessons at Cape Coast Metropolis.

iii. Identify the key effects of ICT use on teaching and learning at Cape Coast Metropolis.

iv. Examine the major obstacles militating against the use of ICT in teaching and learning at Cape Coast Metropolis.

Research Questions

The following research questions were formulated to guide the study:

1. What ICT resources are available for students and teachers in the teaching and learning activities at Cape Coast Metropolis?
2. What are the attitudes of senior high school teachers and students towards the use of technology in the delivery of lessons at Cape Coast Metropolis?
3. What are the key effects of ICT use on teaching and learning at Cape Coast Metropolis?
4. What are the major obstacles militating against the use of ICT in teaching and learning at Cape Coast Metropolis?

Research Hypotheses

The research was guided by the following hypotheses:

i. H_0: There is no statistically significant association between the availability and usage of ICT resources both teachers and students.

ii. H_0: There is no statistically significant association between senior high school teachers' attitudes towards the use of ICT resources.

iii. H_0: There is no statistically significant association between senior high school students' attitude towards the use of ICT and the usage of ICT resources in learning.

Significance of the Study

A study into ICT tools used in teaching and learning and their effects will make some contribution to the existing knowledge. At the end of the study, it is hoped that teachers' competency levels in the application of ICT resources in teaching will be improved and their entire performance gap in teaching with ICT resources will be addressed.

Also, the1findings of this1study will1become a1reference tool1for policy makers, Government1and educational1practitioners for future policy formulation1and implementation1in teaching and learning in SHS.

Delimitation of the Study

It would have been best to interview all SHS school teachers in Ghana to examine the integration of ICT resources in teaching and learning in SHSs, to arrive at the best result to make the needed recommendations but owing to limited time to write and present the dissertation, the study was limited to only

five selected SHSs teachers and students in Cape Coast Metropolis teachers in Central Region of Ghana.

Though the study included all teachers and students in the selected schools, it excluded all non-permanent teachers. In terms of content, the study focused only on the teachers who use ICT resources in teaching and learning at the SHS.

Limitation of the Study

The researcher encountered a number of challenges. These included the response rate of the respondents, school vacations holidays, teachers difficult to respond to the questionnaire and teachers' unwillingness to participate in the study could affect the study. These variables cannot be controlled and therefore they could affect the final results of the study. Measures were however taken to minimize the effects of these on the final results of the study by explaining the benefits of the study to them.

Definition of Terms

Attitude: Attitudes refer to one's positive or negative judgment about a concrete subject (Kadel, 2005).

ICT: Information and Communication Technology, which means computers, PDAs, mobile or cellular phones, digital cameras, satellite navigations systems, electronic instruments and data recorders, radio, television, computer networks, and almost anything which handles and communicates information with the support of an electronic device.

ICT Resources: ICT Resources for Educational purposes are presented in three main areas; Information Resources (online data base), Collaboration

Resources (e.g. blogs and wikis) and Learning Resources (e.g. web quest, repositories of educational resources).

Learning: The acquisition of knowledge or skills through study, experience, or being taught through a mobile technological device.

Teaching: It is the ideas or principles taught by an authority through a mobile technological device.

Organization of the Study

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

CHAPTER TWO

LITERATURE REVIEW

Introduction

The chapter presents a review of relevant literature related to the topic of study. The literature is reviewed under the following sub-headings:

Theoretical framework,

ICT resources available for teaching and learning,

Attitudes of teachers towards technology,

Student's attitude towards technology,

Effect of ICT on teaching and learning,

Empirical study and

Obstacles militating against ICT in teaching and learning

Theoretical Framework

The study is underpinned by Kelmans' (1961) Compliance Theory, which states that an individual accepts influence from another person or group because he or she hopes to achieve a favourable reaction from them. The characteristics of compliance is that opinions are only expressed when the person's attitude is observable by the influencing agent who has the means-control and who is seen as limiting the choice of behaviour. The subject is concerned with the attitude of teachers and students towards technology use in teaching and learning.

ICT Resources available for Teaching and Learning

ICT resources are tools that can be used to support teaching and learning. In this study, the types of tools that support the teaching and learning

of ICT in various schools was considered. The use of ICT resources in teaching encourages students to learn.

According to Ghavifek, Kunjappan, Ramasamy and Anthony (2016), ICT resources in education mean teaching and learning using ICT tools. Educational ICT tools or resources are divided into three categories namely: input resources, output devices and others. Input sources include such things as personal computers (PCs), tablets, applications software, student response systems, visualizer or document camera. Output resources/devices refer to such devices as projector, interactive boards, monitors, display, and television. Others include digital camera, digital recorders, switchers and other technologies. The use of ICT tools can lead to improved student learning and better teaching methods with better resources. The resources include laboratories in schools, internet, limited computer facilities for teachers, no central databases are used and no learning management systems are available for purposes of electronic learning.

Davis and Tearle (2008) argue that ICT resources enhance learning when they engage students in active, interactive and collaborative learning. Lavonen (2008) stresses that ICT resources provide teachers with wider choices of resources that facilitate planning and evaluating activities, as well as offer choice of tasks for students in the learning environment. He further adds that when this is done, it helps students feel close to peers.

One can use tools like simulations and 3D virtual worlds in immersive learning environments, to construct scenarios that mimic realistic situations, and allow individuals to train and practice their skills. Ofsted (2011) observes that learning analytics with the aim of improving student retention and

providing high quality, personalized experience for learners can be achieved with the help of ICT resources.

The use of ICT resources in teaching can also support students with special needs. Demkanin (2008) indicates that the use of ICT resources enables students with special needs or difficulties to understand concepts of science subjects. Students also assume responsibilities when they use ICT to organize their work through digital portfolios or projects.

ICT resources for learning offer the possibility of acquiring knowledge, and understanding better procedures during the teaching and learning process. ICT resources offer various forms of work with content and activities work during the teaching and learning process. Eady and Lockyer (2010) argued that an integrated design of learning resources using ICT is an important part of the instructional process that helps achieve expected learning outcomes. Some ICT learning resources are repositories of educational resources, interactive tutorials, and web 2.0 tools.

Repositories of educational ICT resources offer a variety of teaching materials for learning (Eady & Lockyer, 2013). These can be repositories of learning objects composed of content units with activities and evaluation tests in helping students to understand contents in a subject area. Interactive lessons using ICT allow teachers to process guided presentations using text, graphics and audio (Eady & Lockyer, 2013). Also, Nir-Gal (2002) has argued that these resources can replace the closeness of face-to-face session in self-learning and virtual environments to some extent.

Attitudes of teachers towards technology

Attitude refer to been positive or negative judgment about a subject or thing. Hogg and Vaughan (2005) argue that an attitude is a belief, feeling and behavioral tendencies towards an object, groups, events or symbols. Fishbein and Ajzen (2005) has stressed that an attitude is a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object. Oladosu (2012) indicates that attitude is the general feeling or opinion an individual has about an event, object or something. Attitude is a part of cognitive development people use to organize, systematize their experiences and behavior towards something. In the educational setting, teachers' attitudes play a significant role when it comes to the usage of ICT in teaching and learning.

Teachers' attitudes towards ICT are influenced by several variables or factors. Tsitouridou and Vryzas (2003) argue that one of the factors is the training received by teachers on ICT usage. Mukti (2000) indicates that teachers, who have received training on ICT, are motivated to use them in their teaching and learning. Gobbo and Girardi (2001) state that there is a positive relationship between ICT knowledge of teachers and their attitude towards its usage.

Training can significantly influence the ways in which a teacher includes technology tools in the classroom. In an examination of teaching styles and technology integration, the results showed that both personal theories of teaching and the level of competence with technology play a major role in how teachers implement technology in classroom instruction (Gobbo & Girardi, 2001). Teachers, who attended technology-related training courses or

programmes, have positive attitudes toward the use of technology in their teaching (Gray, Thomas & Lewis, 2010).

Also, teachers' knowledge on computers and positive anxiety levels motivate them to use ICT in their lesson delivery (Yildirim, 2000). Kumar and Kumar (2003) have also stated that teachers computers experience level is one of the factors that enhance teachers' usage of ICT in their teaching. In most cases, many of these factors interact with one another to influence teachers' attitudes towards ICT. Teachers' beliefs have a great influence on the teaching methods and strategies style.

Teachers are the key change agents of any educational establishment. Teachers' knowledge of ICT for teaching and learning cannot be undervalued when they are not ready to use them. Ahiatrogah and Barfi (2016), for teachers to be able to use ICT, there is the need for the right attitude to be cultivated towards ICT as a tool for teaching and learning. They further stressed that teachers' attitude is their opinion of acceptance or rejection of ICT as a tool for teaching and learning. For teachers to have the right attitude there should be a forum for teachers to develop their ICT skills, knowledge and ability (Kumar & Kumar 2003).

Oladosu (2012) indicated that teachers show great interest and motivation to learn about ICT potentials and in practice, if they are taught to use them. However, in some Scottish schools, it has been found that even though teachers recognize ICT benefits for themselves and their pupils, they often fail to integrate it in their teaching if they have the wrong attitude. Lack of proper integration, according to Pelgrum (2001), is due to teachers' competence and confidences in skills in ICT use. These are major factors that

condition teachers' willingness to integrate technology in their teaching and learning process.

Also, teachers with good ICT skills used ICT more in their teaching methods (Moseley, Higgins, Bramald, Hardman, Miller, Mroz, Tse, Newton, Thompson, Williamson, Halligan, Bramald & Newton, 1999). Guoyuan, Valckle, Braak and Tondeur (2010) argued that teachers have both constructivist and traditional beliefs about learning and teaching and that constructivist philosophers are highly active ICT users while teachers with traditional beliefs are less likely to use computers and ICT.

Studies conducted by Hennessy and Deaney (2005) and Lowther, Ross and Morrison (2003) indicate that teachers see the use of ICT in teaching and learning helpful. They argued that ICT use makes teaching student-centred and motivate students to do collaborative learning with their colleagues. Lim and Barnes (2002) argued that teachers who have good attitude towards ICT and succeed in using them have long experience in using ICT in teaching. They further stressed that even when they encounter challenges, they are motivated to resolve them because of the benefits they will get at the end of the lesson.

Teachers' attitude towards using knowledge outside their talents and desires tend to be a factor for them to integrate ICT in their teaching. Yasemin (2008) observes that teachers' pedagogical beliefs and philosophies play an important role integrating ICT in their lesson delivery. When teachers eventually develop the right attitudes and are inclined towards the adoption and integration of ICT into classroom instruction, no one can discourage them. However, while the majority of teachers view games as a useful tool in

education and are willing to use games in the future, they maintain a reserved attitude towards the adoption of technology for instruction due to various reasons of benefits.

A study carried out by Veen (1993) revealed that the most important factor effecting teachers' use of ICT was teachers' attitudes regarding what should be taught and the way it should be taught in the classroom. Veen further observed that computer related technical skills were found to be less important than skills related to the teacher's competence in managing activities using ICT in lessons. Mcalister, Dunn and Quinn (2005), in a study of teachers' attitudes towards ICT use in teaching mathematics, found that attitudes towards using computers were very positive, although many of them had limited experience with computers.

Mcalister, Dunn and Quinn (2005) thus concluded that more training and support in ICT should be given to teachers and more value should be placed on the teacher as a role model for students. Lack of in-service training and insufficient technological infrastructures are the factors that significantly influence the effective use of technology by teachers (Gulbahar, 2008). Ridgway and Passey (1991) have stressed the importance of training teachers and exploiting the use of computers more than as a word processor in the classroom. Similarly, Jones (2002) argues that teachers need to become informed users of technology and stresses the importance of technology training.

Attitude of Students towards Technology

Technology is more present than ever in the integration of ICT in teaching and learning. Most students are interested in the usage of ICT, but

their views vary from one another. Studies conducted by Jones (2000) and Salminen-Karlsson (2007) indicate that students have positive attitude towards the use of ICT in their learning. Law, Lee and Chow (2002) report that students view the use of technology in teaching as a means of improving their problem-solving skills, information management and communication abilities.

Technology impacts on students' lives daily and certainly plays an important part in developing students' attitudes. Volk, Yip and Lo (2003) argued that students have positive attitude towards ICT because its use improved the quality of teaching and learning process. Despite employing modern technology in learning to yield the needed results, some students state that ICT use slows down their academic achievement (Juma & Ahmed, 2012). However, Schroeder (2005) argued that students have positive attitude towards the use of technology in accessing information for their studies.

Indeed, many studies have been conducted indicating students' attitudes towards ICT influences academic achievement. Ilgan (2013) observed that academic achievements and students attitudes towards ICT are closely related. He points out that it is necessary to improve attitudes to increase students' academic achievement. In addition, Skryabin, Zhang, Liu and Zhang (2015) have found out that students, who are academically good, prefer using ICT in their learning. Akpinar, Yildiz, Tatar and Ergin (2009) have argued that student's attitude toward science and technology and their academic achievement are related.

There are, however, varying opinions on students' attitude towards ICT. Aljabri (2012) observes that some students have poor attitude towards ICT in their learning. Shieh, Chang and Liu (2011) have argued that the use of

ICT tools alone in learning may not be sufficient to improve students' performance and achievement, thereby discouraging some from using it. Similarly, Lei (2010) has stated that, even though ICT usage is significantly and positively associated with students' learning habits, the usage of this technology has no significant influence on their academic outcomes.

Student attitudes towards electronic learning have been identified as critical to the success of e-learning (Zhang & Bhattacharyya, 2008). Bhuasiri, Xaymoungkhoun, Zo, Rho and Ciganek (2012) have argued that improving student's attitude toward electronic learning enhances basic technology knowledge and skills of students, which motivates them to utilize their learning. Studies conducted by Papaioannou and Charalambous (2011) and Wen and Shih (2008) argued that most students have poor attitude towards the usage of ICT in learning; and as this continues it makes such students lazy in learning.

Effects of ICT on Teaching and Learning

The research seeks to describe the effect of ICT on learning and teaching. The use of ICT in teaching and learning gives students and teachers elements of a subject in sequential order. The materials provide immediate feedback to both teachers and students. The use of ICT in teaching and learning provides an extensive interactivity to users when used as an instructional resource. Papaioannou and Charalambous (2011) argue that when ICT is integrated into classrooms, students are able to access more information faster in an efficient manner.

The impact of ICT on the learning process, therefore, excites and engages both students and teachers interests. Today, most things that are

required for teaching and learning are available at the click of a mouse. Hence, it is necessary for the students and teachers to jump for its use in their teaching and learning activities. A study conducted by Bhuasiri, Xaymoungkhoun, Zo, Rho and Ciganek (2012) indicate that the use of ICT in teaching and learning helps students to retrieve information easily. They further observed that its use helps in analysing and interpreting information in learning. The use of ICT in teaching and learning provides reliable1feedback to students. It enables1students to produce many1examples when exploring1mathematical problems to understand concepts (Forgasz & Prince, 2001).

Technology1helps students to see patterns and1connections differently in mathematics lessons (Gobbo & Girardi, 2001). The technolgy1enables formulae, tables of numbers1and graphs to1be linked readily. Jegede (2008) has argued that the1use of technology allows1students to work1with dynamic images1that cannot be done1within traditional teaching. Students1can use technology to1draw graphs and manipulate1diagrams dynamically. Technology enables1students to work with real1data, which can be1represented in variety1of ways (Gobbo & Girardi, 2001).

There is the belief that ICT can and will empower teachers and students in transforming teaching and learning processes from being teacher-dominated to student-centred. Salminen-Karlsson (2007) indicated that the use of ICT in teaching and learning empowers teachers and students in retrieving and accessing information. This can transform increased learning gains for students, creating and allowing for opportunities to develop their creativity, problem-solving abilities, informational reasoning skills, and other higher-

order thinking skills. Thus, the use of ICT in teaching and learning improves students' performance (Aljabri, 2012).

ICT tools are used differently in different school settings. The use of ICT for simulations and modelling in science and mathematics have been shown to be effective, as have word processing and communication software (e-mail) in the development of students language and communication skills (Shieh, Chang, & Liu, 2011). Therefore, the use of ICT in teaching makes students more efficient and productive in the learning process (Cuban, 2001). Furthermore, ICT use has transformed teaching and learning into engaging students more and helping to prepare students for future workplaces (Cuban, 2001).

ICT can be used to motivate teachers and students. Schroeder (2007) has argued that ICT tools are used to promote learner autonomy in the classroom. He stressed that this offers students and teachers the opportunity to do more in the classroom. A study conducted by Bayraktar (2001) observed that the use of ICT in learning had a small positive effect on student achievement in science when compared to using traditional instructional methods. He further found that the use of drill and practice activities with the support of ICT even had a negative effect on students learning.

The use of ICT in teaching helps the teacher's role to change from that of primary source of information to one who creates structure and provides advice for students, monitors their progress, assesses their accomplishments, and works as a coach (Kozma, 2005). Yuen (2003) suggested that this type of teaching helps students to do productive learning. A case study by Dexter,

Seashore, and Anderson (2002) report that the use of ICT inspired teachers' pedagogical collaboration and functions as a catalyst of change.

Ruthven, Hennessy and Deaney (2005) have argued that teachers' use of ICT helped them give wider coverage of topics and gave access to authentic sources and materials, which helped to establish a sense of contact between the classroom and the wider world. Technology use in1teaching and learning really has the potential to1improve the way teaching is done1and1enhances students' understanding1of basic concepts (Fine & Fleener, 2004).

Furthermore, Sabzian, Gilakjani1and Sodouri (2013) stress that the use of technologies in instruction1assisted the learner in visualizing1the process and concept role of1symbols, which reaches1great heights. Technology1allows real-world applications1to be more readily1used in the classroom (AMTE, 2006; Ellington, 2003). Besides, Furner and Worrell (2017) argues1that technology enhances mathematics1learning by furnishing visual1images of mathematical ideas, facilitating1the organization and analysis of data, as1well as computing efficiently1and accurately.

Empirical Study

Ghavifekr, Abd Razak, Ghani, Ran, Meixi and Tengyue (2014) has conducted1a study to investigate1teachers use of1ICT in teaching, the1findings indicated that the1teachers use the ICT1for finding information such1as articles about research, or1professional issues, or as1a source1of data for1teachers1to analyze lessons delivery.

Similarly, a1study conducted by1Mereku (2009), indicated that technology can be used1in teaching and learning and support the academic responsibilities of teachers. He argued that teachers use technology to type

examination questions1in all subject areas and in1some cases educators1use technology in processing1students' examination results. Their findings further1indicated that very few1teachers in Ghanaian Senior High Schools use1technology in their teaching.

However, Boakye (2013) has also conducted a study to1find out teachers' readiness for1the use of technology in Ghanaian1schools. His findings indicated that1out of 221 teachers surveyed, only 24% have1received some form of training1in the use of computers, with minimal training in the1pedagogical integration of1technology. This indicates1that although mathematics teachers1have realized the impact of1technology in mathematics delivery, they1still need professional training1on how to integrate it1in their teaching.

Similarly, a1study conducted by1Danquah (2012) on teachers' readiness1for the use of technology1in Ghanaian schools indicated1that, 71% of the teachers1did not use technology in1classrooms, 49% of teachers1use technology to prepare1lesson notes, 55% of teachers1have some knowledge of1web browsing, 71% use1email, and 78% tried to1make an effort to1learn how to use the1computer. These figures imply1that effective integration of technology into1Ghanaian classroom instruction. Waite (2004) opines1that even though teachers show great attitude and motivation to learn1about the potential of1technology, in practice, the use1of technology is relatively low and it1is focused on a narrow range of1applications, with word processing being the1predominant use.

Although, technology1use in mathematics improves1mathematics teaching and learning, the1level of technology use in1mathematics fall below

average. A report by the1National Center for Education Statistics (2005) has indicated1that 44% of the American1teachers used technology for1classroom instruction, 42% for computer applications, 12% for practice1drills, 41% required research1using the Internet, 27% had1students conduct research1using CD-ROMs, 27% assigned multi-media1projects, 23% assigned graphical presentations of materials, 21% assigned1demonstrations, 20% required1students to use technology1to solve problems and1analyze data, and 7% assigned1students to correspond with1others using the Internet.

Besides, Fine and Fleener (2004) also1conducted a survey to find1out teachers' use of1technology in secondary schools. Out1of 485 mathematics teachers1sampled, twenty-six percent of the respondents indicated they1had participated in professional1development courses related1to computers, the Internet1and graphics calculators1while 16.7% stated they1had undertaken no professional course in any1of the three types of1technology. Thereby, making it difficult for them to use ICT in their teaching.

Similarly, Crisan (2004) has conducted a1survey to investigate the use1of technology and the1barriers of integrating technology1into the teaching of1mathematics. Their findings1indicated that the level of1technology used by mathematics1teachers in their instruction was1low. Majority of the mathematics teachers1used technology for word1processing (71.1%), spreadsheets (51.2%), internet activity (44.1%), search1engines (44.1%), presentation1software (36.9%) and1databases (21.6%). Out of1the 111 mathematics teachers1surveyed, 39.6% of the respondents stated that they had not used1technology at all1and 32.1% of them stated1that they used technology infrequently. On the1other hand, 22.6% of them responded1that

they had integrated1technology into specific1areas of instructional units1and 5.7% stated that they1had fully integrated technology into1their instructional programs.

Besides, Thomas (2006) has surveyed 32 mathematics teachers1to investigate technology use1and the teaching of mathematics1in the secondary classroom. Their1findings revealed that1while 68.4% of teachers had used computers in1their lessons, 31.6% had not1and 75% of teachers would1like to use the computer more1often. The findings further revealed that1over 90% of the teachers had used1technology in their lessons and the majority1of teachers (56.7%) would like to use1technology that enhances students' performance more1often in their teaching.

However, a study conducted by Becker (2000) to find out how teachers use technology in instruction revealed that1teachers generally1used computer1technology to support1their existing1practices (providing practice drills, demonstration) and communication (such1as the use of1email) rather than1to engage students1in learning that involves1higher order1thinking. Moreover, Slaouti and Barton (2007) conducted a study to find out the opportunity for newly qualified teachers to use technology in teaching in the secondary school. Their findings revealed that technology most commonly1used by teachers1was word-processing, spreadsheets and1to a limited extent, the Internet to improve their teaching.

Similarly, Koo (2008) has conducted1a study to investigate the factors1affecting teachers' perceived readiness1for online collaborative learning. Out1of the 86 mathematics teachers surveyed the findings revealed that, very1few of them (24%) indicated they frequently1use the Internet, 47%

of them1indicated they hardly (never or seldom) use it1and the rest (29%) indicated they1occasionally use it.

In a similar 1situation, Abuhmaid (2011) investigated 120 teachers 1 to explore the extent of their ICT usage. The 1findings revealed that 45.2% of the 1teachers reported searching for 1additional sources on the Internet 1and 32.1% reported using ICT to prepare their 1lessons. However, ICT-based interaction in 1the school culture appeared to have 1minimal presence among teachers, as 1only 4.3% of the teachers reported 1using ICT for communication and 11.3% of 1them reported uploading files (e.g. lessons) to the 1Internet. A study conducted by 1Cuban (2000) to investigate1the extent of technology1use in instruction revealed that very1few teachers are serious users of1computers in the classroom.

Besides, Yildrim (2007) conducted1a study to examine teachers' utilization of technology in1Turkey. Out of the 402 teachers surveyed, the1findings revealed that teachers largely1use technology for creating handouts1and tests, rather than using it to promote1students critical thinking skills and to1foster their higher order cognitive1abilities. The findings further indicated1that due to pedagogical support, teachers reported the lowest1frequency for the use. Thus, teachers1felt most competent on word1processing whereas they felt least competent1for the use of instructional software. However, they indicated bad attitude towards ICT use in lesson delivery.

Besides, Crisan (2008) surveyed 4851teachers in Australia to investigate1the factors influencing technology use1in their teaching periods. Their findings1revealed that pedagogical1knowledge, beliefs, access to

hardware1and software and1participation in professional1development1course were factors influencing1technology use in teaching and learning mathematics. Similarly, Mereku (2009) conducted1a study to investigate teachers' pedagogical integration of ICT in teaching. Their1findings revealed that availability of ICT syllabuses or manual; computers1and computer laboratories that can1be accessed periodically were factors1that influenced technology use at1the Senior High School level in Ghana.

Also, Zhao (2003) investigated1rural and urban respondents in California, Florida, Nebraska, and1New York to investigate the extent1of technology use in USA. Out1of the 3,665 teachers surveyed, their findings revealed1that 14% of teachers1make1no use1of technology for1instructional purposes, and1nearly half (45%) use1it with their1students less1than 15 minutes1per week; equivalent to1just 3 minutes1per1day. However, only 18% of respondents' reported1that they used computers for instructional1purposes for more than 45 minutes1per week. The analysis further indicated1that only 1.4% of the respondents1make extensive use of the1internet for instructional purposes, over1a quarter reported of making1no use of the Internet at all, and1two-thirds of respondents1make minimal use of Internet technologies with their students.

Obstacles Militating Against ICT Use in Teaching and Learning

Integrating ICT into teaching and learning is a complex process and may encounter a number of difficulties. These difficulties are known as challenges. The lack of professional development is one of the most cited reasons for lack of technology implementation (Ertmer, Ottenbreit-Leftwich, Sadık, Sendurur & Sendurur, 2012; Schoepp, 2005).

A study conducted by OECD in 2009 confirmed that there are a number of barriers or challenges that inhibit teachers use of ICT in education (OECD, 2009). These barriers included an inconsistent number of computers to students, a deficit in maintenance and technical assistance and finally, a lack of computer skills and or knowledge among teachers (OECD, 2009). Jenson (2002) classified these barriers as: limited equipment, inadequate skills, minimal support, time constraints and lack of interest or knowledge by teachers.

The most widespread challenge that teachers face is insufficient computer competence and inadequate training regarding ICT use (Albirini, 2006; Güneyli and Aslan, 2009). The main prerequisite for making a decision how and for which purposes to use ICT in teaching and learning lies in teachers' sufficient computer skills. Studies conducted by Papaioannou and Charalambous (2011), Wen and Shih (2008), Jimoyiannis and Komis (2007) and Al-Oteawi (2002) demonstrated negative attitudes of teachers toward ICT integration affects its use in the classroom setting. The research also revealed that there are insufficient courses and training, the teachers are not adequately trained, poor ICT integration, CD ROMS not working and never used, poor support from administration, negative attitude from teachers and lack of technical support skills from the laboratory technician are major obstacles.

In a research report conducted by BECTA (2004), a number of other important barriers were identified as the reasons why teachers do not use ICT to support their teaching. These were: lack of confidence, accessibility, lack of time, fear of change, poor appreciation of the benefits of ICT and age. Ertmer, Ottenbreit-Leftwich, Sadit, Sendurur & Sendurur (2012) concurs with

Schoepp (2005), asserting that if teachers are aware of and understand such barriers, they can initiate strategies to overcome them within the shortest possible time.

Pergrum (2016) indicated that lack of access to resources, including home access to computers and classrooms is another complex challenge that prevents teachers from integrating ICT into lesson delivery. The lack of computers in classrooms has led most of the students to become unfamiliar with using them and to have poor behavioral attitudes toward using computers in their teaching methods (Muslim, 2010). Muslim (2010) further stressed that teachers who have been brought up in a world with limited technology can find it difficult using ICT to engage and support learning.

Several studies have divided the barriers into two categories: extrinsic and intrinsic (Ertmer, 2012). However, what was meant by extrinsic and intrinsic differed among studies. In one such study, Ertmer (2012) referred to extrinsic barriers as first order barriers citing as examples: lack of time, support, resources and training. She referred to intrinsic barriers as second order barriers, citing as examples: attitudes, beliefs, practices and resistance to change.

Therefore, if there is no technical support for teachers, they become frustrated resulting in their unwillingness to use ICT in their teaching (Tong & Trinidad, 2005). Even though, lack of technical support discourages teachers from adopting and integrating technology in classrooms, a study by (Korte & Housing, 2007) revealed that schools in Britain and the Netherlands have appreciated the significance of technical support to help teachers to integrate technology into their teaching.

Study conducted by Pergrum (2016) proved that lack of infrastructure facilities is one of the many causes of poor ICT integration in schools. He further lamented that unavailability of resources for teaching with technology discourages teachers from using ICT in their teaching.

According to BECTA (2004), the inaccessibility of ICT resources is not always merely due to the non-availability of the hardware and software or other ICT tools within the school. It may be the result of one of a number of factors such as poor resource organization, poor quality hardware, inappropriate software, or lack of personal access for teachers.

Furthermore, teachers are usually provided with courses in which they are trained only how to use hardware and software devices for teaching (Okoli, 2000). Courses do not have any pedagogical grounding, namely relatedness to subject that teachers teach in the classroom (Li & Ni, 2011). In this way, it seems to be difficult for the teacher to translate the use of ICT to the teaching. Due to this, teachers tend to encounter a challenge to define when it is appropriate to use ICT in instruction (Lam, 2000). Hence, the content provided at the training courses cannot be transferred to authentic academic settings, and teachers find ICT skills that they obtain there unnecessary for implementation integrating ICT in their instruction (Egbert, Pauius & Nakamichi, 2002).

According to Bingimlas (2009) teacher competence refers primarily to one's ability to integrate ICT into pedagogical practice. Lack of knowledge or competence is regarded as a significant factor that discourages teachers in integrating ICT in their teaching. A teacher's lack of knowledge serves as a considerable challenge to the use of computers in teaching methods and

practices. Tezci (2009) posits that if teachers have a high level of ICT knowledge, then there will be a higher level of ICT use in their teaching.

The lack of confidence in the use of ICT is in most instances accounted for by the inconsistency between training and usage (Yasmin, 2008). This is so because most teachers even if they have received training in the use of ICT, can still fail to integrate it into teaching. BECTA (2004) says that lack of confidence is linked to other barriers affecting the use of ICT. The report mentioned fear of ICT as a factor that can compromise the level of confidence. Other factors that were mentioned included lack of technical assistance which can lead to low confidence levels, lack of competence and the quality of training received (BECTA, 2004).

Cox (2009) asserted that if teachers are to be convinced of the value in using ICT in their teaching, their training should focus on pedagogical issues. According to him, this is due to the fact that even after teachers had attended professional development courses in ICT, they still did not know how to effectively use ICT in their classroom teaching. This was because too much emphasis was placed on acquiring technical ICT skills during training, as opposed to skills in how to incorporate ICT into the curriculum (Yildrim, 2000).

Another issue that teachers encounter in the process of using ICT in the classroom is insufficient amount of time (Lei, 2010). Teachers find it very challenging to integrate technology in their lessons due to insufficient number of academic hours' allocation for subject periods. Apart from this, teachers are constantly required to search for an appropriate technology-based material,

which is a time consuming process and sometimes discouraging (Lei, 2010). Due to this fact, their workload increases (Bilbatua & Herrero de Haro, 2014).

Moreover, insufficient availability of computers in classrooms hindered teachers from implementation of ICT in the instruction (Muslim, 2010). BECTA (2004), has argued that in the environment, where use of technology in teaching is standard practice, teachers find application of electronic devices in their lessons an integral part of the teaching process. They are more likely to give lessons supported with use of information technologies. However, those teachers, who are new to this process, use equipment less frequently or try to avoid using it (Innovative Teaching and Learning Research [ITL], 2011).

Toprakci (2006) found that low numbers of computers, oldness or slowness of ICT systems, and scarcity of educational software in the school were barriers to the successful ICT Implementation in Turkish schools. Similarly, Al-Alwani (2005) found that having no access to the Internet during the school day and lack of hardware were hampering technology integration in Saudi schools. Research on Syrians schools indicated that insufficient computer resources were one of the greatest impediments to technology integration in the classroom (Albirini, 2006).

In a study conducted by Badia, Meneses, and Sigalés (2013), the results concluded that lack of support from school authorities discourages teachers from using technology in their delivery. This is essential even for those teachers who were provided with high quality training and well equipped classrooms with ICT resources (Papaioannou & Charalambous,

2011). The school authorities should encourage and support teachers to integrate technology into their teaching and learning.

Chapter Summary

Teaching using ICT is beneficial for both teachers and students. The use of ICT in teaching and learning gives students and teachers elements of subjects in sequential order of delivery. The materials provide immediate feedback to both teachers and students. The use of ICT in teaching and learning provides an extensive interactivity to users when used as an instructional resource. However, there are some challenges or obstacles that discourage teachers from integrating ICT into their teaching. These barriers included an inadequate number of computers to students for learning, a deficit in maintenance and technical assistance and a lack of computer skills and knowledge in using ICT in teaching among teachers.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter describes the research methodology employed in the study. It includes the area of study, research design, the study area, population and the method of sampling. The chapter also covers instrumentation and its administration, as well as data analysis.

Research Design

The study seeks to look into assessing the integration of ICT resources in teaching and learning in selected Senior High Schools in Cape Coast Metropolis, focusing on the perspectives of students. Since the study entails a survey of teachers and students' views on the issues, the descriptive survey design was deemed the most appropriate research design. Descriptive research design involves systematic gathering of data about individuals and collectivities in order to answer research questions in the study (Ary, Jacobs, Razavieh & Sorensen, 2006). They stated that descriptive research design determines and reports the way things are.

Descriptive survey is the method of research that simply looks at the phenomenon under consideration with intense accuracy and description of precisely what the researcher observes or sees. According to Ary, Jacobs, and Razavieh (1990), descriptive surveys are directed towards the determination of the nature of a situation as it exists in the study.

An advantage of a descriptive design is that it helps the researcher to collect data to enable him draw the relationship between variables in the study

and analyze the data collected. It also helps to observe, describe and document aspects of a situation as it naturally occurs in research (Ary et al., 2006).

However, the use of descriptive design in research is that it is laborious and time-consuming method. It is susceptible to, or easily influenced by distortions through the introduction of biases in the measuring instruments, and so on. It is sometimes regarded as focusing too much on the individual level, neglecting the network of relations and institutions of societies.

Study Area

Cape Coast, or *Cabo Corso*, is a city and fishing port, and the capital of Cape Coast Metropolitan District and Central Region of southern Ghana. Cape Coast is situated on its south to the Gulf of Guinea with a Latitude of 5° 06' 19.26" N and Longitude of -1° 14' 47.76" W. According to the 2010 census, Cape Coast had a settlement population of 169,894 (Ghana Statistical Service, 2010). From the 16th century until Ghana attained independence, the city and fishing port changed hands between the British, Portuguese, Swedish, Danish and the Dutch (Boateng, 2014).

The Central Region is located on the peninsula of Ashanti land and it is one of the ten administrative regions of Ghana. The Central Region is renowned for its many higher educational institutions and an economy based on an abundance of industrial minerals and tourism. The Central Region has many tourist attractions such as castles, forts and beaches stretched along the region's coastline. The Central Region has some of the beautiful beaches and national parks (Ghana Museum and Monument Board, 2010).

Cape Coast was founded by the people of Oguaa. The Portuguese later came to build the Cape Coast castle and so Cape Coast grew around Cape

Coast Castle, now a World Heritage Site. It was converted to a castle by the Dutch in 1650, then expanded by the Swedes in 1652 and captured by the British in 1664. Trade was an important motivator in the creation of fortresses and settlements in Cape Coast. The various European countries that came to what is now the coast of Ghana created interpersonal, lasting relationships with the indigenous peoples as a method of ensuring long-term economic gain.

Population

Population is defined as all members of a defined category of elements such as people, events or individuals items of interest under consideration (Ary, Jacobs & Razavieh, 1990). It must be noted that whatever the basic unit or events, the population always comprises the entire aggregation of elements in which the researcher is interested in gaining information and drawing conclusions. It can also be seen as the target group about which the researcher was interested in gaining information and drawing conclusions. For the purpose of this study, the population is made up of all Senior High Schools students and teachers in Cape Coast Metropolis.

The total number of senior high schools in the metropolis was 16. They are Oguaa Senior High/Technical School, Cape Coast International SHS, St. Augustine's College, Wesley Girls SHS, Mfantsipim SHS, Adisadel College, Academy of Christ the King SHS, Aggrey Memorial A.M.E. Zion SHS, Efutu Senior High/Technical School, Ghana National College, Insaaniyya SHS, University Practice SHS, Sammy Otoo SHS, Harris SHS, Pitmas SHS, and Holy child SHS (MoE, 2015).

Sample and Sampling Procedure

Sampling is a procedure of selecting part of a population for a research to be conducted or undertaken. When this is done, the conclusion drawn from the selected sample can be generalized for the entire population. Leady (1993) simply defines sampling as the process of choosing from a much larger population, so that selected parts represents the total group. Sampling per say is not a technique or procedure for getting information but it ensured that any technique used helped in getting information from a smaller group, which accurately represented the entire group (Teye, 2012).

The sample for the research was chosen from senior high schools in Cape Coast Metropolis. The sampling procedure employed for the study was purposive sampling. Purposive sampling, according to Teddie and Tashaskkori (2011), involves selecting certain units or cases based on specific purposes rather than randomly. They further argued that purposive sampling is used in inductive studies to gather detail and in-depth information or data with small number of participants to represent the target population in order to yield detailed information about the issue.

In the view of Teddie and Tashaskkori (2011), purposive sampling is used in inductive studies to gather detail and in-depth information or data with small number of participants to represent the target population in order to yield detailed information about the issues. The researcher purposively selected St. Augustine Colllege, Holy Child Senior High School, University Practice Senior High School, Christ the King Senior High School and Ghana National College. Moreover, 40 students and 20 teachers were purposively selected

from each school. In all, 200 students and 100 teachers were purposively selected for the study.

Instruments

Questionnaire was used as research instrument to collect data for the study. Closed and open1ended questions were included in the questionnaires1to enable1respondents1give their1views. Questionnaires1was expected1to enable the1researcher obtain1results within1a considerably1short time. The questionnaire was self-made. Amin (2005) and1Sarantakos (2012) confirm1the usefulness1of questionnaires1in terms of1their simplicity, time used1and easiness1for a researcher1to administer.

The instruments were checked for its validity and reliability before it was used on the field. The basis of the validity of a questionnaire is to ensure that the right questions are asked without creating any ambiguity. A drafted copy of the questionnaire was made available to my supervisor for face to face discussion and content validity.

Also, the Cronbach's Alpha value was checked to see the strength or weakness of the questionnaires. This ensured that the items in the questionnaire are related to the research questions and the objectives of the study. Statistical Product and Service Solutions (SPSS), version 21.0 was also used to check for the validity and reliability of the questionnaire questions for both teachers and students.

Data Collection Procedure

Before the administration of the final questionnaire, the instrument was first given to technocrats with adequate expertise on how to integrate ICT

resources in teaching and learning and on research in general to peruse and critique the questionnaire.

The coordinator of the Master of Education (Information Technology) at College of Distance Education, University of Cape Coast was contacted for a written letter of permission to conduct the study in the selected school.

The pilot study was carried out at Komenda Edina Eguafo Abrem (KEEA) district. The KEEA district was selected because the respondents had similar challenges to that of Cape Coast Metropolis. In all, 10 teachers and students were used for the pilot study which was based on simple random selection.

Before selecting the teachers, permission was sought from the district director of education in KEEA. This enabled planning to determine the suitable time and day to administer the final questionnaire. The Coordinator of the Master of Education (Information Technology) at College of Distance Education, University of Cape Coast was contacted for a written letter of permission to conduct the study in the selected senior high schools.

The reliability coefficient (Cronbach's alpha) informed the researcher as to whether the instrument is reliable or not. According to Kinash (2010), reliability coefficient of the instrument (questionnaire), measured in Cronbach's alpha value, provides basis to measure the internal consistency and trustworthiness of the items on the instrument. The Cronbach's alpha test was run to determine their reliability of the questionnaire which gave figure of 0.79, which was a reliable value.

To ensure the anonymity of the teachers, no identification was required from the respondents in answering the research instrument in the open-ended

and close-ended questions. The instruments were hand delivered to all the participants of the study. The data collection was completed within three weeks.

Ethical Considerations

Ethics refers to doing what is morally and legally right in the conducting of research. Research ethical consideration is important and researchers should protect the dignity of their subjects and publish well the information that is researched (Fouka & Mantzorou 2011). Some of ethical issues requiring consideration were length of time the interview took, statement indicating what happened to the information collected and statement about confidentiality and anonymity. The participants were assured that the data was used for academic purposes only. The research adhered to the ethical principles of the University of Cape Coast.

Data Analysis

Data analysis helps to manipulate the data obtained during the study in order to assess and evaluate the findings and arrive at some valid, reasonable, and relevant conclusions. After retrieving the questionnaires, time was spent to read through all of them and checked for completeness and consistency. The responded questionnaires were coded and subsequently inputted into a Statistical Package and Service Solutions (SPSS) version 21.0 templates that had been designed to be consistent with the research instrument.

The descriptive nature of the study made the researcher use descriptive statistical tools for the analysis of the data. Statistical tools like frequency distribution, percentages and cross tabulation were also be used to describe the

variables. The analyzed data were interpreted in relation to the research questions.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter deals with the data presentation and analysis. All data gathered for the study are organized and analyzed. This is followed by a discussion of key issues relating to the findings of the study.

Demographic Characteristics of Respondents

This section highlights the demographic characteristics of the respondents used in the study, which comprises bio-data of selected teachers and students in the various senior high schools. The demographic characteristics of the respondents helped in determining the extent to which the responses they provided could be depended upon. Out of 100 teachers and 200 students sampled for the study, 88 (88.0%) and 179 (89.5%) valid questionnaire was retrieved.

Table 1: *Gender of respondents*

Gender	Number of Teachers	Percent (%)	Number of Students	Percent (%)
Male	59	67.0	114	63.7
Female	29	33.0	65	36.3
Total	88	100.0	179	100.0

Source: Field survey (2018)

Table 1 indicates the gender of the respondents. They comprise of both teachers and students in selected Senior High Schools in the Cape Coast Metropolis. As indicted, 88 teachers and 179 students took part in the survey. Out of 88 teachers 59 were males (67.0%) and 29 were females (33.0%). This indicates that most teachers who took part in the survey were males. Also out

of 179 students who took part in the survey 114 were males (63.7%) while 65 were females (36.3%). Therefore, majority of the students who took part in the survey were males.

Table 2: *Age group of Students*

Ages	Frequency	Percentage (%)
11 -15 years	21	11.7
16 -19 years	158	88.3
Total	179	100.0

Source: Field survey (2018)

The age group of students is shown in the Table 2. It indicates that majority of the 179 students (88.3%) were in the 16-19-year group and just 11.7% of them aged between 11 and 15 years.

Table 3*:* *Age group of teachers*

Ages	Frequency	Percentage (%)
Under 25	1	1.1
26 -30	23	26.1
31-35	23	26.1
36-40	18	20.5
41-45	13	14.8
46-50	7	8.0
51-55	3	3.4
Total	88	100.0

Source: Field survey (2018)

Table 3 shows that the age groups of teachers who took part in the survey. Table 3 indicates that majority of the teachers were in the ages of 26 to 40 years. Only one person aged below 25 years and 23 of them were above 40 years with just 3 in the 51-55-year group.

Table 4: *Highest level of Education attained by teachers*

Academic Qualification	Frequency	Percent
1st Degree	60	68.2
Masters	28	31.8
Total	88	100.0

Source: Field survey (2018)

From Table 4, 60 (68.2%) teachers had first degrees as their highest level of education and 28 (31.8%) had masters degrees as their highest level of education. This therefore indicates that most teachers who took part in the survey were first-degree holders.

Table 5: *Number of years teachers had been teaching*

Years	Frequency	Percentage (%)
1-5	19	21.6
6-10	40	45.5
11-15	14	15.9
Above 15	15	17.0
Total	88	100.0

Source: Field survey (2018)

From Table 5, most teachers (40) captured in the survey had been teaching for 6-10 years making up 45.5 %. Twenty-nine (32.9%) of them had at least 11 years of teaching experience while 21.9% had taught for one to five years. Thus, majority of the teachers used in the study were experienced teaching their subjects.

Table 6: *Level at which teachers studied ICT*

Institution	Frequency	Percentage (%)
Training College	37	42.0
Polytechnic	4	4.5
University	39	44.3
None	8	9.1
Total	88	100.0

Source: Field survey (2018)

Table 6 presents the intuitions teachers attended. Most teachers, who took part in the survey, studied ICT at the university (44.3%) and training college (42.0%). Four studied ICT at the Polytechnic whereas the other (8) studied ICT studied the subject elsewhere.

Table 7*:* *Class of students*

Class	Frequency	Percentage (%)
SHS 3	96	53.6
SHS 2	83	46.4
Total	179	100.0

Source: Field survey (2018)

Table 7 presents the class of students used in this study. As shown in Table 7, out of the 179 students who took part in the survey, 96 were in SHS 3 comprising 53.6% whiles 83 (46.4%) were in SHS 2. Table 7 indicates that majority of the respondents were SHS 3 students.

Description of Main Results

Objective 1: Determine ICT resources available for use by students and teachers in the teaching-learning environment.

Table 8*: Availability of ICT resources for use in teaching and learning*

	Availability		Usage	
	Yes	No	Yes	No
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Personal Desktop/Laptop Computers	145 (81.0)	34 (19.0)	133 (74.3)	46 (25.7)
School Internet	116 (64.8)	63 (35.2)	71 (39.7)	108 (60.3)
Printer	137 (76.5)	42 (23.5)	54 (30.2)	125 (69.8)
Digital cameras	56 (31.3)	123 (68.7)	21 (11.7)	158 (88.3)
Technical support	95 (53.1)	84 (46.9)	77 (43.0)	102 (57.0)
Digital projectors	165 (92.2)	14 (7.8)	145 (81.0)	34 (19.0)
Adequate Classroom computers for students' use	48 (26.8)	131 (73.2)	43 (24.0)	136 (76.0)
Computers for students' use elsewhere (E.g. Computer lab)	136 (76.0)	43 (24.0)	129 (72.1)	50 (27.9)

Source: Field survey (2018)

Table 8 shows the ICT resources available for use in teaching and learning in the five selected senior high schools in the Cape Coast Metropolis. The analysis revealed that 81% and 74.3% of respondents, respectively, confirmed the availability and usage of personal computers (desktop and laptops). However, while 64.8% of respondents confirmed the availability of

Internet in their schools, 60.3% claimed they did not use the Internet provided at school. Also, 76.5% indicated the availability of a printer, but only 69.8% claimed it is not available for use. As high as 76% of the students indicated that they rather used computers elsewhere, such places as computer laboratories, other than those provided in the classroom. This implies that there are ICT resources available in the SHSs for teaching and learning.

Hypothesis 1

H_0: There is no statistically significant association between the availability and usage of ICT resources for both teachers and students.

Table 9: *Chi-Square Test for Availability and Usage of ICT resources for both teachers and students*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	205.177	1	0.000
N of Valid Cases	267		

Source: Field survey (2018)

Table 9 shows the Chi-Square test performed to ascertain the association between availability and usage of ICT resources for both teachers and students. The analysis showed that the value of the test statistic (Pearson Chi-Square) is 205.177 and the corresponding p-value of the test statistic is 0.000 ($p = 0.000$). Since the p-value is less than alpha level ($\alpha = 0.05$), the null hypothesis was rejected that there is no statistically significant association of the availability and usage of ICT resources for both teachers and students. This indicates that the usage of ICT resources depends on their availability. According to Apagu and Wakili (2015), inadequate availability of ICT resources in secondary schools leads to a low level of exposure to the use of

ICT resources. Therefore, to encourage the use of ICT facilities for teaching-learning activities, these facilities should be made available for both teachers and students to use.

Objective 2: Determine the attitude of senior high school teachers towards the use of ICT resources in teaching and learning

Table 10: *SHS teachers' attitude towards ICT use in teaching and learning*

	Yes Freq. (%)	No Freq. (%)
I am comfortable using ICT resources in the teaching-learning process	71 (80.7)	17 (19.3)
I enjoy using educational technology	77 (87.5)	11 (12.5)
Learning about educational technology and using them is a waste of time	19 (21.6)	69 (78.4)
I use ICT resources while teaching	73 (83.0)	15 (17.0)
I won't have anything to do with ICT	15 (17.0)	73 (83.0)
I think class time is too limited for educational technology use	9 (10.2)	79 (89.8)
Educational technology use suits my students' learning preferences and their level of educational technology knowledge	79 (89.8)	9 (10.2)
The state of ICT facilities discourages me from using ICT	70 (79.5)	18 (20.5)

Source: Field data (2018)

Hogg and Vaughan (2005) have argued that an attitude is a belief, feeling and behavioral tendencies towards an object, groups, events or

symbols. In Table 10, the attitudes of teachers towards the use of ICT resources in teaching are presented. Seventy one (80.7%) of teachers felt comfortable using ICT resources in teaching and learning process. Sixty nine (78.4%) maintained that learning about educational technology and using it is not a waste of time. This may be due to their experience with the use of computers as Kumar (2003) has indicated that teachers' level of experience with computers is one of the factors that enhance teachers' usage of ICT in their teaching. Only 17% of teachers said they didn't use ICT resources in teaching and that they wouldn't have anything to do with ICT in teaching. Similarly, 10.2% of the teachers were of the view that class time was too limited for educational technology use, whiles majority of them 89.8% were of the view that educational technology use suited their students learning preferences and their knowledge of educational technology knowledge. The state of ICT facilities discouraged 79.5% of the teachers from using ICT; thus, there is a positive relationship between the state of ICT and its use.

Hypothesis 2

H_0: There is no statistically significant association between SHS teachers' attitudes towards the use of ICT resources

Table 11: *Chi-Square Tests on SHS teachers' attitude towards the use of ICT resources in teaching*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.879	3	0.031
N of Valid Cases	88		

Table 11 shows the Chi-Square test performed to determine the association between SHS teachers attitude towards the use of ICT resources. The value of the test statistic (Pearson Chi-Square) is 8.879 and the corresponding p-value of the test statistic is 0.031 ($p = 0.031$). Since the p-value is lesser than alpha level ($\alpha = 0.05$), the null hypothesis was rejected. Therefore, there is a statistical significant association between SHS teachers' attitude and the use of ICT resources.

Objective 2: Determine the attitudes of senior high school students towards the use of ICT resources in teaching and learning

Table 12: *Attitudes of students towards the integration of ICT on teaching and learning*

	Yes	No
	Freq. (%)	Freq. (%)
I enjoy using the computer	167 (93.3)	12 (6.7)
I think it takes a long time when I use a computer	43 (24.0)	136 (76.0)
I focus much on the computer when I use one	166 (92.7)	13(7.3)
I know computers give me the chance to learn many new things	171 (95.5)	8 (4.5)
The state of facilities discourages me from using ICT	165 (92.2)	14 (7.8)

Source: Field data (2018)

From Table 12, 93.3% of the students who took part in the survey enjoyed using computers, whiles 6.7% of them did not. Again, 92.7%of the

students testified that they focused much on the computer when they use it. This finding is in agreement with George (2006) and Salminen-Karlsson (2007), who reported that students have positive attitudes towards the use of ICT in their learning.

Majority of the students (95.5%) indicated that the computer offered them the opportunity to learn many new things. The poor state of ICT facilities also discouraged the students (92.2%) from using computers. Students indicated that, broken down computers and slow Internet among other things discouraged them from using ICT facilities in learning.

Hypothesis 3

H_0: There is no statistically significant association between SHS students' attitude towards the use of ICT and the usage of ICT resources in learning.

Table 13*: Chi-Square Tests on SHS students' attitude towards the use of ICT resources in learning*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.449[a]	1	0.020
N of Valid Cases	179		

Table 13 shows the Chi-Square test performed to determine the association between SHS students' attitude towards the use of ICT resources in learning. The value of the test statistic (Pearson Chi-Square) was 5.449 and the corresponding p-value of the test statistic was 0.020 (p = 0.020). Since the p-value was less than alpha level (α = 0.05), the null hypothesis was therefore

rejected. This indicated that there was statistically significant ($p < 0.05$) association between SHS students' attitude towards the use of ICT resources in their learning and usage of these facilities in learning. Hence, a positive attitude towards usage of ICT in learning promotes the use of ICT facilities in learning. This finding supports the assertions by Jones (2000), George (2006) and Salminen-Karlsson (2007) that students have positive attitudes towards the use of ICT in their learning activities. Volk, Yip and Lo (2003) have argued that students' positive attitude towards ICT is due to the fact that the use of ICT improves the quality of teaching and learning process.

Objective 3: Identification of the key effects of ICT use on teaching and learning

Table 14*: Effects of ICT use in teaching and learning*

	SA Freq. (%)	A Freq. (%)	D Freq. (%)	SD Freq. (%)
Students feel more involved in the lesson	33 (37.5)	43(48.9)	7 (8.0)	5 (5.7)
Educational technology motivates students to do more study	31 (35.2)	45(51.1)	7 (8.0)	5 (5.7)
Promotes effective students' learning and improves students' performance	33 (44.3)	37(42.0)	5 (5.7)	7 (8.0)
It makes the subject matter more interesting	36 (40.9)	38(43.2)	6 (6.8)	8 (9.1)
Provision of a better learning	46 (52.3)	36(40.9)	4 (4.5)	2 (2.3)

experience				
It makes the lesson more real and practical rather than abstract	30 (34.1)	45(51.1)	7 (8.0)	6 (6.8)
It helps teachers in their lesson notes preparation	43 (48.9)	39(44.3)	4 (4.5)	2 (2.3)
It helps in faster access to information	41 (46.6)	42(47.7)	4 (4.5)	1 (1.1)

Source: Field data (2018)

Key: SA = Strongly agree, A = Agree, D = Disagree, SD = Strongly disagree.

In Table 14, 37.5% and 48.9% of teachers strongly agreed and agreed, respectively, that students felt more involved in the lesson when ICT was used in the teaching and learning process. Only 13.7% disagreed or strongly disagreed. Similarly, 86.3% of the students strongly agreed or agreed that the use of ICT in teaching and learning improves their performance. Papaioannou and Charalambous (2011) have argued that when ICT is integrated into classroom, students are able to access more information faster in an efficient manner, which enhances their understanding and, consequently, improves their performance.

Objective 4: Determination of the major obstacles militating against the use of ICT in teaching and learning

Table 15*: Major obstacles to the use of ICT tools in teaching and learning*

	Frequency	Percentage (%)
Lack of computers and Internet connection	65	73.9
Broken down computers	12	13.6
Lack of ICT teachers	5	5.7
Power connection (Poor state or lack of power supply)	5	5.7
Lack of institutional support for ICT	1	1.1
Total	88	100.0

Source: Field data (2018)

From Table 15, out of the 88 teachers who took part in the survey, 73.9% indicated that lack of computers and Internet connection affected teaching and learning. This finding confirms Pergrum (2016) report that lack of access to resources, including access to computers in classrooms, is one of the complex challenges that prevents teachers from integrating ICT into lesson delivery. Also 13.6% agreed that broken down computers was also a major obstacle, while 5.7% asserted that lack of ICT teachers militated against the use of ICT resources in teaching and learning. Power connection and availability was also indicated by some teachers (5.7%) as a major problem that stood against the proper use ICT facilities in teaching and learning. One of the teachers also indicated that lack of institutional support for ICT was one of the major obstacles of ICT use in teaching and learning.

Summary

In this chapter, the collected data were analyzed and interpreted in accordance with the research objectives. The major findings were that ICT resources were generally inadequate in senior high schools in the Cape Coast Metropolis. Teaching and learning was most effective with the availability of ICT resources as confirmed by both teacher and student respondents. The availability of ICT triggered motivation in teaching and learning.

Finally, lack of computers and Internet connection posed as the main obstacle among other factors preventing the use of ICT tools in teaching and learning.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents a summary of findings and conclusions drawn from the study.

Summary of the Study

The main purpose of this study was to assess the integration of ICT resources in teaching and learning in selected senior high schools in the Cape Coast Metropolis. The instrument used for the study was mainly questionnaire. Total samples of two hundred and seventy (270) respondents were part for the survey, comprising of ninety (90) senior secondary school teachers and one hundred and eighty (180) students, these samples were picked from five (5) selected senior secondary schools. However out of two hundred and seventy (270) questionnaire distributed, two hundred and sixty seven (267) questionnaires were retrieved, eighty eight (88) teachers and one hundred and seventy nine (179) students. The data was analysed into percentages, frequencies, and chi –square test, analysis using SPSS software.

The main research questions were:

1. What ICT resources were available for students and teachers in the teaching and learning activities in Cape Coast Metropolis?
2. What were the attitudes of senior high school teachers and students towards the use of technology in the delivery of lessons in Cape Coast Metropolis?
3. What were the key effects of ICT use on teaching and learning in Cape Coast Metropolis?

4. What were the major obstacles militating against the use of ICT in teaching and learning in Cape Coast Metropolis?

Major Findings

1. The results indicate that resources available for use in teaching and learning activities comprised of personal computers, laptops, internet printers and other accessories, however the usage of these resources depends on availability.
2. The attitude of teachers towards the use of ICT in teaching and learning depended on their background knowledge in ICT and experience in its use.
3. Most teachers used ICT in teaching and learning did so because they had some background knowledge and experience in the use of ICT.
4. Most students used the ICT resources because it was available and accessible.
5. From the study, introduction of ICT in teaching and learning improved the performance of students, it also makes subject matter more interesting and students get involved in the lesson.
6. The study revealed that lack of computers and its accessories, broken-down computers, printers, and lack of internet in schools were the major obstacles in teaching and learning. However most of the respondent who took part in the survey saw ICT in teaching and learning to be important.

Conclusions

The integration of ICT in senior secondary schools especially in the Cape Coast Metropolis is very crucial in the development of education in the region. However the current educational system is clouded with challenges such as: Lack of computers, poor internet connectivity and lack of a working framework on ICT policy for SHSs.

The integration of ICT in second cycle schools in Ghana demonstrates positive result for the future life of student in participating schools. The message coming from teachers and students from Cape Coast Metropolis is that for ICT to be effectively used in teaching and learning there should be adequate ICT facilities and equipment available to students, frequent workshops for teachers to polish their skills and update their knowledge in ICT use, to enable them to properly use it in their lesson delivery.

Recommendation

1. Based on the results of the findings that ICT facilities are inadequate or not available in senior secondary schools in the Cape Coast Metropolis, it is recommended that Government and other stakeholders should help to furnish senior high schools with adequate ICT facilities.
2. In-service training for teachers is very crucial. There should be regular ICT training of such programmes to update knowledge and skills of teachers in their lesson delivery.
3. Furthermore, second cycle schools should be networked so that necessary information could easily be shared among schools for students to personalize learning in and out of their schools.

4. Finally Institutions should insist and make it mandatory for teachers to use ICT in their lessen delivery. This can however be sustained by adequate financial and staff support if teachers are to use technology appropriately to promote learning for all students in their classrooms.

Suggestions for Further Research

The current study is limited in scope as it was conducted to cover only five (5) selected schools in the Cape Coast Metropolis. There is however the need to extend this study to cover a wider Geographical area probably the entire Central Region.

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APPENDIX A

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION

Questionnaire for Teachers

Thank you for accepting to complete this questionnaire. The purpose of this questionnaire is to assess the integration of ICT resources in teaching and learning in Senior High School in Cape Coast Metropolis. This is not a test and there are no wrong answers to any of the questions. You are assured that any information given is solely for academic purpose and your anonymity is guaranteed. ; Please try as much as possible to answer all questions.

Section A: Demographic Characteristics

1. Sex :

   Male [ ] Female [ ]

2. What is your highest level of education?

Ist Degree [ ]

Masters [ ]

Ph D [ ]

3. Which age group do you belong?

   A. below 25 years [ ]

   B. 26-30 years [ ]

   C. 31-35 years [ ]

   D. 40-49 years [ ]

   E. above 50 years [ ]

4. What is the name of your school? ……..

5. How long have you been teaching?

A. 1-5 years [ ]

B. 6-10 years [ ]

C. 11-15years [ ]

D, Above 15years [ ]

6. At which of the following stages did you study ICT?

A. Training College [ ]

B. Polytechnic [ ]

C. University [ ]

D. Other (specify) ……..

7. Please indicate whether you have undertaken professional development in any of the ICT areas listed below.

	ICT area	Have you undertaken it
(i)	use of computers/basic	Yes [ ] No [ ]
(ii)	Word processing (e.g. MS Word	Yes [ ] No [ ]
(iii)	Spreadsheets (e.g. Excel)	Yes [ ] No [ ]
(iv)	Presentation software (e.g. PowerPoint)	Yes [ ] No [ ]
(v)	Databases (e.g. Access)	Yes [ ] No [ ]
(vi)	Training on how to integrate technology within the curriculum	Yes [ ] No [ ]

8. List Other ICT training received

A ……

B ……

C……

9. During my training, the focus was on teachers acquiring basic ICT skills and not how to develop the pedagogical aspects of ICT

A. Strongly Agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

10. Do you use ICT devices in teaching your students?

A. Regularly (daily) [ ]

B. Occasionally (weekly) [ ]

C. Once a term [ ]

D. Not at all [ ]

11. Please indicate which of the ICT resources listed below are available for use at your school as a teacher and whether you have used them.

	ICT resource	Is it available	If so do you use it
I	Desktop/laptop computer for personal use	Yes [ ] NO [ ]	Yes [ ] No [ ]
II	Personal e-mail account	Yes [ ] No [ ]	Yes [ ] No [ ]
III	School intranet	Yes [ ] No [ ]	Yes [ ] No [ ]
IV	Internet	Yes [ ]	Yes [ ]

		No [ ]	No [ ]
V	Printer	Yes [ ] No [ ]	Yes [ ] No [ ]
VI	Digital cameras	Yes [ ] No [ ]	Yes [ ] No [ ]
VII	Technical support	Yes [ ] No [ ]	Yes [ ] No r]
VIII	Digital projectors	Yes [ ] No [ ]	Yes [ ] No [ ]
IX	Computers for students use in your classroom	Yes [ ] No[ ]	Yes [ ] No [ ]
X	Computers for students use elsewhere at school, (e.g. Computer lab)	Yes [ ] No [ ]	Yes [ ] No [ ]

12. I generally prefer to use ICT resources in teaching and learning

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

13. Where do you generally use ICT resources?

A. Classroom [ ]

B. Computer lab [ ]

C. Library [ ]

D. Home [ ]

E. Café [ ]

F. Other……..

14. To what extent are you incorporating ICT in your teaching to achieve the following?

	Students Activity	Daily	Weekly	Monthly	Never
I	Mastering skills just taught				
II	Remediation of skills not learned well				
III	Expressing themselves clearly				
IV	Communicating with other people				
V	Finding out about ideas and information				
VI	Analyzing information				
VII	Presenting information to an audience				
VIII	Improving computer skills				
IX	Learning to work collaboratively				

15. Other teachers have been integrating ICT in their teaching

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

16. Students learn better when ICT devices are employed in teaching

Strongly agree [ ]

Agree [ ]

Disagree [ ]

'Strongly disagree [ ]

17. Teachers need more ICT training

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

18. What are some challenges to effective ICT use in your school?

…….

……..

……..

……..

……

19. Most teachers are competent employing ICT in their teaching and learning

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly Disagree [ ]

20. The school authorities encourage teachers to pursue further courses in ICT.

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

21. The school authorities support the use of ICT by all teachers

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

22. The school authorities encourage the use of ICT by all teachers

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

23. The school is very supportive of ICT initiative

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

24. The school is very supportive of ICT purchase

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly agree [ ]

25. Teachers have been receiving regular ICT in service training

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly agree [ ]

26. Sufficient ICT resources are available to meet the ICT requirements of teachers and students.

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

27. More resources should be devoted to provision of ICT infrastructure.

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

THANK YOU FOR COMPLETING THIS QUESTIONAIRE

APPENDIX B

UNIVERSITY OF CAPE COAST

CENTER FOR CONTINUING EDUCATION

Questionnaire for students

Thank you for accepting to complete this questionnaire. The purpose of this questionnaire is to assess the integration of Information and Communication Technology Resources in teaching and learning in the senior High Schools in the Cape Coast Metropolis. This is not a test and there is no wrong answer to any of the questions. You are assured that any information given is solely for academic purposes and your anonymity is guaranteed. Please try as much as possible to answer all questions.

1) Your Gender

   A. Male [ ]

   B. Female [ ]

2) What is your highest level of education?

   A. SHS 3 [ ]

   B. SHS 2 [ ]

   C. SHS 1 [ ]

3) Which age group do you belong?

   A. Below 16 years [ ]

   B. 16-19 years [ ]

   C. Above 20 years [ ]

4) At which of the following stages do you study ICT

   D. Primary school Yes [ ] No [ ]

E. Junior High School Yes [ ] No [ ]

F. Senior High School Yes [ ] No [ ]

5) Please indicate whether you have received training in any of the ICT areas listed below.

	ICT training	Have you undertaken it
i.	Training in use of computers/basic	YES [ ] NO [ ]
ii.	Word processing (e.g. MS word)	YES [ ] NO [ ]
iii.	Spread sheet (e.g. Excel)	YES [ ] NO [ ]
iv.	Presentation software (e.g. Power point)	YES [ ] NO [ ]
v.	Databases (e.g. Access)	YES [ ] NO [ ]

6)

Other ICT received

A. ……..

B. ……....

C. …….

7) Do you use ICT devices in learning?

12. Regularly (daily) [ ]

13. Occasionally (weekly) [ ]

14. Once a term [ ]

15. Not at all [ ]

8) Please indicate which of the ICT resources listed below are available for use at your school.

	ICT resources	Is it available	**If so do you use it**
i.	Desktop/laptop computer for personal	YES [ ] NO [ ]	**YES [ ]** **NO [ ]**
ii.	Personal e-mail account	YES [ ] NO [ ]	YES [ ] NO [ ]
iii.	School internet	YES [ ] NO [ ]	YES [ ] NO [ ]
iv.	Internet	YES [ ] NO [ ]	YES [ ] NO [ ]
v.	Printer	YES [ ] NO [ ]	YES [ ] NO [ ]
vi.	Digital cameras	YES [ ] NO [ ]	YES [ ] NO [ ]
vii.	Technical support	YES [ ] NO [ ]	YES [ ] NO [ ]
viii.	Digital projectors	YES [ ] NO [ ]	YES [ ] NO [ ]
ix.	Computers for students use in your classroom	YES [ ] NO [ ]	YES [ ] NO [ ]
x.	Computers for students use elsewhere at school. (computer lap)	YES [ ] NO [ ]	YES [ ] NO [ ]

9) Where do you generally use ICT resources

G. Classroom [ ]

H. Computer lab [ ]

I. Library [ ]

J. Home [ ]

K. Café [ ]

L. Other (specify) ……

10) Teachers use ICT resources in their teaching and learning

E) Agree [ ]

F) Strongly agree [ ]

G) Disagree [ ]

H) Strongly disagree [ ]

11) How often do you use ICT to achieve the following?

		Daily	Weekly	Monthly	Never
i)	Mastering skills just learnt				
ii)	Remediation of skills not learned well				
iii)	Expressing yourselves clearly				
iv)	Communicating with other				

	people				
v)	Finding out about ideas and information				
vi)	Analyzing information				
vii)	Presenting information to an audience				
viii)	Improving computer skills				
ix)	Learning to work collaboratively				

12) Other teachers have been integrating ICT in their teaching

E) Strongly agree [ ]

F) Agree [ ]

G) Disagree [ ]

H) Strongly disagree [ ]

13) Students learnt better when ICT devices are employed in their teaching

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

14) Teachers are competent in use of ICT.

A. Strongly agree [ ]

B. Agree [ ]

C. Disagree [ ]

D. Strongly disagree [ ]

15) Teachers need more ICT training

E _Strongly agree [ ]

F) Agree [ ]

G) Disagree [ ]

H) Strongly disagree [ ]

16) What are some challenges to effective ICT use in your school?

……..

……...

…….

17) Most teachers are competent employing ICT in their teaching and learning.

E) Strongly agree [ ]

F) Agree [ ]

G) Disagree [ ]

H) Strongly disagree [ ]

18) The school authority supports the use of ICT by all teachers.

E) Strongly agree [ ]

F) Agree [ ]

G) Disagree [ ]

H) Strongly disagree [ ]

19) The school authorities encourage the use of ICT by all teachers.

E) Strongly agree [ ]

F) Agree [ ]

G) Disagree [ ]

H) Strongly [ ]

20) The school is very supportive of ICT initiatives

E) Strongly agree [ ]

F) Agree [ ]

H) Strongly disagree [ ]

21) The school is very supportive in of ICT purchases

E) Strongly agree [ ]

F) Agree [ ]

G) Disagree [ ]

H) Strongly disagree [ ]

I) No idea [ ]

22) Sufficient ICT resources are available to meet the ICT requirements of teachers and students.

A) Strongly agree [ ]

B) Agree [ ]

C) Disagree [ ]

D) Strongly disagree [ ]

23) More resources should be devoted to provision of ICT infrastructure

E) Agree [ ]

F) Strongly agree [ ]

G) Disagree

H) Strongly disagree [ ]

THANK YOU FOR YOUR COMPLETING THIS QUESTIONNAIRE