UNIVERSITY OF CAPE COAST

ASSESSMENT OF ICT UTILIZATION IN SENIOR HIGH SCHOOLS IN

ASIKUMA-ODOBEN-BRAKWA DISTRICT

ALBERT ATO JACKSON

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ASIKUMA-ODOBEN-BRAKWA DISTRICT

BY

ALBERT ATO JACKSON

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DECLARATION

Candidate's 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: ……………………

Name: Albert Ato Jackson

Supervisor's Declaration

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

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

Name: Prof. Paul Dela Ahiatrogah

ABSTRACT

This study examined the assessment of Information and Communications Technology (ICT) utilization in the Senior High Schools in Asikuma-Odoben-Brakwa District in the Central Region of Ghana. The Research Design employed for the study was descriptive survey.

The objectives for the study were to examine the availability, adequacy and accessibility of ICT facilities and services in the selected schools by students and teachers, find out the attitudes and perceptions of students towards ICT usage in teaching and learning environments and state the perceptions of teachers about the usage of ICT for teaching, professional development and personal use.

A total sample of 170 respondents took part in the survey that was made up of 120 students and 50 teachers. These samples were picked from five Senior High Schools, comprised of students and teachers: 60 males and 60 females were selected from the students; 12 females, and 38 males constituted the teachers' sample. Stratified random sampling technique was used to select the students while purposive sampling technique was used to select the teachers.

Questionnaire was used as the main instrument for data collection to arrive at an understanding of the phenomenon. Data collected were coded and analysed using SPSS software into frequency tables and simple percentages.

The main findings of the study were that; the availability, adequacy and accessibility of ICT facilities and services in the schools were inadequate

and very poor. Teachers and students skills of ICT use were restricted to application software. ICT is not being used as a pedagogical tool. Both teachers and students have very positive perceptions and attitudes about ICT and towards the usage of ICT in teaching and learning environment, and their personal use.

Recommendations such as provision of internet connectivity to schools without Internet facilities should be accelerated, organization of training, workshops and seminars should be done for teachers regularly to boost their knowledge base in ICT so that they would be motivated and confident to use ICT in their work.

Also, stakeholders in education; namely school management, government, teachers, students, Parents Teachers Associations (PTA) and Ghana Education Service were sensitized on the efficient utilization of ICT in the Senior High Schools in Asikuma-Odoben-Brakwa District.

ACKNOWLEDGEMENTS

DEDICATION

To My Family, and

In memory of My Father and Mother

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CHAPTER ONE

INTRODUCTION

Background to the Study

Information and Communications Technology (ICT) is transforming the world at a very fast pace and its impact on socio-economic activities cannot be overemphasized. According to Daniels (2002), ICT has become, within a very short time, one of the basic building blocks of modern society. Many countries now appreciate ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. However, there appears to be a misconception that ICT generally refers to 'computers and computing related activities'. This is unfortunately not the case, although computers and their application play significant role in modern information management, other technologies and/or systems which comprise the phenomenon that is commonly regarded as ICT.

Pelgrum and Law (2003) stated that near the end of the 1980s, the term 'computers' was replaced by 'IT' (Information Technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term 'ICT' (Information and Communications Technology) around 1992, when e-mail started to become available to the general public (Pelgrum, & Law, 2003).

Adeya (2002) in a United Nations Economic Commission (ECA) report, states that ICT covers Internet service provision, telecommunications equipment and services, information technology equipment and services,

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media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services and other related information and communication activities.

According to UNESCO (2002), Information and Communications Technology (ICT) may be regarded as the combination of 'Information Technology' with other related technology, specifically Communications Technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audiocassettes and CD ROMs etc. have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya & Sharma, 2007).

The field of education has been affected by ICT, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICT have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis & Tearle, 1999; Lemke & Coughlin, 1998; cited by Yusuf, 2005).

As Jhurree (2005) stated, much has been said and reported about the impact of technology, especially computers, in education. Initially, computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Computers and applications of

technology became more pervasive in society which led to a concern about the need for computing skills in everyday life. Hepp, Hinostroza, Laval and Rehbein (2004) claimed in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICT have been utilized in education ever since their inception, but they have not always been massively present.

Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICT (Pelgrum, & Law, 2003).

The 1990s was the decade of computer communications and information access, particularly with the popularity and accessibility of internet-based services such as electronic mail and the World Wide Web (WWW). At the same time, the CD-ROM became the standard for distributing packaged software (replacing the floppy disk). As a result educators became more focused on the use of the technology to improve students' learning as a rationale for investment. Any discussion about the use of computer systems in schools is built upon an understanding of the link between schools, learning and computer technology.

When the potential use of computers in schools was first mooted, the predominant conception was that students would be 'taught' by computers (Mevarech & Light, 1992). That was so thought, because it was considered that the computer would 'take over' the teacher's job in much the same way as a robot computer may take over a welder's job. Collis (2001) referred to this as "a rather grim image" where "a small child sits alone with a computer".

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However, the use of Information and Communications Technology in the educative process has been divided into two broad categories: ICT for Education and ICT in Education. ICT for education refers to the development of Information and Communications Technology specifically for teaching and learning purposes, while the ICT in education involves the adoption of general components of information and communication technologies in the teaching and learning process.

Educational systems around the world are under increasing pressure to use ICT to teach students, the knowledge they need in the 21st century and beyond. The challenge is whether the benefits of ICT would commensurate the cost, because most developing countries are now spending a lot of the taxpayers money on ICT for teaching and learning without considering setting up criteria, standards, norm or conditions that could be used in evaluating the performances of ICT in teaching and learning. Hawkins (2002) posited that while many educational ministries around the world have made the commitment to computerise schools, few have developed coherent strategies to integrate its use fully as a pedagogical tool in the classroom.

The New Partnership for African Development (NEPAD), recognizing the importance of ICT in development, decided to make ICT a major component on its agenda in 2005 because it considered ICT as essential to the achievement of long-term, sustainable socio-economic development. The NEPAD e-Africa Commission (eAC) was then tasked as the coordinating organization responsible for developing and implementing ICT projects, one of which is the NEPAD e-Schools Initiative. NEPAD e-Schools initiative was to:

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- Teach ICT skills to young Africans in primary and secondary schools.

- Improve the provision of education in schools through ICT applications and the use of the Internet.

Over the years, various governments of Ghana, realizing the importance of ICT, have initiated a number of ICT oriented programs and reforms to effectively deploy ICT into teaching and learning. The Ghana ICT4AD policy document stipulates among other things:

1   To develop Ghana's information and knowledge-based society and economy through the widespread development, deployment, and exploitation of ICT within the society and economy.

2   To transform the educational system to provide the requisite educational, training services, and environment capable of producing the right types of skills and human resources required for developing and driving Ghana's information and knowledge-based economy and society.

3   To develop Ghana's research and development (R&D) capacity and capabilities with the potential to conduct, engage in advanced and cutting-edge research.

4   To development work required for supporting the development of local globally competitive information, knowledge-base and high-tech export industry and services sector as well as a modernized and competitive agricultural sector.

The formulations of the ICT for accelerated development also took into account the aspirations and the provisions of key socio-economic development framework documents such as Ghana's vision 2020 - the First Step; the

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Ghana Poverty Reduction Strategy (GPRS) 2002 -2004; and the Co-ordinated Programme for Economic and Social Development of Ghana (2003 -2012).

To achieve these objectives, the government of Ghana is putting a lot of emphasis on modernizing the educational system using ICT to improve and expand access to education, training, research resources and facilities. It would also improve the quality of education and training; make the educational system responsive to the needs, requirements of the economy and the society with specific reference to the development of an information and knowledge-based economy/society.

The Government of Ghana, through the new Educational Reform Programme, has introduced ICT as a course at all levels of the educational system in the country; including Basic Schools, Junior and Senior High Schools, Colleges of Education, Polytechnics and the Universities. In the Senior High Schools, ICT is being offered as a core subject. The importance of teaching and learning ICT in the Senior High Schools is designed to help students to acquire the knowledge for the application of ICT in education and business. Also, the study of ICT in the Senior High Schools would help students to access and share information through the internet. Furthermore, the introduction of ICT as a course would enable students to acquire the basic skills in ICT literacy, follow the basic ethics in the use of computers and use the internet to communicate effectively.

It is against this background that the government of Ghana and other stakeholders in education are drawing attention to the study of ICT as a tool for national development. The Senior High Schools in Asikuma-Odoben-Brakwa District in the Central Region of Ghana namely; Breman Asikuma

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Senior High and Odoben Senior High Schools are public owned, Brakwa Senior High Technical School, Best Brain Senior High Technical School and Trinity Senior High school are privately owned have benefited from the ICT infrastructure currently going on in the Senior High Schools.

Statement of the Problem

Although some modest achievements have been chalked so far as the development of ICT infrastructure is concerned, what is yet to be measured is the extent to which these facilities are being utilized by students, teachers and administrators for their work at the Senior High Schools in Asikuma-Odoben-Brakwa District.

Also, there seems to be no attempt to integrate ICT 'tools' in teaching and learning in some of the Senior High Schools; although various studies of the effectiveness of computing as an instructional tool indicate, it brings varied but general positive results.

Bell (2003) hinted that there have been some impressive successes in many places where computers are being used to help people learn Mathematics. He said that during the period of 1965 to 1975 many students, Mathematics teachers, curriculum developers and researchers successfully used computers to enhance teaching and learning in many different ways.

Moreover, it appears the availability and uses of ICT in some of these schools are low. Students, Teachers and administrators only use ICT for some few applications, despite ICT immense potentials. There is also little or no documentation on what is available. Currently, there is no information on the utilization of the ICT facilities, thus necessitating the need for this study. This

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goes to support what Gatechew (2001) wrote in his article on the access and utilisation of ICT. He emphasised that, making sound investment decisions about ICT is a major challenge facing educational policy planners because the information needed to make appropriate decisions on the use of ICT in education are limited. (Bates, 1995; Romiszowiski, 1998; Sparks 1989) cited in Getachew (2001).

In view of the increase in students' enrolment as far as the Computer Selection and Placement System is concerned which may put pressure on the ICT infrastructure, there is the need to evaluate and assess the ICT utilization in these Schools to enable the researcher to ascertain their ICT status so that remedial measures can be put in place.

It was against this backdrop that the researcher wanted to undertake this study to find out how the ICT facilities in the Senior High Schools in Asikuma-Odoben-Brakwa District are utilized by students, ICT laboratory assistants and teachers

Purpose of the Study

The purpose of this study is to assess the ICT utilization in the Senior High Schools to enhance learning, improve teaching methods as well as the management of the institutions in general.

Objectives of the Study

The specific objectives of the study are to;

1. Examine the adequacy of ICT facilities and services in the schools

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2. Identify the accessibility of ICT facilities and services by students and teachers

3. Find out the attitudes and perceptions of students towards ICT usage in teaching and learning environment

4. Establish the perceptions of teachers about the usage of ICT for teaching, professional development and personal use

5. Identify ways of promoting and integrating the effective use of ICT in teaching and learning environment.

Research Questions

In pursuance of the study, answers were sought for the following research questions:

1. What is the degree of availability of ICT facilities and services in the Senior High Schools in Asikuma-Odoben-Brakwa District?

2. What is the degree of adequacy of ICT facilities and services in the Senior High Schools in Asikuma-Odoben-Brakwa District?

3. To what extent are students and teachers able to have easy access to ICT facilities in their schools?

4. What are the attitudes of students towards ICT usage in teaching and learning environment?

5. What are the perceptions of students towards ICT usage in teaching and learning environment?

6. What are the teachers' perceptions about the ICT for teaching, and personal use?

7. How often do teachers use ICT for teaching and personal use?

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8. In what ways would you promote and integrate the effective use of ICT in teaching and learning environment?

Significance of the Study

The study would help to identify current ICT usage and set goals for the future as part of the institutions' strategic planning. Such findings can be used to set benchmarks and goals which can be useful to the management of the Senior High Schools.

Also, it would provide a guide for these schools to conduct a self-assessment of their general capacity to use ICT effectively to enhance teaching, promote learning and manage the institution. Furthermore, it would inform students and teachers about their readiness to use ICT to promote teaching and learning in their schools.

Moreover, teachers' experiences of using ICT would shed light on proper integration of ICT in teaching and learning, and in turn, these experiences would help to determine teachers' professional development needs for proper ICT integration in the classrooms environment.

Last but not least, it is intended that this work would serve as a starting point for the recognition of the need to regularly and critically assess ICT infrastructure and usage in these schools. Other researchers with similar interest or related topics would find this work relevant and as a basis for further research.

Delimitation of the Study

This study confined itself to the utilization of ICT in the Senior High

Schools in Asikuma-Odoben-Brakwa District and its impact on teaching and learning environment. Asikuma-Odoben-Brakwa District was chosen because of its deprived nature and besides, it is among the least developed District in terms of educational infrastructure which ICT is not an exception. By this study, most problems in the use of ICT in teaching and learning could be identified and addressed.

The scope of the study would identify the availability, adequacy of ICT facilities, attitudes and perceptions of students and teachers about the utilization of ICT in the schools. Core areas like teaching and learning would be the locus of the research to the exclusion of service areas like, the management of the institutions, Sick Bays, various houses and dormitories, among others would not be covered. It was considered inappropriate to cover all these areas in the study due to lack of resources such as time and logistics. This was also done to make the research feasible.

Limitation of the study

Leedy and Ormrod (2001) points out that during the research process, the researcher cannot avoid having data contaminated by bias of one sort or another. It is however unethical and unprofessional to fail to acknowledge the possibility of such limitations.

In the first place, related literature on the research was difficult to come across the reason being that not much research has been carried out on this or related topics. Also, the general outcome of this research finding would be limited to the Senior High Schools in Asikuma-Odoben-Brakwa District only instead of the entire Senior High Schools in the Central Region of

Ghana. The reason for chosen only schools in Asikuma-Odoben-Brakwa District was to draw the research finding nearer to a fair representation of what pertains to the schools in the District as a whole.

Finally, the study relied on feedback from students, teachers, school administrators and Computer laboratory Technicians. Data for the study were based on memory recall and opinions of respondents and this constitutes a limitation

Definition of Terms

ICT: Information and Communications Technology

NEPAD: New Partnership for Africa's Development

E-School: Electronic-School

ICT4AD: Information and Communication Technology for Accelerated Development

ICT4E: Information and Communications Technology for Education

WWW: World Wide Web

E-Commence: Electronic-Commerce

E-Governance: Electronic-Governance

EFA: Education for All

UNESCO: United Nation Education, Social and Cultural Organizations

OECD: Organization for Economic cooperation and Development

UNICEF: United Nations Children Fund

GPRS: Ghana Poverty Reduction Strategy

IJLIS: International Journal of Library and Information Science

Organization of the study

The first chapter presents the background to the study, the statement of the problem, purpose and significance of the study. It also includes research questions which guided the study, limitations and delimitation of the study and definition of terms.

The chapter two deals with the review of related literature to the study, views of author on issues like what is Information and Communications Technology, the need for ICT and the relevance of ICT in education. It also includes the effective use of ICT in teaching and learning process, teachers and students use of ICT, theoretical framework and empirical review of the study.

The third chapter talks about the methodology. This section deals with description of the research design, the population, the sample as well as the sampling procedure of the study. It also discusses the research instruments used, the data collection procedure and data analysis of the study.

The Chapter four presents the results and discussion of the findings of the study.

The chapter five which is the final chapter deals with the summary, key findings, conclusions and recommendations for the study as well as the suggestions for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to undertake both theoretical and empirical review of literature that is related to the topic. It is organized under the following headings:

1. Definition of Information and Communications Technology

2. The need for ICT in Education

3. Relevance of ICT in Senior High School Institutions.

4. Effective use of ICT in the teaching learning process

5. Theoretical framework and empirical reviews

6. Teachers and Students use of Information and Communication Technology (ICT)

Definition of Information and Communications Technology (ICT)

ICT is an acronym which stands for Information and Communications Technology. Information and Communications Technology (ICT) is a combination of two related subjects, Information Technology (IT) and Communications Technology (CT) Information Technology (IT) is the term used to describe the equipment and software elements that allow individuals to access, retrieve, store, organise, manipulate and present information by electronic means. Communication Technology (CT) is the term used to describe equipment, infrastructure and software through which information can be received and accessed. For example phones, faxes, modems, digital

networks and DSL lines (Murray, 2011). ICT is then the result of the convergence of IT and CT technologies. The phrase ICT had been used by academic researchers since the 1980s, but it became popular after it was used in 1997 in a report to the UK government by Dennis Stevenson in the revised National Curriculum for England, Wales and Northern Ireland in 2000 (Tamilselvan, Sivakumar and Sevukan, 2012) found that "International Journal of Library and Information Science, [IJLIS]".

There is not a universally accepted definition of ICT. Why? Because the concepts, methods and applications involved in ICT are constantly evolving almost on a daily basis. It is difficult to keep up with the changes - they happen so fast.

However, ICT has been defined in various ways by many authors and organizations. Brian and Sawyer (2003) defined ICT as "Technology that merges computing with high speed communication links carrying data, sound and video." Examples of ICT tools include computer, telephones, television, projectors, camera, mobile phones, fax machine and others.

The Association of African Universities (2000, p.3) defined ICT as a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyse, create, exchange and use data, information and knowledge in ways that, until recently, were unimaginable. It refers to the infrastructure that brings people together in different places and time zones, with multimedia tools for data, information, and knowledge management in order to expand the range of human capabilities (Heeks, 2000).

Wilson (2008) also defined ICT as the application of practical scientific tool to collect data, process or manipulate, store, transfer data, output Information and communicating information. A good way to think about ICT is to consider all the uses of digital technology that already exist to help individuals, institutions, businesses and organizations use of information.

The need for Information and Communications Technology in education

The Organisation for Economic Cooperation and Development (OECD, 2001) and Rao (2004) made the point that the ubiquitousness and utility of Information and Communications Technology is changing the way people live, learn, work and relate to each other. The explosion and free flow of information and ideas has brought knowledge and its applications to many millions of people, creating new choices and opportunities in some of the vital realms of human endeavour. These developments have created what scholars refer to as the knowledge society or learning society or information society.

From this viewpoint, the global economy is now based on the exploitation of knowledge in addition to labour and natural resources. Innovations are driven by the optimal use of information and information products. To be productive and competitive in the knowledge economy, governments must focus on strategies to provide quality education. Quality education is to impart skills that would serve as a tool for productivity.

Hawkins (2002) wrote of this skill as "information reasoning" which he posits as a process in which reliable resources of information are identified, effectively accessed, understood, contextualized and

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communicated to colleagues. He further pointed out that employers require workers who possess skills necessary to collaborate, engage in teamwork, and be able to share information across global networks. These workers must also have the ability to learn quickly in a rapidly changing environment. This skill could be gained by providing Information and Communications Technology resources to all including those who have no access.

This view was endorsed by the former President of South Africa, Nelson Mandela (2000) who was purported to have said that the universal access to information is a means to promote economic growth and development, consolidate democracy and human rights, and increase the capacity of ordinary people to participate in governance. Therefore, it is imperative for a society to reconsider the way skills are developed so that such society can benefit from the use and harnessing Information and Communications Technology (ICT) resources.

The Organisation for Economic Cooperation and Development (OECD, 2001) noted all countries wish to enhance the quality and effectiveness of the learning process in schools and are looking to Information and Communications Technology as the means whereby this may be achieved. UNESCO (2002) also pointed out that: All governments aim at providing the most comprehensive education possible for their citizens within the constraints of available finance. Because of the pivotal position of Information and Communications Technology (ICT) in modern societies, its introduction into education will be high on any political agenda.

Kante and Savani (2003) have stated that the use of e-learning can reduce the cost of face to face training, time of training, expand educational

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opportunities and develop knowledge-economy skills which are increasingly demanded in the labour market. Fletcher (2003) also noted that technology-based instruction can reduce time and cost needed for learning. Haddad (2003) supported the cost effectiveness of Information and Communications Technology in education by pointing out that "Information and Communications Technology (ICT), although expensive, may end up to be the best investment to make, because it is the most acceptable level of learning affordable for all students, anywhere, within reasonable time and resources".

From the points made by the aforementioned authors, it is evident that the use of Information and Communications Technology (ICT) in education has the potential promise for cost reduction and for an improvement of training and quality of service.

The need to adopt Information and Communications Technology (ICT) in schools is summarized into three rationales and these are:

- Economic rationale - to meet the requirements for employability as the 21st century unfold.

- Social rationale - to fulfil the requisite for participation in society and the work place, and

- Pedagogical rationale - to concentrate on the role of teaching and learning. (OECD, 2001).

It must however, be pointed out that the use of Information and Communications Technology (ICT) in education has some drawbacks. Cawthera (2001) has argued that there is no research to prove that the application of Information and Communications Technology (ICT) in education will be more successful than other resources such as "textbooks,

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teacher training or nutritional supplements". A similar assertion has been made by Fletcher (2003) who pointed out that the arguments in favour of technology-based instruction are incomplete. In spite of these apprehensions, education cannot ignore the changes wrought in society by the proliferation of Information and Communications Technology (ICT).

The contention here, however, is that the ultimate aim of the introduction of Information and Communications Technology (ICT) in schools will prove more rewarding than sticking to the traditional method of teaching and learning. This does not rule out the need for good planning for harnessing the potential of Information and Communications Technology (ICT) in teaching and learning.

Relevance of Information and Communications Technology (ICT) in Senior High Schools

The relevance of Information and Communications Technology in second cycle institutions cannot be underestimated as it serves as tools to enhance teaching, learning, research and the management of these institutions. This assertion is echoed by Adubifa (2001) that "the use of ICT in education would continue to grow and recent advances are likely to increase their range and application dramatically"(p. 1). Adubifa further indicated that;

> access to these tools thus become a matter of critical
> importance for any African school, that seeks to become
> viable and effective in training its students, producing
> and disseminating knowledge, and preparing the next
> generation of citizens with adequate skills. (pp. 1-2)

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Given the fact that ICT has tools for repository of books, communication, teaching and learning, maintenance of students' records and personnel and financial records, among others, it is an indispensable tool in the educational enterprise. It is, therefore, not surprising when the University of Michigan President's information revolution commission report (2005) indicated that the traditional ways of doing things in the schools by way of teaching, learning, research, library and the management of these schools are all gradually giving way to computer-based approaches.

The influx of online teaching and learning materials, CD ROM based academic materials, and software to manage students' records are all cases in point. Also, not only are these innovations necessary to facilitate the management of these schools, but they are also required to make students fit well into any employable pool capable of moving their country's economy forward.

The policy statement for the realization of the vision to transform Ghana into an information-rich, knowledge-based society and economy through the development, deployment and exploitation of ICT within the economy and society did not mince words about the importance of ICT in education. It indicated that "the government is committed to a comprehensive programme of rapid deployment, utilization and exploitation of ICT within the educational system from primary school upwards". (The Ghana ICT for Accelerated Development Policy, 2003, p. 32).

The policy statement further specified that to this end, the government, the key implementation agencies, players and stakeholders have come out with pragmatic objectives, strategies, policy measures, instruments and initiatives

for the realization of its mission. The importance and applications of ICT tools at any level of education cannot be over emphasized. It is also to a large extent a measure or yardstick of an institutions maturity.

Effective use of Information and Communications Technology (ICT) in Teaching and Learning process

The field of education has been affected by Information and Communications Technology (ICT), which has undoubtedly affected teaching, learning and research (Yusuf, 2005). ICT has the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis & Tearle, 1999; Lemke & Coughlin, 1998; cited by Yusuf, 2005). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must include Information and Communications Technology (ICT) in the global village

According to Cabero (2001), "the flexibilization time-space accounted for by the integration of ICT into teaching and learning processes contributes to increase the interaction and reception of information. Such possibilities suggest changes in the communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favour both individual and collaborative learning". The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICT, by its very nature is a tool that encourages and supports independent learning. Students using ICT for learning purposes become immersed in the process of learning as more and

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more students use computers as information sources and cognitive tools (Reeves & Jonassen, 1996). The influence of the technology in supporting how students learn would continue to increase. In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome.

As mentioned previously, any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ ICT in their learning processes, the more pronounced the impact of this would become. Teachers generate meaningful and engage learning experiences for their students, strategically using ICT to enhance learning. Students enjoy learning, and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21st century skills which they would need in their future lives.

The effective use of Information and Communications Technology (ICT) for education with regard to the teaching and learning process includes; the quality and accessibility of education, enhancement of the learning environment, motivates learning and enhances scholastic performance.

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ICT for the enhancement of quality and accessibility of education

Information and Communication Technology (ICT) increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner-driven and not teacher-driven. This in turn would better prepare the learners for lifelong learning as well as to

improve the quality of learning. In concert with geographical flexibility, technology-facilitated educational programs also remove many of the temporal constraints that face learners with special needs (Stephenson, 2001). Students are starting to appreciate the capability to undertake education anywhere, anytime and at anyplace.

One of the most vital contributions of ICT in the field of education is easy access to learning. With the help of ICT, students can now browse through e-books, sample examination papers for years etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002).

Wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. ICT also allows the academic institutions to reach disadvantaged groups and new international educational markets. As well as learning at any time, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to their advantage.

Mobile technologies and seamless communication technologies support 24x7 teaching and learning. Choosing how much time would be used within the 24x7 envelope and what periods of time are challenges that would face the educators of the future (Young, 2002). Therefore, ICT enabled education would ultimately lead to the democratization of education especially

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in developing countries like Ghana; effective use of ICT for the purpose of education has the potential to bridge the digital divide.

It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn (Yuen, Law & Wong, 2003).

ICT for the Enhancement of the learning Environment

ICT presents an entirely new learning environment for students, thus requiring a different skill set to be successful. Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through (New Media Consortium, 2007). ICT is changing processes of teaching and learning by adding elements of vitality to learning environments including virtual environments. ICT is a powerful tool for offering educational opportunities. It is difficult and maybe even impossible to imagine future learning environments that are not supported in one way or another, by Information and Communications Technologies (ICT).

ICT provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments. ICT may also make complex processes easier to understand through simulations that, again, contribute to authentic learning environments. Thus, ICT may function as a facilitator of active learning and higher-order thinking

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(Newhouse, 2002). Furthermore, ICT may serve as a tool to curriculum differentiation, providing opportunities for adapting the learning content and tasks to the needs and capabilities of each individual pupil by providing tailored feedback (Mooij & Smeets, 2001).

As Niederhauser and Stoddart (2001) pointed out, ICT may fit into a spectrum of instructional approaches, varying from traditional to innovation. Another aspect which may of course influence the use of ICT is access to technology (Kennewell, Parkinson, & Tanner, 2000). This refers not only to the number of computers, but also to the placement of the equipment, e.g. in the classroom or in a computer room. Kennewell, Parkinson & Tanner (2000) feel it is essential that computers be placed in the classroom, in order to maximize the opportunities for curriculum activity.

ICT environment improves the experience of the students and teachers and to use intensively the learning time for better results. The ICT environment has been developed by using different software and also the extended experience in developing web based and multimedia materials. ICT has an important role to play in changing and modernizing educational systems and ways of learning.

ICT Motivates Learning

ICT can enhance the quality of education in several ways, by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training. ICT is also a transformational tool which, when used appropriately, can promote the shift to a learner centered environment. ICT, especially computers and Internet

technologies, enable new ways of teaching and learning rather than simply allowing teachers and students to do what they have done before in a better way. ICT has an impact not only on what students should learn, but it also plays a major role on how students should learn. Along with a shift of curricula from "content-centered" to "competence-based", the mode of curricula delivery has now shifted from "teacher centered" form of delivery to "student-centered" form of delivery.

ICT provides motivation to Learn. ICT such as videos, television and multimedia computer software that combine text, sound, and colourful moving images can be used to provide challenging and authentic contents that would engage the student in the learning process. Interactive radio also makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become more involved in the lessons being delivered.

Some parents of the respondents opined that their children were feeling more motivated than before in such type of teaching in the classroom rather than the stereotype 45 minutes lecture. They were of the view that this type of learning process is much more effective than the monotonous monologue classroom situation where the teacher just lectures from a raised platform and the students just listen to the teacher.

Learning approaches using contemporary ICT provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (Berge 1998). Teachers could make their lecture more attractive and lively by using multi-media and on the other hand,

students were able to capture the lessons taught to them easily. As they found the class very interesting, the teachings also retained in their mind for a longer span which supported them during the time of examination.

ICT Enhances Scholastic Performance

Based on the extensive usage of ICT in education, the need appears to unravel the myth that surrounds the use of information and communications technology (ICT) as an aid to teaching and learning, and the impact it has on students' academic performance. ICT is said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality.

However, the experience of introducing different ICT in the classroom and other educational settings all over the world has for the past several decades suggested full realization of the potential educational benefits of ICT. The direct link between ICT use and students' academic performance has been the focus of extensive literature during the last two decades. ICT helps students in their learning by improving the communication between them and their instructors (Valasidou & Bousiou, 2005).

The analysis of the effects of the methodological and technological innovations on the students' attitude towards the learning process and on students' performance seem to be evolving towards a consensus, according to which an appropriate use of digital technologies in education can have significant positive effects on both students' attitude and their achievement. Research has shown that the appropriate use of ICT can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century.

Kulik (2003) revealed in his meta-analysis study that, on average, students who used ICT-based instruction scored higher than students without computers. The students also learned more in less time and liked their classes more when ICT-based instruction was included.

Fuchs and Woessman (2004) used international data from the Programme for International Student Assessment (PISA), which showed that while the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive, however, the correlation becomes less and insignificant when other student environmental characteristics are taken into consideration.

Attwell and Battle (1999) examined the relationship between having a home computer and school performance, their findings suggested that students who have access to a computer at home for educational purposes, have improved scores in reading and Mathematics. Becker (2000) found that Information and Communications Technology (ICT) increases students engagement, which leads to an increased amount of time students spend working outside class. Coates, Humphreys and Kane (2004) showed that students in on-campus courses usually score better than their online counterparts, but this difference is not significant here. ICT, especially computers and Internet technologies, enables new ways of teaching and learning in a better way rather than simply allow teachers and students to do what they have done before.

ICT has the potential for increasing access to and improving the relevance and quality of education. The use of ICT in educational settings, by itself, acts as a catalyst for change in this domain. Students using ICT for

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learning purposes become immersed in the process of learning as more and more students use computers as information sources and cognitive tools (Newhouse, 2002).

Theoretical Framework

According to Cox, Preston and Cox (1999), there are a number of factors which have been identified which might influence, support teachers and students in using ICT in the teaching and learning environment. In order to investigate these factors further in relation to teachers' and students ICT use, this study made use of the Technology Acceptance Model (TAM) developed by Davis, Bagozzi and Warshaw (1989).

It is an adaptation of the theory of reasoned action by Ajzen and Fisbein (1980) to investigate the reason why teachers and students use ICT. Their model, shown in Figure 1, links the perceived usefulness and perceived ease of use with attitude towards using ICT and actual use. They tested this model with 107 adult users, who have been using a managerial system for 14 weeks. They found that students and teachers' computer use was predicted by their intentions to use it and perceived usefulness were also strongly linked to these intentions.

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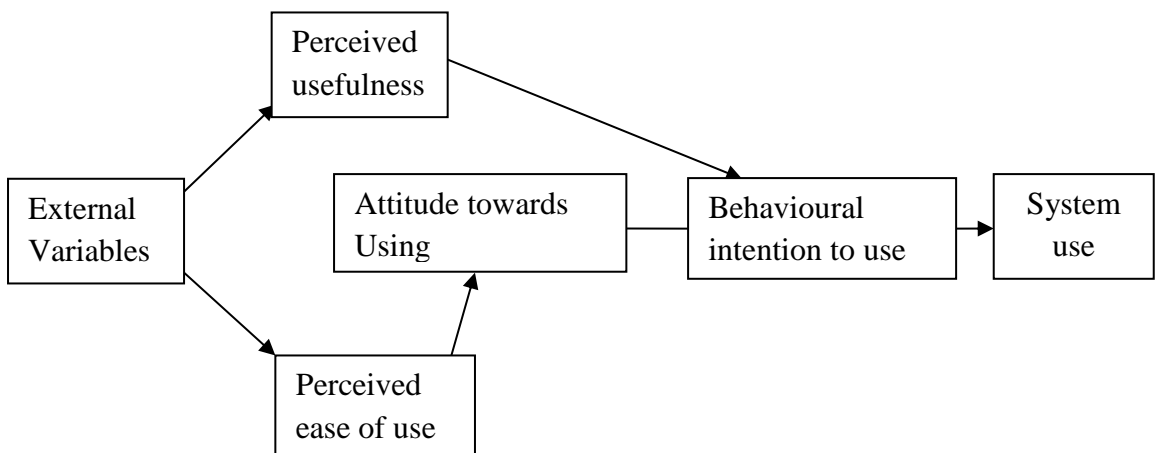
Figure 1: Technology Acceptance model (Davis)

In the Technology Acceptance Model (TAM), the external variables represent the many influences on teachers and students that come from outside their sphere of control. These include the requirements of a national curriculum or national guidelines; the changes in society with the rapid growth in the use of internet and ICT in general; school policies on using ICT; opinions of colleagues; responsibilities of teachers; pressure from parents and students and the influence of local education authority.

Although these have been identified as very important by a number of research studies in leading teachers to understand the need for change and question their professional practice as discussed earlier, only a few could be investigated within the scope of this study. The main focus of the study of this research is how teachers perceive ICT as a factor that contributes to teaching and learning. These factors come within the perceived usefulness and perceived ease of use components propounded by Davis, Bagozzi & Warshaw. (1989).

Perceived usefulness and perceived ease of use are two primary determinants of technology acceptance. Attitude towards technology use is jointly by determined perceived usefulness and perceived ease of use. The latter influences the behavioral intention to use the technology that-in turn-determines the actual adoption and use of technology (Venkatesh & Davis, 2000). External variables (e.g., system characteristics, development process, and training) on intention to use are mediated by the former internal processes (Venkatesh & Davis, 2000).

Teachers and Students use of ICT

Previous studies into teachers and students use of ICT have identified staff development as one of the contributing factors in using ICT effectively in the classroom. McCarney (2004) gave a report on an investigation into effective staff development in ICT for teachers. A sample of Scottish primary school teachers was surveyed to investigate the impact of different models of staff development in ICT on the teacher knowledge and skills in technical; academic/content-related; pedagogy. The results indicated the need for a much greater emphasis to be placed on the pedagogy of ICT. This should be of interest to all involved in teacher education and the continuing professional development of teachers.

UNESCO (2004) conducted a study on primary school teachers and students known to be achieving either average or above average gains on measures of relative attainment by pupils that focused on pedagogy using ICT. It was observed that most successful teachers were those who used examples and counter-examples and involved students in explaining and modelling in the class. Teachers and students who favoured ICT were likely to have well-developed ICT skills and saw ICT as an important tool for learning and instruction. They were also likely to value collaborative working, enquiry and decision making by students.

Teachers' pedagogical approaches are in turn affected by a number of key factors. First, they are affected by knowledge about their own subject. There is a clear distinction between teachers who choose ICT resources to fit within a particular topic and those who choose resources merely to present pupils' work in a new way, without any direct application to the topic. The

evidence showed that when teachers use their knowledge, both the subject and also how students understand the subject with their use of ICT have more direct effect on students' attainment.

Cox and Cox (1999) reported findings of a small project funded by the Teacher Training Agency and Oracle through the MirandaNet project, set up to investigate the factors which have contributed to the continuing use of ICT by experienced ICT teachers in their teaching. Evidence was collected through a literature search, teacher questionnaire, teachers' reports and interviews. The factors which were found to be most important to these teachers in their teaching were: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable. Additionally, more personal factors were improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the school, giving the teacher more prestige, making the teachers' administration more efficient and providing professional support through the Internet.

Gray and Souter (2004) in a study of secondary school science teachers' use of ICT conducted in America focused on the data from one aspect of the use of ICT in secondary subject areas, and the perceptions of teachers in these areas. A comparison of science teachers' perceptions is made with teachers from other disciplines. Although the responses of biology teachers could be analysed, the numbers in the study were quite less so a general view was taken across the three science disciplines of biology, chemistry and physics.

Examination of the data indicated that relative to other subject teachers, science teachers came out positively with regard to the use of and confidence in ICT. However, in absolute terms, although the availability of computing facilities was reportedly quite high, actual level of use was quite low. In addition, where level of use was higher, it was with regard to a rather narrow range of applications, particularly word-processing. In addition, little was reported in the way of pupil's use ICT in Science classes. Although there appeared to be an awareness of the potential for ICT in science, teachers indicated that they did not see the introduction of ICT radically changing the way in which teaching took place, nor changing the teacher-student relationship. Science teachers were reasonably confident in their use of ICT but felt that they needed much more in the way of support and professional development to maximize their use of ICT in the classroom.

The Gordon University Aberdeen conducted a study in 2004 in Scotland on teachers' ICT skills and knowledge need, reported that the use of ICT was relatively low and is focused on a fairly narrow range of ICT. Word processing is the predominant use made of ICT in primary and secondary schools. There was some use of extremely produced educational software in both sectors, secondary school teachers and students tend to use a broader range of generic packages such as Spreadsheet than primary teachers. There was very little use of the Internet and World Wide Webb or e-mail by either primary or secondary teachers, despite the fact that the majority of secondary schools have access to the Internet.

Resources such as video conferencing and network computer conferencing are rarely used. The study further revealed that primary teachers

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used ICT primarily to support classroom practice; secondary teachers used it as much or more for professional development and personal use as in the classroom.

Teachers and students were using ICT throughout the curriculum but ICT use and attitude towards ICT use varied in secondary schools between subject areas. Mathematics and science teachers used ICT relatively little while, amongst non-computing teachers, ICT is used most by teachers of business and management subjects.

General Conclusion of the review

In conclusion, the researcher tried to progress to synthesize from a general viewpoint of the results obtained, taking into consideration the relevant aspects of the literature. The results provided by both the quantitative and qualitative analysis of the literature obtained would be exposed especially regarding those aspects which are related to ICT for Education and ICT in Education. ICT for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICT in education involves the adoption of general components of information and communication technologies in the teaching learning process.

This literature review has sought to explore the role of ICT in education as we progress into the 21st century. In particular ICT have impacted on educational practice in education to date in quite small ways but that the impact would grow considerably in years to come and that ICT would become a strong agent for change among many educational practices.

Extrapolating current activities and practices, the continued use and development of ICT within education would have a strong impact on: ICT and teaching learning process; quality and accessibility of education; learning motivation, learning environment and ICT usage and academic performance.

The adoption and use of ICT in education have a positive impact on teaching, learning, and research. ICT can affect the delivery of education and enable wider access to the same. In addition, it would increase flexibility so that learners can access the education regardless of time and geographical barriers. It can also influence the way students are taught and how they learn. Also, it would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers.

These possibilities can have an impact on student performance and achievement. Similarly, wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching and improved academic achievement of students. The overall literature suggests the need, relevance and integration of ICT in education.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the procedure adopted for this study under the following sub-headings: Design of the study, Population of the study, Sampling and Sampling procedure and Instrument for data collection. It further covers validation and reliability of the instrument, method of data collection and procedure for data analysis.

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Research Design

This study adopted a descriptive research design. According to Fox & Bayat (2007) descriptive research is "aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely than was possible without employing this method".

Burns (2000) indicated that descriptive research design involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data. A descriptive design was selected because of its high degree of representativeness and the ease in which the researcher could obtain the participants' opinion (Polit & Beck 2004). The descriptive survey design approach also seeks to gain insight into a phenomenon as a means of providing basic information in an area of study. Furthermore, the descriptive survey design offers opportunity to integrate the qualitative and quantitative methods of data collection.

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However, confidentiality is the primary weakness of descriptive research. Often, subjects are not truthful as they feel the need to tell what they think the writer wants to hear. This is particularly difficult during interviews. Participants may also refuse to provide answers to questions they view to be too personal. Descriptive research also presents the possibility for error and subjectivity. For example, when a researcher designs a questionnaire, questions are predetermined and prescriptive. Furthermore, the study may contain errors, as the researcher may record what he or she wants to hear and ignore data that does not conform to the research project's hypothesis.

Population

The target population for the study was the entire form one, form two and form three students, all teachers including ICT instructors and Laboratory Assistants of the Senior High Schools in Asikuma-Odoben-Brakwa District namely, Breman Asikuma Senior High, Odoben Senior High School, Brakwa Senior High Technical School, Best Brain Senior High Technical School and Trinity Senior High School.

Sample

Since it would be practically impossible to let all the members of the population respond to the questionnaire for lack of resources and time constraint, samples were selected for the study. Sampling is a procedure of selecting a part of a population on which research can be conducted, which ensures that conclusions drawn from the study can be generalized to the entire population. Sampling is not a technique for getting information but it ensures

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that any technique used would help in getting information from a smaller group, which could accurately represent the entire group.

Sampling Procedure

A stratified random sampling technique was used to select students, because they were from different schools with different total populations. The students were then grouped into their respective schools and two percent (2%) of the entire student population per school was selected. This was followed by simple random sampling to determine which students the questionnaire should be administered to. Papers were cut into strips and numbered from one to the last number of each school. These pieces of papers were laid on a table and the students were asked to select one each. This procedure was repeated for each of the schools. In each school, students who picked even numbers were chosen to respond to the questionnaire.

For the teachers, the same stratified sampling procedure was used because of the differences in teachers' population per school. This was followed up with simple random sampling as described in the student sample procedure.

In all, the total sample size was one hundred and seventy (170) comprised of one hundred and twenty (120) students, fourty (40) teachers and nine (9) ICT instructors and one (1) Laboratory Assistants were sampled.

Research Instrument

A questionnaire was developed and used as the data collection instrument for the research. Questionnaire was used because the entire

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population could read and write. Questionnaire is one of the best impersonal observation techniques for eliciting data (Leedy, 2001). Using the questionnaire as a research instrument is important because it does not allow the researcher to influence the respondent. The anonymity of the respondent is also guaranteed.

Two sets of questionnaire were developed and used in the study. Questionnaire for students and questionnaire for Teachers - comprising of ICT instructors, laboratory assistants and non-ICT teachers. The questionnaire was made up of closed-ended and open-ended questions. The closed-ended questions were to guide respondents to provide answers within the reviewed literature whilst the open-ended questions were used to obtain additional in-depth information from the respondents

Students' Questionnaire

The instrument contained six sections. Section A focused on the biographic information of the Students, Section B dealt with the availability of ICT facilities in the schools while Section C contained the adequacy of ICT facilities and services in these schools. Section D related to the easy accessibility to ICT facilities in these schools, Section E sought information about the attitude of students towards ICT usage in teaching and learning environment and finally, Section F looked at perceptions of students towards ICT usage in teaching and learning environment. With regard to the students, one hundred and twenty (120) questionnaires were designed and distributed to respondents.

Teachers' Questionnaire

The questionnaire for the Teachers consisted of seven (7) sections. Section one (1) delved into respondents' biographic information. The items in section two (2) solicited information regarding the availability of ICT facilities in their schools. Section three (3) sought to get answers on the adequacy of ICT facilities and services in their schools and Section four (4) enquired from the respondents the easy accessibilities to ICT facilities in their schools.

Section five (5) looked at teachers' perceptions about ICT for teaching and personal use while Section six (6) focused on teachers' use of ICT for teaching and personal use. Finally, Section seven (7) solicited questions with regard to ways to promote and integrate the effective use of ICT in teaching and learning environment. In all, fifty (50) questionnaires were designed and distributed to teacher respondents including one (1) ICT laboratory assistant.

Validation of the Instruments

The instrument was subjected to a face and content validation by my supervisor and two (2) experts from College of Distance Education of University of Cape Coast. According to Osuala (2005), content validity of an instrument demonstrates that the items of that instrument are representative and comprehensive enough to represent and measure a presumed objective and variable.

Reliability of the Instruments

Reliability, according to Fraenkel and Wallen (2000), is the consistency of an instrument for each respondent, from one administration to

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another and from one set of items to another.

The instrument was submitted to reliability testing after completion of data collection. The reliability of the instrument was determined by making use of Cronbach Alpha. The instrument was administered to one and seventy (170) students and teachers of Senior High Schools in Asikuma-Odoben-Brakwa District in the Central Region. The responses were entered into the SPSS data editor with which the reliability was calculated to be 0.9328 which showed that the instrument used was reliable.

Data Collection Procedure

The researcher introduced himself to the heads of the various schools with an introductory letter from the University ahead of the scheduled time who later arranged for students and teachers to be met.

The instrument was administered and collected personally by the researcher with the help of two teachers. The researcher explained the purpose of the study to the students and the teachers. They were made to understand that all information being provided would be treated with confidentiality and used for the purpose of research only. The respondents were required to provide information that best represented their opinions.

It took three weeks to administer and collect the questionnaire, due to the geographical location of the area. Adequate time was spent with the respondents as they went through and answered the questions and those who needed help in terms of clarifications, interpretation and writing were assisted accordingly. A total of one hundred and seventy (170) copies of the questionnaire were administered, one hundred and twenty (120) for students and fifty (50) for teachers. All the one hundred and seventy (170) copies of the

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questionnaire were duly completed and returned which represented 100% were processed for the purpose of the study. According to Babbie and Mouton (2001: 261) questionnaire response rate of more than 70% is considered to be very good.

Data Analysis

In relation to the research questions and the items in the questionnaire, descriptive statistics was used to analyse the questions. The results were presented in percentages and tables to indicate the data. Tables with frequencies and percentages were used to ensure that the issues were made clear to give visual impression on values without necessarily reading long sentences and also to help in the discussion and interpretation of the data collected.

The data collected, was organised, edited, and coded for analysis using the Statistical Package for Social Sciences (SPSS). The data analysis was designed from the variable view of SPSS data editor where, each of the items in the student's instrument was given a unique name, likewise the teachers' instruments. The possible responses of each item were also assigned a unique code. For instance items that had five possible responses strongly agree, agree, undecided, disagree and strongly disagree were assigned 1, 2, 3, 4 and 5 respectively. This was to allow for easy data inputting and analysis.

Items in the Instrument that required multiple responses were coded using yes or no for each of the responses. When checked, a response that was considered to be yes, but left unchecked was considered to be no. During analysis, all items checked were aggregated and the percentage count and

frequencies were calculated.

The items where teachers and students were required to rate their level of easy access to ICT facilities in their schools, frequently, occasionally and not used were used. During the coding, occasionally which holds the highest rating was assigned to the number 2, not used to 3 and frequently used was assigned 1 respectively. The numerical values of these numbers did not predict how frequently or occasionally a students or a teacher is having easy access to ICT facilities but rather the number of times an item is chosen by respondents. Data inputting and analysis were done through the SPSS data view. These were computed and ranked for comparisons.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results and discussion of the data analysis of the study. The presentation was organized according to the basis of biographic data of respondents and research questions of the study.

The students' questionnaire were analysed along the following areas: biographic data, degree of availability, adequacy and accessibility of ICT facilities in the schools, students' attitudes and perceptions towards ICT usage in teaching and learning environment.

The teachers and ICT laboratory assistants' questionnaire included the following: biographic data, degree of availability, adequacy and accessibility of ICT facilities in the schools, teachers' perceptions and usage of ICT for teaching and personal use and ways to promote and integrate effective use of ICT in the teaching and learning environment. The responses from students, teachers and ICT laboratory assistants were analysed using tables, figures and description of data were used to present the findings.

Biographic Data of Respondents

This section looked at the personal data of students and teachers involved in the study from all the selected schools. The details of the respondents in each institution were indicated in tables. Frequencies and simple percentages were also used in representing the biographic data of the respondents.

Table 1: Gender of Student Respondents in the Respective Schools

Name of school	Number of boys %	Number of girls %	Totals %
Breman Asikuma SHS	16 (13.33%)	16 (13.33%)	32 (26.66%)
Odoben SHS	14 (11.665%)	14 (11.665%)	28 (23.33%)
Brakwa SHTS	10 (8.335%)	10 (8.335%)	20 (16.67%)
Best Brain SHTS	10 (8.335%)	10 (8.335%)	20 (16.67%)
Trinity SHS	10 (8.335%)	10 (8.335%)	20 (16.67%)
Total	**60 (50%)**	**60 (50%)**	**120 (100%)**

From Table 1, a total of 120 Students participated in the study. 60 (50%) of the Student respondents were males and 60 (50%) were females. Gender balance was considered in administering the questionnaire. The school with the highest population sample (26.66%) was Breman Asikuma Senior High School, followed by Odoben Senior High School (23.33%) and the rest of the Senior High Schools with (16.67%) respectively.

In the same vein, the responses with regard to the gender of teacher respondents were also illustrated in Table 2.

Table 2: Gender of Teacher Respondents in the Respective Schools

Name of Institution	Males %	Females %	Totals %
Breman Asikuma SHS	11 (22%)	5 (10%)	16 (32%)
Odoben SHS	10 (20%)	4 (8%)	14 (28%)
Brakwa SHTS	7 (14%)	1 (2%)	8 (16%)
Best Brain SHTS	4 (8%)	2 (4%)	6 (12%)
Trinity SHS	6 (12%)	- (0%)	6 (12%)
Total	**38 (76%)**	**12 (24%)**	**50 (100%)**

The data in Table 2 shows that 38 (76%) males, 12 (24%) females' teacher respondents were involved in the study. The teacher respondents of Breman Asikuma Senior High Schools constituted 16 (32%), the largest of the population sampled followed by Odoben Senior High School 14 (28%). Brakwa Senior High Technical School with 8(16%) and rest of the schools follow respectively.

In summary, the instrument was administered to students and teachers of five Senior High Schools in the Asikuma-Odoben-Brakwa District. The students and teachers samples were made of both males and females so that the findings could truly be generalised as fair reflection of the state of affairs. Also, Table 1 affirmed that there were fair representations of male and females on the part of student respondents.

Table 3: Ages of Student Respondents

Ages Range	Frequency	%
15 year and below	4	3.33
16 years	22	18.34
17 years	70	58.33
18 years and above	24	20.00
Total	**120**	**100**

The data represented in Table 3, revealed that the highest percent of respondents were in the age group of 17 years which is 70 (58.33%). Twenty-four (24) and Twenty-two (22) representing 18.34% and 20% of the respondents were aged 18 and 16 years respectively. Meanwhile, only 4(3.33%) of the respondents were 15 years.

Likewise, the ages and marital status of Teacher respondents were also presented in table 4.

Table 4: Age and Marital Status of Teacher Respondents

	Range	Age	%	Marital Status		%
1	Under 25 years	--	--	Single	12	24%
2	25 – 34 years	20	(40%)	Married	38	76%
3	35 – 44 years	25	(50%)	Separated	--	- -
4	45 – 54 years	5	(10%)	Divorced	--	- -
Total		**50**	**(100%)**	**Total**	**50**	**100%**

From Table 4, it has been established that 20 (40%) of the teacher respondents were between the ages of 25-25 years, 25(50%) 35 – 44 years and 5(10%) and others between 45-54 years. On the other hand, majority of the teacher respondents were married couples constituted 38(76%) while the remaining 12(24%) were singles constituted 24%.

Table 5: Classes of Student Respondents

Classes/Forms of Respondents	Frequency	%
Form Three	20	16.67
Form Two	70	58.33
Form One	30	25.00
Total	**120**	**100**

The data in Table 5 showed the representation of respondents and their classes as 20 (16.67%) SHS Form Three, 70 (58.33%) SHS Form Two and

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30(25%) SHS Form One respectively. This implied that majority of the student respondents who answered the questionnaire were in Form Two.

Table 6: Educational Background of Teacher Respondents

Field of Study	Frequency	Percent
HND degree	6	12%
First Degree in Education	28	56%
First Degree without Education	12	24%
Master's degree	4	8%
Total	**50**	**100%**

As seen from Table 6, 28 (56%) of the respondents being the majority had first degree in Education, with 12 (24%) had first degree without Education, 4 (8%) had master's degrees and the remaining 6 (12%) also had HND degrees respectively.

Table 7: Courses Pursuing by Student Respondents

Area of Study	Frequency	%
Science	25	20.83
Business	25	20.83
General Arts	45	37.5
Home Economics	20	16.67
Others	5	4.17
Total	**120**	**100**

As shown on the Table 7, 45(37.5%) of the respondents were pursuing General Art programmes, 50(41.66%) were studying Science and Business programmes respectively. Again, 20(16.67) of the respondents were pursuing Home Economics and only 5(4.17%) of the respondents were pursuing other

programmes such as Visual Arts and Technical programmes. Similarly, the fields of study of teachers were also illustrated in Table 8.

Table 8: Teachers Field of Study

Field of Study	Frequency	Percent
Science	8	16%
Business	8	16%
General Arts	16	32%
Home Economics	8	16%
ICT	10	20%
Others	---	---
Total	**50**	**100%**

The information in Table 8 indicated that 32% of the teacher respondents were General Art teachers. Again, ICT teachers constituted 20% of the teachers that responded to the instruments. The rest were Science, Business and Home Economics teachers with 16% each respectively.

Table 9: Number of Years Respondents have being using Computers

	Students		Teachers	
Years of Computers usage	Frequency	%	Frequency	%
1-2 years	75	62.50	4	8
3-4 years	25	20.83	23	46
5-6 years	15	12.50	13	26
More than 6 years	5	4.17	10	20
Total	**120**	**100**	**50**	**100**

Table 9 revealed the responses from the respondents when they were asked about the number of years they have been using computers. 75 (62.50%)

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of students said they had used computers for 1-2 years, 25(20.83%) of students had also used computers for the past 3-4 years, and 15(12.50%) of the student respondents had used computer for 5-6 years while 5 (4.17%) of the students said they had also used computers more than 6 years.

On the other hand, Table 9 further revealed the responses from the teachers on the number of years they have been using computers. 23 (46%) said they have used computers for 3-4 years, 13(26%) disclosed that they have also used computers for the past 5-6 years and 10(20%) of the teachers also divulged that they have used computer for more than 6 years while 4 (8%) were the least respondents for using computers between 1-2 years.

Data covering research questions

This section presents data analysis of the main research questions covered by the study. The main research questions and data of specific questions relating to the issue under study were provided and discussed.

Research Question 1

What is the degree of availability of ICT facilities in your school?

To establish the degree of availability of ICT facilities in all the Senior High Schools in the District, the researcher asked respondents whether the following ICT facilities such as internet connectivity, ICT laboratory, printers, photocopies, television sets, satellites, educational software and other are available in the their respective schools. Table 10 represents the views of student respondents.

Table 10: Availability of ICT Facilities in the Schools (Students)

ICT Facilities	Yes	%	No	%
ICT laboratory	80	66.7	40	33.3
Computers in the Laboratory	80	66.7	40	33.3
Internet connectivity	64	53.3	56	46.7
Printers	120	100	0.0	0.0
Projector	60	50.0	60	50.0
Photocopier	100	80.0	20	20.0
Television set	72	60.0	48	40.0
Educational software	72	60.0	48	40.0
Satellite dish	0	0.0	120	100.0

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The information in Table 10 indicated 66.7% of the student respondents said their schools have ICT laboratories and the same percentage 66.7% of students reported that their ICT laboratories were also stocked with computers. 53.3% of the students have internet connectivity in their schools while 46.7% of the students did not have internet connectivity.

Also 100% of student respondents reported they have printers in their various schools and 50% of the students have projectors in their schools. 80%, 60% and another 60% of the students said their schools have photocopier machines, television sets and education software for teaching. 100% of the students said their schools did not have Satellite dish for viewing foreign programmes.

In the same vein, Table 11 represented views of teacher respondents with regard to availability of ICT facilities in their schools.

Table 11: Availability of ICT Facilities in the Schools (Teachers)

ICT Facilities	Yes	%	No	%
Computers in the Laboratory	16	32	34	68
Internet connectivity	42	84	8	16
Printers	42	84	8	16
Projector	30	60	20	40
Photocopier	36	72	14	28
Television set	42	84	8	16
Educational software	16	32	34	68
Satellite dish	--	---	50	100

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Table 11 revealed the responses from the respondents from the various samples when they were asked about the availability of ICT facilities in their schools. 36(70%) responded in the affirmative that they have ICT laboratories in their schools while minority of the respondents 14(28%) said they have no such facilities in their school.

Again, 30(60%) and 36(72%) of teacher respondents reported that they have projectors and photocopiers in their schools whereas the remaining 20(40%) and 14(28%) respectively said no.

Furthermore, the masses of the respondents responded positively that internet connectivity, printers and televisions sets were available in their schools. However, 34(68%) of the respondents respectively reported of inadequate computers in their ICT laboratories and educational software in their schools.

Moreover, to establish further whether computers and printers were available in the schools, students and teachers were tasked to decide the locations where they were used in their schools. The information is illustrated in Table 12 and 13 respectively.

In conclusion, the above results revealed that availability of ICT facilities and services in the schools were inadequate. Three (3) out five (5) Senior High Schools in the district did not have ICT laboratories and for that matter computers and internet were not available for students and teachers to use. This implies that the provision of ICT facilities is still very low in Asikuma-Odoben-Brakwa district in both public and private schools. This is in agreement with the findings of Tella, Tella, Toyoba, Adika and Adeyinka (2007) who reported low availability of ICT facilities in Nigeria Secondary

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School.

The unavailability of ICT facilities would no doubt put many students at disadvantage in practical application of procedure involving learning ICT while teachers would face the challenge of not being able to give most students the desire individuals attention to explain difficulty concepts to concretize their knowledge and such predicament could narrow the opportunities available to stimulate students for further usage of ICT facilities for independent learning beyond the normal classroom interaction.

Table 12: Location of Computers and Printers in the Schools (Students)

Location	Computers		Printers	
	Frequency	%	Frequency	%
Administration	40	(33.33%)	60	(50.0%)
ICT laboratory	80	(66.67%)	60	(50.0%)
Classrooms	0	(0.0%)	0	(0.0%)
Staff Common room	0	(0.0%)	0	(0.0%)
Total	**120**	**100**	**120**	**100**

The information on Table 12 indicated 33.3% and 50% of the students reported that their schools have computers and printers in their school administrations whereas 66.7% and 50% also said they have computers and printers in their ICT laboratories respectively. Also, all the students reported unanimously that they do not have computers and printers in their classrooms and staff common rooms.

Also, Table 13 represents the view of teacher respondents on location of some ICT facilities in their schools.

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Table 13: Location of Computers and Printers in the Schools (Teachers)

Location	Computers		Printers	
	Frequency	%	Frequency	%
Administration	12	24	18	36
ICT laboratory	30	60	32	64
Classrooms	-	-	-	-
Staff Common room	8	16	-	-
Total	**50**	**100**	**50**	**100**

The information on Table 13 indicated, 12 (24%) and 18 (36%) of the teachers reported that computers and printers were available in their school administrations whereas 30(60%) and 32(64%) which formed the majority also said they have computers and printers in their ICT laboratories respectively. Also, 8 (16%) of respondents in one school reported that they have computers in their staff common room and all the respondent reported that they do not have computers and printers in their classrooms.

In the nutshell, both students and teachers reported some availability of ICT facilities in their respective schools. The degrees of availability of such ICT facilities in their schools were very low. Unfortunately, all the respondents accepted that their schools did not have Satellite dish for viewing foreign programmes and there was the need to connect all the Senior High Schools in the District to the internet to enable effective research by both teachers and students. This was supported by Yusuf (2004) who asserted that availability of ICT tools make schools to be efficient and productive, engendering varieties of tools to support and facilitate teaching and teachers' professional development.

Research Question 2

What is the degree of adequacy of ICT facilities and services in your school?

The frequency of adequacy of ICT facilities and services in the schools were measured and the results were presented in Tables 14 and 15.

Table 14: Adequacy of ICT Facilities in the Schools (Students)

ICT Facilities	Yes	%	No	%
Computer laboratory stocked with adequate computers?	40	33.3	80	66.7
Are the printers, photocopiers and projectors adequately serving students?	56	46.7	64	53.3
Do you have enough educational Software in your school?	50	41.7	70	58.3
Do students have enough access school internet?	53	44.2	67	55.8
Do students have access to computer one-on-one in the ICT laboratory?	20	16.7	100	83.3

The result in Table 14 indicates 33.3 % of the student respondents said their computer laboratories were stocked with adequate computers whereas 67.7% which constituted the majority said they have limited stock of computers in their ICT laboratories. 46.7% reported that printers, photocopies and projectors were adequately served students in their schools while 53.3% stated otherwise.

Also, 41.7% of students further said, they have enough education software and 58.3% said their schools did not have enough education software for teaching and learning. 44.2% reported that they have internet connectivity in their schools while 55.8% reported that there was no internet connectivity in their schools. However, a limited number of students' representing 16.7% said

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they have access to computers one-on-one in their computer laboratories and 83.3% said two or more students used one computer in their ICT laboratories.

The findings also revealed that adequacy of ICT facilities and services such as projectors, television sets, educational software, printers, photocopiers and internet connectivity were poor in most of the schools thereby making teaching and learning unattractive to students and teachers in these schools. Yeya (2002) agreed with the above studies that schools with adequate facilities perform better in examination. This implied that lack or inadequacy of such ICT facilities would interferes with the learning process and this in turn compromise provision of quality education in the District.

Similarly, Table 14 also explains teachers' versions of adequacy of ICT facilities in their schools.

Table 15: Adequacy of ICT Facilities in the Schools (Teachers)

ICT Facilities	Yes	%	No	%
Computer laboratory stocked with adequate computers?	16	32	34	69
Are the printers, photocopiers and projectors adequately serving students?	36	72	14	28
Enough Educational Software in your school?	16	32	34	69
Do enough teachers access School internet?	12	24	38	76
Do you use projector in your teaching?	10	20	40	80

The result in Table 15 indicates that 16(32 %) of the teachers said their school computer laboratories were stocked with adequate computers whereas 34(69%) which constituted the majority, said they have limited stock of

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computers in their ICT laboratories. 36(72.7%) reported that printers, photocopies and projectors were adequate for teachers in their schools while 14(28%) stated otherwise. Unfortunately, majority of the respondents, constituted 34(69%), 38(76%) and 40 (80%) of teachers stated that their schools did not have enough education software for teaching and learning, only few teachers have access to school internet and they taught without projectors.

In conclusion, the above results revealed that the degrees of adequacy of ICT facilities in the schools were woefully inadequate. This may have negative impact of ICT education in the Senior High Schools in Asikuma-Odoben-Brakwa District. That is why the researcher agreed with Mapederun (2002) who emphasized that the availability and adequacy of educational resources affect the academic performance positively. Similarly, Chiriswa (2002) notes that effective teaching and learning depends on the availability of suitable adequate resources such as computers, internet facilities, books, laboratories, library materials and host of other visual and audio teaching aids which enhance good performance in national examination.

Research Question 3

To what extent are Students and Teachers able to have easy access to ICT facilities in their schools?

To find out whether the ICT facilities available were really accessible to students and teachers with ease, the respondents were tasked to answer a questionnaire. The results have been illustrated in Table 16 and 17 respectively.

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Table 16: Easy Access to ICT Facilities in the Schools (Students)

Statements	Frequently	Occasion-ally	Not used	Total
1. How often do you access ICT laboratory?	28(23.3%)	52(43.3%)	40(33.4%)	120 (100%)
2. Do you normally use computers in your ICT lessons?	30(25.0%)	60(50.0%)	30(25.0%)	120 (100%)
3. Do you have enough time to practice of the computer during and after the lesson?	22(18.3%)	54(45.0%)	44(36.7%)	120 (100%)
4. How often do you use internet facility in the school?	10(8.3%)	70(58.3%)	40(33.4%)	120 (100%)
5. Do you use internet for browsing and to do your research work?	7(5.8%)	30(25.0%)	83(69.2%)	120(100%)
6. How often do you use satellite dish for distance viewing of foreign programmes?	0(0.0%)	0(0.0%)	120(100%)	120(100%)
7. How often do you use e-mail to communicate?	6(5.0%)	24(20.0%)	90(75.0%)	120(100%)
8. Do you have access to the school printer to print your documents?	10(8.3%)	37(30.8%)	73(60.8%)	120(100%)
9. How often do you use the school photocopier?	11(9.2%)	42(35.0%)	67(55.8%)	120(100%)
10. Do teachers use the projector during teaching?	14(11.7%)	33(27.5%)	73(60.8%)	120(100%)
11 Do teachers use educational software for teaching?	10(8.4%)	43(35.8%)	67(55.8%)	120(100%)
12 Do you sometimes use educational software for your studies?	15(12.5%)	48(40.0%)	57(47.5%)	120(100%)

Statements	Frequency	Occasion-ally	Not Used	Total
13. Do you have access to the school internet?	10(8.4%)	54(45.0%)	56(46.6%)	120(100%)
14. Do you use the ICT laboratory after school?	4(3.3%)	56(46.7%)	60(50.0%)	120(100%)
15. Is the ICT laboratory open to students during the week ends?	2(1.7%)	32(26.7%)	86(71.6%)	120(100%)

Table 16 illustrates the responses of 120 respondents with regards to students easy access to ICT facilities available in their schools. It was observed that 28(23.3%) and 52(43.3%) of the respondents agreed that they have access to the ICT laboratory frequently, occasionally and 40(33.4%) said they did not have ICT laboratories in their schools and for that matter they did not have access to the ICT laboratories at all. On the issue of students having enough time to practice the computer during and after the lesson, 22(18.3%) said frequently, majority representing 54(45.0%) said occasionally and 44(36.7%) said not at all.

Also, with regards to students often use of internet facilities in their schools, as low as 10(8.3%) said frequently, 70(58.3%) which constituted the majority said occasionally and 40(33.4%) said they did not use internet facilities in their studies because there were no such facilities in their schools. On whether students use internet for browsing and to do their research work, a limited number of respondents of 7(5.8%) said frequently, 30(25.0%) said occasionally and majority of the respondents such as 83(69.2%) said they did not use internet facilities in their studies.

Furthermore, the statements that teachers use educational software for teaching and how often did students use educational software for their studies,

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10(8.4%), and 15(12.5%) reported frequently, 33(27.5%) and 43(35.8%) said

occasionally and 73(60.8%) and 67(55.8%) which constituted the masses of

the respondents said they did not use educational software.

On the other hand Table 17 presents the views of teachers with regard

to easy access to ICT facilities in the schools.

Table 17: Easy Access to ICT Facilities in the Schools (Teachers)

Statements	Frequently	Occasion-ally	Not used	Total
1. How often do you access ICT laboratory?	14(28%)	20(40%)	16(32%)	50 (100%)
2. Do you normally use computers in your lessons?	20(40%)	16(32%)	14(28%)	50 (100%)
3. Do you have enough time to practice on the computer during and after the lesson?	17(34%)	23(46%)	10(20%)	50 (100%)
4. How often do you use internet facility in the school?	7(14%)	22(44%)	21(42%)	50 (100%)
5. Do you use internet for browsing and to do your research work?	14(28%)	20(40%)	16(32%)	50 (100%)
6. How often do you use satellite dish for distance viewing of foreign programmes?	--	--	50(100%)	50 (100%)
7. How often do you use e-mail to communicate?	12(24%)	28(56%)	10(20%)	50 (100%)
8. Do you have access to the school printer to print your document?	28(56%)	12(24%)	10(20%)	50 (100%)
9. How often do you use the school photocopier?	12(24%)	18(36%)	20(40%)	50(100%)

Table 17 illustrates the responses of 50 respondents with regards to

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teachers' easy access to ICT facilities available in their schools. It was observed that 14(28%) and 20 (40%) of the respondents agreed that they have access to the ICT laboratory frequently, occasionally and 10(20%) said they did not have ICT laboratories in their schools and for that matter they did not access the ICT laboratories at all.

On the issue of teachers having enough time to practice on the computer during and after the lesson, 17(34%) said frequently, 16(32%) said occasionally and 14(28%) said not at all.

Also, with regards to teachers often use of internet facilities in their schools, as low as 7(14%) said frequently, 22(44%) which constituted the majority said occasionally and 21(42%) said they did not use internet facilities in their studies because there were no such facilities in their schools. On whether teachers' use the internet for browsing and to do their research work, a limited number of respondents of 14(28%) said frequently, 20(40%) said occasionally and majority of the respondents such as 16(32%) said they did not use internet facilities in their studies.

Furthermore, on the issue of using satellite dish for distance viewing of foreign programmes on their campuses, all the respondents, 50 (100%) recounted they did not have such facilities on their campuses. On the other hand, 10(20%) and 20 (40%) reported that they did not use school printer and photocopiers because they have no such facilities in their schools.

In view of the above, it is concluded that both teachers and students agreed that they have easy access to some of the ICT facilities available in schools. This corroborates the report by Gray and Souter, (2004) that teachers and students came out positively with regards to the use of ICT facilities.

It also confirms the assertion that availability of facilities usually determines access. If ICT facilities are available, this would motivate the teachers and students to access them than when it is not available or available but not in sufficient quantity and quality.

All these may be responsible for the relatively low use of ICT by Ghanaian teachers and students. In the teachers Enlace program in Chile (2004), insufficient number of computers, access to technology and time for practice have been identified as the most important obstacle in the realisation of computer-related goals in schools (Pedro, Hinostroza, Enrique, Laval, Ernesto, Rehbein and Lucio, 2004)

Research Question 4

What are the attitudes of students towards ICT usage in teaching and learning environment?

Respondents were asked to rate themselves on their attitudes towards ICT usage in the teaching and learning environment or during ICT lessons. Respondents were asked to rate themselves on a five point tick scale of Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). The result is presented in Table 10.

Table 18: Students Attitudes towards ICT usage in Teaching and Learning Environment

S/N	Attitudes Towards ICT Usage	SA	A	U	D	SD	Total
1	ICT do not scare me at all	76	26	4	6	8	120
2	I would like working with computers	65	34	5	12	4	120
3	ICT lessons are a favourite subject for me	46	52	4	1	6	120

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	Attitudes Towards ICT Usage	SA	A	U	D	SD	Total
4.	I pay attention during ICT lessons	62	37	10	4	7	120
5.	I want to learn a lot about ICT	83	31	6	0	0	120
6.	A computer test would scare me	18	20	10	36	36	120
7.	I like working on a computer	49	53	4	7	7	120
8.	Computers are not exciting me	10	4	24	33	49	120
9.	Studying ICT is a waste of time	4	0	20	32	64	120
10.	ICT is not exciting	2	3	15	30	70	120
11.	Computers intimidate and threaten me	3	8	19	25	65	120
12.	ICT is difficult to understand	6	6	27	27	54	120
13.	Working with computers make me feel tense and uncomfortable	10	6	12	42	50	120
14.	I enjoy learning how ICT is used in our daily lives	60	25	13	12	10	120
15.	I feel apprehensive about the use of computers in the laboratory	10	10	20	40	40	120
16.	I don't pay attention when am learning in the ICT laboratory	4	13	15	39	49	120

The result in Table 18 presents the distribution of the respondents on their attitudes toward ICT usage in teaching and the learning environments. It revealed that majority of the respondents, 76(63.33%) and 26(21.67%) strongly agreed and agreed that ICT did not scare them at all whereas a few number of 4(3.33%) were undecided, 8(6.67%) and 6(5%) strongly disagreed and disagreed respectively.

Furthermore, the result shows that 45(37.5%) respondents strongly agreed and 56(46.67%) agreed that ICT lessons were their favourite while

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4(3.33%) were undecided, 12(10%) were strongly disagreed and 6(5%) disagreed with the statement.

It was also shown in Table 10 that 62(51.67%) respondents and 37(30.83%) strongly agreed and agreed that they paid attention during ICT lessons at the computer laboratory, 10(8.33%) were undecided, 4(3.33%) and 7(5.83%) respondents disagreed and strongly disagreed. Additionally, 32(26.67%) and 64(53.33%) respondents disagreed and strongly disagreed that studying ICT is a waste of time and less than 5(4.17%) respondents strongly disagreed. No respondent agreed to that assertion but 20(16.67%) respondents were undecided.

Moreover, 50(41.67%) and 42(35%) respondents disagreed and strongly disagreed that working with computers made them feel tensed and uncomfortable whereas 10(8.33%) and 6(5%) respondents strongly agree and agree to the statement but 12(10%) respondents were undecided. However, 60(50%) and 25(20.83%) respondents strongly agreed and agreed to the statement that they enjoyed learning how ICT is used in their daily lives. 12(10%) and 10(8.33%) respondents disagreed and strongly disagreed to the statement. The result also showed that only 4(3.33%) and 13(10.83%) of the respondents strongly agreed and agreed that they did not pay attention when they were learning in the ICT laboratory but 39(32.5%) and 49(40.83%) respondents strongly disagreed and disagreed to that assertion. 15(12.5%) respondents were undecided.

Finally, as shown in table 10(8.33%), 49(40.83%) and 53(44.17%) respondents were strongly agreed and agreed that they liked working on a computer whereas 7(5.83%) respectively were disagreed and strongly

disagreed to the statement. However, 4(3.33%) respondents were undecided.

The findings from Table 18 indicated that students had good attitudes towards the ICT usage in teaching and learning environment despite the unavailability and inadequacy of ICT facilities in their schools. This is true when Kulik's (1994) meta-analysis study revealed that, on average, students who used ICT-based instruction scored higher than students without computers. The students also learned more in less time and liked their classes more when ICT-based instruction was included. This implies that good attitudes towards ICT usage promote positive learning.

In conclusion, there is a common saying that attitude determines altitude. Studies have established close links and affinities between students' attitude and their use of ICT. Students' positive attitudes towards the computer were associated with a higher level of computer experience (Teo, 2008). Students' confidence on ICT can be explained through the attitude and behaviours of their teachers. Teachers' behaviour is a critical influence on students' confidence and attitude towards ICT as they provide important role model to their students in teaching and learning environment (Derbyshire, 2003).

Research Question 5

What are perceptions of students towards ICT usage in teaching and learning environment?

This item provides data about the perceptions of students towards ICT usage in the teaching and learning environment. Students were asked to measure themselves on the following scale: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). The data captured in Table 19 illustrates the details

Table 19: Students Perceptions towards ICT usage in Teaching and Learning Environment

S/N	Perception Towards ICT Usage	SA	A	U	D	SD	Total
1	Do you know using computers in teaching and learning process has some benefits?	70	38	12	0	0	120
2	Using ICT makes lessons more interesting	70	36	14	0	0	120
3	Using ICT in the teaching and learning process is enjoyable	66	42	12	0	0	120
4	Using ICT makes the lesson more fun	72	38	10	0	0	120
5	Using ICT makes the lesson more diverse	34	27	33	12	14	120
6	Using ICT improves presentation of Materials	68	32	16	4	0	120
7	Using ICT makes lesson more difficult.	0	0	14	56	50	120
8	Using ICT reduces my motivation	4	4	14	48	50	120
9	Using ICT impairs my learning	0	0	12	60	48	120
10	Using ICT makes lessons more understanding	74	38	8	0	0	120
11	ICT makes learning more effective	73	38	9	0	0	120
12	ICT helps to meet the varying needs of students	52	44	24	0	0	120

The result in Table 19 showed that 70(58.33%) and 36(30%) respondents strongly agreed and agreed that using ICT makes lesson more interesting, 12(10%) respondents were undecided and all the respondents disagreed or strongly disagreed to the statement. Furthermore, the result showed that 72(60%) respondents strongly agreed and 38(31.67%) agreed that using ICT makes lessons to be more fun however, 10(8.33%) of the respondents were undecided whether using ICT makes lesson more fun or not.

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It is also shown in Table 19 that 34(30.83%) respondents and 27(22.5%) strongly agreed and agreed that using ICT makes lesson more diverse. This is more than the numbers of those who strongly disagreed and disagreed the statement. Additionally, 68(56.67%) and 32(26.67%) respondents indicated that using ICT improves presentation of materials during their lesson. This is also greater than 16(13.33%) and 4(3.33%) respondents who were undecided and disagreed to this statement.

On the other hand, 4(3.33%) respondents indicated strongly agreed to the statement that using ICT reduce their motivation in teaching and learning process with another 4(3.33%) indicated agreed respectively. On the contrary, 48(40%) and 50(41.67%) respondents indicated that they strongly disagreed and disagreed to the statement and 14(11.67%) were undecided.

In conclusion, Ahmed and Abdulaziz (2004) summarized that "different learning environments did not produce significant difference in students' attitudes toward technology". Students' positive attitudes toward ICT revealed that ICT plays a role in students' learning, albeit a secondary role. This supports what British Educational Communication and Technology (2003) cited in Becker (2000) on the argument that students were generally more 'on task' and expressed more positive feelings when they use computers than when they were given other tasks to do

Research Question 6

What are Teachers' perceptions about the ICT for teaching and personal use?

This item provides data that determines the perceptions of teachers on ICT for teaching and personal use. Teachers were asked to measure

themselves on the scale of Strongly Agree (SA), Agree (A), Undecided (U),

Disagree (D) and Strongly Disagree (SD). The data captured in Table 20

illustrates the details

Table 20: Teachers Perception about ICT for Teaching and Personal use

No	Statement or items	SA	A	U	D	SD	Total
1	Using ICT makes it more difficult to control the class	4	-	-	22	24	50
2	ICT makes the lesson more difficult	2	-	-	21	27	50
3	ICT makes preparation of the lesson more difficult	3	-	-	20	27	50
4	Hardware and software problems often disrupt the lesson	8	10	6	12	14	50
5	Using ICT in teaching is expensive	16	8	3	10	13	50
6	Using ICT makes lesson more interesting	36	10	4	-	-	50
7	Using ICT in teaching and learning is not enjoyable	14	4	4	6	22	50
8	Using ICT makes the lesson more fun	24	26	-	-	-	50
9	ICT makes the lesson more diverse	17	31	2	-	-	50
10	Using ICT improves presentation of materials	24	25	-	1	-	50
11	Using ICT makes lesson more understanding	27	23	-	-	-	50
12	Using ICT reduces students motivation	-	-	-	10	40	50
13	Using ICT impairs students learning	8	-	2	4	36	50

The results in Table 20 showed that 36(72%) and 10(20%) of the respondents strongly agreed and agreed that using ICT made lessons more interesting, 4(8%) were undecided, no respondent strongly agreed or disagreed to the statement. Furthermore, the result showed that all the respondents 14(28%) and 36(72%) unanimously agreed and strongly agreed that using ICT motivates students to learn better and nobody reported any objection to the statement.

It is also shown in Table 20 that all the 50(100%) of the respondents agreed and strongly agreed that using ICT improved presentation of materials in teaching and learning process. Additionally, 24(48%) and 26(52%) of the respondents indicated that using ICT was more fun. There were no disagreement and undecided to the statement. Also, majority of the respondents 8(16%) and 16(32%) agreed and strongly agreed that using ICT in teaching is more expensive. This was greater than the number of those who were undecided, disagreed and strongly disagreed.

On the other hand, 14(28%) of the respondents indicated strongly agreed to the statement that using ICT in their teaching is not enjoyable with another 4(8%) indicated agreed respectively. Contrary, 22(44%) and 6(12%) of the respondents indicated that they strongly disagreed and disagreed with the statement. The results further indicated that respondents strongly disagreed and disagreed that using ICT made it more difficult to control the class, made lessons more difficult, reduced students motivation and impaired students' learning than the numbers of those who strongly agreed and agreed with the statements. The respondents also debunked the statement that using ICT made the lessons preparation more difficult.

The findings from Table 20 revealed that teachers have very positive perceptions on the use of ICT in their schools even though some of these facilities were not available and accessible. As pointed out by Kula (2010) if teachers were indeed interested in using ICT, then they would do so effectively, but the right attitudes and positive perceptions the teachers have in using the ICT meaningfully. Research indicates that when teachers value the benefits of ICT, their attitudes towards the use of ICT tend to be more positive (Teo 2008). Becta (2008) have tried to bring to the fore these contrasting perceptions of teachers and even revealed that despite the continuous hype of the advantages of ICT in teaching and learning, there is still a small group of teachers who do not see any considerable benefit to learners while using ICT.

Research Question 7

How often do teachers use ICT for teaching and personal use?

This item looks at how often teachers use ICT for teaching and personal use. One's ability to do something, to a level of satisfaction depends on one's skill, including knowledge. Knowledge is the application of reasoning and it is the result of reasoned analysis of information. The ability to use ICT is a skill that must be acquired through practice.

The competence level of teachers is very essential since it is the teachers who would in turn pass on the skill to students. If the teachers do not have in-depth knowledge of ICT, it would be difficult to use these tools to teach their respective subject areas and use ICT tools to record students' records for his or her own personal use. Teachers' lack of knowledge and skills is listed as the second most important obstacle affecting the realization

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of computer-related goals in schools in the teachers Enlaces program in Chile (Pedro et al., 2004).

The responses of respondents for the use of ICT for teaching and personal use were captured in Table 21 and 22 respectively.

Table 21: Teachers' use of ICT for Teaching

No	Statement or items	Very often	Often	Rarely	Never	Total
1	How often do you use the ICT laboratory for you lessons?	8	14	5	23	50
2	Do you normally use computers in your ICT lessons?	7	17	3	23	50
3	Do you have enough time to practice on the computer during and after the lessons?	4	20	7	19	50
4	How often do you use internet facility in the school to facilitate your lesson?	9	9	9	23	50
5	Do you use internet for your research work when preparing your lessons?	8	26	2	14	50
6	How often do you use e-mail to communicate with students?	2	6	13	29	50
7	How often do you use the school photocopier?	-	13	13	24	50
8	Do you use projector when teaching?	5	5	16	24	50
9	Do you use education software for teaching?	-	8	17	25	50
10	How often do you use PowerPoint presentation in your lesson delivery?	6	11	16	17	50
11	Do you use the school printer to print your document?	12	20	8	10	50

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Table 21 illustrates the responses of the respondents with regard to how often they use ICT facilities for teaching. It is observed that 20(40%) and 12(24%) of the respondents often and very often use the school printer to print their documents; this is greater than the number of those who use it rarely and those who never use them.

Furthermore, 8(16%) and 20(40%) of the respondents very often and often used internet for their research work when preparing their lessons. Also, the masses of the respondents such as 23(46%), 24(48%), 23(46%), 29(58%) and 24(48%), 25(50%) concurrently never used the ICT laboratory for their lessons, used school photocopier, used projector when teaching, e-mail to communicate with their students, and used software when teaching but quite a number of respondents very often, often and rarely use such ICT facilities in their schools to facilitate teaching.

The result from Table 21 also depicts that few respondents such as 8(16%) and 7(14%) very often used ICT laboratory for their lessons and used computers for their lesson whereas 14(28%) and 17(34%) often used such facilities in their schools to support their teaching activities.

The above results revealed that ICT use for teaching included preparation of notes, teaching-learning materials, examinations and searching materials with students. Such uses helped to clarify difficult concepts, save time, make learners active, and simplify teachers' work. Indeed literature has proved beyond any reasonable doubt that when used appropriately by teachers, ICT can have positive impact on the way teachers teach and the way learners learn thus improving pedagogy (Hennessey, Harrison and Wamakote 2010).

Table 22: Teachers' personal use of ICT Facilities

SN	Statements	Yes	No	Total
1	I can boot the computer	50	-	50
2	I use the computer to teach my students	23	27	50
3	I use the computer to keep records	46	4	50
4	I use Microsoft Word to type questions and other documents	46	4	50
5	I use Microsoft Excel to teach basic mathematics	17	39	50
6	I use PowerPoint in presenting my lesson	8	42	50
7	I browse the Internet to get materials for teaching	45	5	50
8	I have an e-mail address	50	-	50
9	I can use a search engine such as google yahoo etc	50	-	50
10	I use education software such as CAI for teaching	18	32	50
11	I can set up a database using MS Access	32	18	50
12	I can use a scanner to copy images	41	9	50
13	I can operate a printer that is connected to the computer	50	-	50
14	I can set up a multimedia projector	42	8	50
15	Do you maintain a personal web page as teaching tool?	11	39	50

The data in Table 22 showed that 50(100%) of the respondents unanimously reported that they could boot a computer, have an e-mail

addresses, used a search engines such as yahoo and google to find information on the internet and they could operate a printer that is connected to the computer.

Again, the majority of the respondents constituted 46(92%), 45(90%), 41(82%) and 42(84%) answered in the affirmative that they used the computer to keep records, use Microsoft Word to type their questions and other documents, browsed the Internet to get materials for teaching, use a scanner to copy images and they could set up a multimedia projector and use for teaching whereas few respondents such as 4(8%), 5(10%), 9(18%), and 8(16%) answered no to these statements. However, 39(78%), 42(4%), 8(16%), 32(64%) and 49(98%) of the respondents said they cannot use Microsoft Excel to teach basic mathematics, use PowerPoint in presenting their lessons, use education software such as CAI for teaching and maintain a personal web page as teaching tool.

In conclusion, it could be deduced from Table 22 that majority of the teachers' knowledge and skills in the use of ICT were restricted to application software only and not being used as a pedagogical tool. For their personal use of ICT tools in their lives, only 10(20%) of the teachers used it and incorporated them in their daily lives and work which helped them to deliver their lessons very well.

Therefore, organization of training, workshops, and seminars should be done for teachers regularly to boost their knowledge based in ICT so that they would feel motivated and confident to use ICT in their work. This implied that the lack of computer training could lead to cyber phobia, which according to Agbatogun (2010) is likely to limit their use of ICT. Dogan (2010) also

pointed out that, *inter alia*, teacher training in ICT is vital for future conception and uses of computers for teaching and learning process.

Research Question 8

In what ways will you promote and integrate the effective use of ICT in teaching and learning environment?

It can succinctly be stated that effective use of ICT in the teaching and learning environment is so critical to ensure effective and efficient delivery of lessons. In pursuance of these, research question 8 sought to investigate the ways through which teachers could promote and integrate the effective use of ICT in teaching and learning process. Table 23 presents the responses from the respondents.

Table 23: Ways to Promote Effective use of ICT in Teaching and Learning Environment

Statement	S A	A	U	D	S D	T
1. Use internet to do research in addition to the information in textbooks.	30	18	2	-	-	50
2. Use PowerPoint presentation in teaching.	20	22	8	-	-	50
3. Use video to present lessons.	11	26	10	3	-	50
4. Communicate with students via e-mail.	4	30	4	2	-	50
5. Use email to give students projects in future.	8	30	6	6	-	50
6. Students to present their assignments via e-mails vacations	6	29	12	3	-	50
7. Integrate computer in continuous assessment scores generations.	15	35	-	-	-	50

Statement	SA	A	U	D	SD	T
8. Use database to create and maintain basic information about students in a class.	9	29	7	-	-	50
9. Use spreadsheet to produce graphs and students task to show relationships.	13	23	6	4	4	50
10. Use computer graphics as a cue or primary information in teaching new topic.	9	25	16	-	-	50
11. Allow students to print their assignment using the ICT laboratory printer.	18	22	9	1	-	50

Key: SA = strongly agree; A = agreed; U = undecided; D = disagree; SD = strongly disagree, and T= total.

It could be seen from the summary of responses in Table 23 that all the 11 items were accepted and rated very high and only 8(16%) respondents gave their opinions that these factors were possible ways of promoting effective use of ICT in teaching and learning environment.

The following items were however unanimously agreed with regard to the views of teachers on the ways of promoting effective use of ICT in teaching and learning in their various schools. It is observed from Table 26 that majority of the respondents 18(36%), 22(44%), 35(70%) and 22(44%) agreed and 30(60%), 20(40%), 15(30%) and 18(36%) strongly agreed to research on topics to be taught using the internet in addition to the information in textbooks. Also, majority of the respondents 20(40%) and 22(44%) who use PowerPoint presentations to deliver lessons were lesser as compared to the respondents 30(60%) and 18(36%) who integrate computers in continuous

assessment scores generations as well as students 18(36%) and 22(44%) who print their assignments from the ICT laboratory printers.

On the other side, few respondents such as 16(32%) were confused and undecided whether to use computer graphics as a cue or primary information in teaching new topic while 29(58%) allowed students to present their assignments via emails if they are unable to attend classes or during vacations, use video to present lessons gave students firsthand experience in lessons and allowed students to print their assignments using the ICT laboratory printer.

In conclusion, integrating ICT in teaching and learning could make a real difference in how teachers teach. It enables the teacher to spend more time with individual students, use less time teaching the whole class and allow students to carry out more independent work (Dilli, 2007).

In information and communications technology, Internet and computer stimulate, motivate and spark students' appetite for learning and help to create a culture of success. "This can be demonstrated in increased commitment to the learning task, enhanced enjoyment, interest and sense of achievement in learning when using ICT, and enhanced their self-esteem" (British Educational Communication and Technology, 2003). Thus, "integrating technology in education contributes to both teacher effectiveness and student achievement" (Dilli, 2007).

The above findings confirmed that teachers believe that ICT could be used as a pedagogical tool in improving their teaching when there are adequate resources and infrastructures. This means that if these barriers are resolved, ICT could be used as a pedagogical tool. The current findings concurred with

the research findings by Teo (2008) who found that teachers were more positive about their attitude towards computers and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer. Cubukcuoglu (2013) also found that in order to create an environment where technology is used frequently and effectively, it is important to support the needs of teachers in using technology in teaching and learning.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Overview of the Study

This chapter summarizes the research study and also presents a summary of the findings of the study as well as conclusions drawn from the findings. Based on the findings and conclusions drawn from the study, recommendations were also made to guide educational practitioners and stakeholders.

The study sought to find out how ICT facilities in the Senior High Schools in Asikuma-Odoben-Brakwa District were utilized by students, ICT laboratory assistants and teachers. The purpose or focus of the study was to assess the ICT utilization in the Senior High Schools to enhance learning and improve teaching methods as well as the management of the institutions in general.

The specific objectives were to examine the adequacy of ICT facilities and services in the schools, identify the accessibility of ICT facilities and services by students and teachers and find out the attitudes and perceptions of students towards ICT usage in teaching and learning environment. It also seeks to examine the perceptions of teachers on the usage of ICT for teaching, professional development and personal use and finally to identify ways of promoting and integrating the effective use of ICT in teaching and learning environment.

After reviewing the literature, eight research questions were formulated to direct the study. The research questions focused on the degree of availability and adequacy of ICT facilities and services in these schools and the extent to which students and teachers have easy access to these facilities in their schools. It also focused on the attitudes and perceptions of students towards ICT usage in teaching and learning environment as well as the teachers' perceptions about the ICT for teaching, and personal use. Finally, the research questions also addressed the ways of promoting and integrating the effective use of ICT in teaching and learning environment.

In pursuance of these objectives, the descriptive survey design was used for the study. A total sample of 170 respondents took part in the survey, made up of 120 students and 50 teachers. The samples were picked from five Senior High Schools, comprised of 60 males, 60 female students, 12 females, and 38 males from the teachers' sample.

Questionnaire was used as the main instrument for data collection to arrive at an understanding of the phenomenon. The data collected were coded, fed into the computer and analyzed using the SPSS computer application software and Microsoft Excel. Basically, descriptive statistics was used for the data analysis. Frequencies and percentages, simple tables and figures were employed to analyze the data on the views of students as well as teachers on the assessment of ICT utilizations in Senior High Schools in Asikuma-Odoben-Brakwa District.

Summary of main Findings

The results of the study were discussed according to the sub-headings which corresponded to the sections of the instrument. Based on the students and teachers responses to the questionnaires, the following enumerated findings were made.

1) The availability of ICT facilities and services in the schools were inadequate. Three of the Senior High Schools did not have ICT laboratories and for that matter computers were not available for students and teachers to use.

2) On the issue of using satellite dish for distance viewing of foreign programmes, all the schools recounted that such facilities were unavailable in their campuses.

3) The findings also revealed that adequacy of ICT facilities and services such as projectors, television sets, educational software, printers, photocopiers and internet connectivity were poor in most of the schools thereby making teaching and learning unattractive to students and teachers in these schools.

4) Accessibility to most of these ICT facilities and services in these schools were woefully inadequate since most of them were unavailable in the schools.

5) The attitudes of students towards ICT usage in teaching and learning environment were very positive except few who were undecided.

6) Generally, the results of the findings depicted that students' perception towards ICT usage in teaching and learning environment was absolutely affirmative.

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7) Both teachers and students have very positive perception on the use of ICT in their schools even though some of these facilities were not available and accessible to them.

8) Majority of the teachers agreed and strongly agreed that using ICT in teaching was more expensive.

9) Teachers and students level of competence in ICT use was low and their skills in ICT usage were restricted mainly to application software. The masses of teachers rarely used the ICT facilities, whereas those who professed to be versed in ICT used them often.

10) Teachers were yearning for ICT training to enable them integrate or make effective use of it in their teaching pedagogy.

11) The respondents overwhelmingly advocated for high application of ICT facilities in the Senior High Schools' teaching, learning, research and administration services.

12) Finally, the study also revealed that most of the schools lacked trained ICT teachers and laboratory technicians.

Conclusion

This study aimed at assessing the ICT utilization in Senior High Schools in Asikuma-Odoben-Brakwa District. On the basis of the findings of the study, the following conclusions were drawn from the district. These were;

The degree of availability and adequacy of ICT facilities such computer laboratories, computers, printers, photocopiers, projectors and educational software and others in the Senior High Schools were absolutely poor and insufficient. This situation is making teaching and learning of ICT

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very difficult for students and teachers since most of these facilities were unavailable to use.

On the whole, the accessibility of ICT facilities and services in all the facets of the schools' operations were not encouraging. They were abysmally low for teaching and learning and among others. Majority of the students were not familiar with the internet. About 16% of teachers and students resort to the use of private Internet Café for a fee in their respective communities.

The study revealed that, the ICT knowledge-based of respondents was at a low level to enable them adopt and harness the mass of academic resources that ICT avails. However, the study also affirmed that, the perceptions of respondents to the usage of ICT in teaching and learning environment were quite good and because of that students and teachers have good attitudes towards the subject.

The study acknowledged that there were inadequate trained ICT teachers and laboratory technicians in the schools to support the development and usage of ICT on their campuses. In some instances ICT teachers also double as laboratory technicians. This implied that teachers in the District need ICT training in their teaching pedagogy.

Satellite dish for distance viewing of foreign programmes was not available in all the schools and the study also revealed that students from Government schools were very more exposed to ICT usage in the classroom than their private school counterparts.

The study further showed that teachers' integration and effective use of ICT in teaching and learning environment were very low. For instance, students from private schools however, were more positive about the impact of

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ICT use: potentially pointing to the dangers of over-use, or even that teachers were failing to successfully use ICT in teaching and learning. From this study, there was clear evidence that with the proper professional development, appropriate technology and continuous support from the Ministry of Education, Senior High Schools in Asikuma-Odoben-Brakwa District could also have ICT successfully integrated in the teaching and learning environment.

Recommendations

In the light of the findings and conclusions of the study, the following recommendations have been made to the management of the schools, teachers, students, Ghana Education Service and other stakeholders to ensure high utilization of ICT in the Senior High Schools in Asikuma-Odoben-Brakwa District.

1. Adequate ICT facilities, infrastructure and services should be provided by the schools. There is overwhelming need for the schools to set up ICT laboratories and stock them with adequate computers to facilitate teaching, learning and research work in the schools.

2. Provision of internet connectivity to schools without Internet, should be accelerated. It is therefore recommended to Heads of Institutions, Parents Teachers Associations, District and Regional Directorate of Education, District Assembly and Ministry of Education to collaborate and connect schools without internet facilities to the internet. It would allow effective sharing of information between students and teachers in different schools and their colleagues.

3. There should be provision of projectors in the schools to facilitate the use of presentation software such as Microsoft PowerPoint to enhance and facilitate teaching and learning.

4. Schools should be equipped with adequate educational software to enable students and teachers to have access to the wealth of resources and educational software available on the net to enhance teaching and learning.

5. Vigorous ICT educational campaign should be organized to drive home the importance of ICT for teaching, learning and research in all the educational institutions in the district. Training programmes should be organized for teachers on how to use ICT in the teaching, learning, and research to augment their teaching pedagogy.

6. ICT facilities and services available in the schools should be made accessible to students and teachers during and after school lessons. Also, students should be given enough time to practice on the computer during and after lessons to sharpen their ICT skills. Furthermore, teachers and students should have access to printers and photocopies to print their document and assignments.

7. The attitude and perceptions of students and teachers towards the usage of ICT should be reinforced. It is therefore recommended to the Ghana Education Service, Ministry of Education and other stakeholder like West Africa Examination Council to make ICT an examinable subject in the Senior High Schools to enable them to promote and develop more interest in the subject. This would also ensure that ICT facilities

are available in the schools for students and teachers to ensure high performance.

8. To solve the problem of inadequate ICT teachers in the Senior High Schools, It is therefore suggested that Ghana Education service should expand the ICT quota system on study leave to enable more teachers to be trained in that field. Asikuma-Odoben-Brakwa District Assembly should also institute scholarship scheme for teachers who want to pursue ICT courses at the tertiary institutions so that after completion they would be retained in the district to teach ICT.

9. Training, workshops, and seminars should be organised for teachers regularly to boost their knowledge base in ICT so that they would be motivated and confident to use ICT in their work.

10. Teachers should be taught how to use the ICT facilities for effective teaching in the various academic streams; though lessons are more interesting with ICT generally, positive impact on student motivation depends on the ways in which the ICT facilities are used.

11. Finally, the Senior High Schools in Asikuma-Odoben-Brakwa District should seek for exchange programmes with others schools in Europe, Asia and America. This would bring on board equipment for viewing foreign programmes which are absent in all the schools and improve the quality of education in Asikuma-Odoben-Brakwa District in the Central Region of Ghana.

Suggestions for further Research

Future research could focus on the following areas;

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1. The research could be replicated in other universities in the country so that the findings could be generalised as a true reflection of what pertains in Senior High Schools in Asikuma-Odoben-Brakwa District.

2. Future work should extend the target group to cover other stakeholders such as headmasters and mistresses and administration staff who were not covered in this study.

3. Future research could also be focused on classroom observations to ascertain the actual use of ICT in teaching and learning as this study solely depends on self-reported data.

4. Other researchers might extend these findings to the school leadership in the integration of ICT in the Senior High Schools Teachers' pedagogy.

REFERENCES

Addo, J. R. (2003). Impact of Information and Communication Technology on Administrative Planning in the University of Cape Coast. Retrieved 25th June, 2015 from https://www.google.com.gh/?gfe_rd=cr&ei=cgbHV5fLBMLBaMqwt7gL#q=Addo%2C+J.+R.+%282003%29.+Impact+of+Information+and+Communication+Technology+on++Administrative+Planning+in+the+University+of+Cape+Coast.

Adeya, N. C. (2002). ICTs and Poverty: A Literature Review. UNESCO. Available: http://www.idrc.ca/en/ev-24718-201-1-DO_TOPIC.html.

Adubifa, O., & Akin, T. (2001). *Towards the Introduction and Application of Information and Communication Technologies in African Universities*. Accra, Ghana: Association of African Universities.

Affairs, M. (2000). *Good Practice and Leadership in the Use Of ICT in Schools*. Retrieved November, 19th 2007 from http://www.edna.edu.au/sibling/Leading/practice.

Agbatogun, A. (2010). Self-concept, computer anxiety, gender and attitude towards interactive computer technologies: A predictive study among Nigerian teachers', *International Journal of Education and Development Using Information and Communication Technology*, 6(2), P. 1-14.

Ahmed, A., & Abdulaziz, E. (2004). Examining Students Performance and Attitudes Towards the Use of Information Technology in a Virtual and Conventional Setting, *Journal of Interactive Online Learning, 2*(3), 30-46.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Englewood Cliffs, NJ: Prentice-Hall.

Al-Ansari, H. (2006). Internet use by the faculty members of Kuwait University. *The Electronic Library, 24*(6), P. 791-803.

Asante, A., (2000). A Survey into the use of Computers in the Teaching and Learning of Mathematics. Retrieved 20th June, 2015 fromhttps://www.google.com.gh/?gfe_rd=cr&ei=ThrMV-erHo-CaJ_Rj AE#q=Asante%2C+A.%2C+(2000).+A+Survey+into+the+use+of+Co mputers+in+the+Teaching+and++Learning+of+++Mathematics%2C+r eference%2C+pdf.

Attwell, P., & Battle, J. (1999). Home Computers and School Performance. *The Information Society*, *1*(15), P. 1-10.

Babbie, E., & Mouton, J. (2001). The practice of social research. Cape Town: Oxford University Press.

Bates, A.W. (1995). Technology Open learning and Distance Education. Routledge. London.

Becker, H. J. (2000). Pedagogical Motivations for Student Computer Use that Leads to Student Engagement. *Education Technology*, 40(5), P. 5-17.

Becta (2003) A Review of the Research Literature on Barriers to the Uptake of ICT by Teachers (Online), available: http://partners.becta.org.uk/Page _documents/research/barriers.pdf.

Bell, J. (2003). *Doing Your Research Project*. Buckingham: Open University Press. Berge, Z. (1998). Guiding principles in Web-based instructional design. *Education Media International, 35*(2), P. 72-76.

Bhattacharya, I., & Sharma, K. (2007). India in the knowledge economy – an electronic paradigm, *International Journal of Educational Managem*ent, *21*(6), P. 543-568.

Bosu, R., (2000). Availability and Utilization of Educational Technology in the University of Cape Coast. Retrieved 13th March, 2015 from https://www.google.com.gh/search?tbm=bks&hl=en&q=Bosu%2C+R%2C+%282000%29.+Availability+and+Utilization+of+Educational+Technology+in+the+University+of+Cape+Coast.#hl=en&tbm=bks&q=Asante%2C+A.%2C+%282000%29.+A+Survey+into+the+use+of+Computers+in+the+Teaching+and++++++Learning+of+++Mathematics%2hana%2C+2000 04/1/MENSAH%202009.pdf

Brian, K. W., & Sawyer, C. S. (2003). *Using Information Technology* (5th ed.). McGraw-Hill, New York.

British Educational Communications and Technology Agency (BECTA) (2003). What the research says about using ICT in maths. Retrieved 19th June, 2008 from www.becta.org.uk/research.

British Educational Communications and Technology Agency. (2003). The secondary school of the future: A report to the Department for Education and Employment. Retrieved 5th January, 2013, from http://www.becta.

Burns, R. B. (2000). Introduction to Research Methods (4th ed.). London: Sage.

Cabero, J. (2001). *ICT training of university teachers in a Personal Learning Environment.* University of Córdoba, Spain.

Cawthera, A. (2001). *Computers in secondary schools in developing countries: Cost and Other Issues.* Retrieved March 24, 2008, from http://www.google.com.gh/search?hl=en&q=Cawthera%2C+A.%2C28 2004%29.++Computers+in+secondary+schoolsin+developing+countri esIssues&btnG=Search.

Chiriswa, P. (2002). An investigation into the Probable Factors Responsible for Poor performance in Kenya Certificate of Secondary Education (KCSE) in Vihiga District of Western Province, Kenya. Retrieved 20th October, 2015, from http://www.sciencepublishinggroup.com/journal/ paperinfo.aspx?journalid=193&paperId=10001060

Coates, D., Humphreys, B. R., & Kane, J. (2004). No Significant Distance between Face-to-face and Online Instruction: Evidence from Principles of Economics. *Economics of Education Review*, 23(6), P. 533-546.

Collis, B. (2001). Using information technology to create new educational situations. *UNESCO International Congress on Education and Informatics.*

Cox, M. J., Preston, C., & Cox, K. (1999). *What Motivates Teachers to use ICT*? Paper presented at the British Educational Research Associate Conference. Brighton University of Sussex at Brighton.

Cubukcuoglu, B. (2013). Factors enabling the use of technology in subject teaching *International Journal of Education and Development using Information and Communication Technology (IJEDICT),* 9(3), P.50-60

Daniels, J. S. (2002) "Foreword" in Information and Communication Technology in Education – *A Curriculum for Schools and Programme for Teacher Development.* Paris: UNESCO.

Dankwa, K. A. (1997). SchoolNet: A catalyst for transforming education in Ghana. Retrieved 16th July, 2008 from http;//www.isoc.org/isoc/whatis/ conferences/inet/96/proceedings/c6/c6_1.htm.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982-1003.

Davis, N. E., & Tearle, P. (Eds.). (1999). A core curriculum for telematics in teacher training. Available:

www.ex.ac.uk/telematics.T3/corecurr/tteach98.htm

Derbyshire, H. (2003). *Gender issues in the use of computers in education in Africa*. Retrieved 25th January 2008 frohttp://imfundo.digitalbrain.com/ imfundo/web/learn/documents/Gend%20Report.pdf.

Dilli, R. N. (2007). *Teacher Effectiveness in Relation to Work Satisfaction, Media Utilization and Attitude towards the Use of Information and communication Technology among Secondary School Teachers of Nepal*. Retrieved 20th June, 2005 from https://www.google.com. gh/url?TEACHERS%27_AND_STUDENTS%27_ATTITUDES_TOW ARD_THE_USE_OF_MODERN_INFORMATION_AND_COMMUN ICATION_TECHNOLOGY_ICT%2Flinks.

Dogan, M. (2010). Primary trainee teachers' attitudes to and use of computer and technology in mathematics: The case of Turkey', *Educational Research and Review, 5*(11), P. 690-702.

Fraenkel, J. R., & Wallen, N. E. (2000). *How to design and evaluate research in education* (4th ed.). USA: McGraw-Hill Companies Inc.

Fletcher, J. D. (2003). Evidence for learning from technology-Assisted Instruction. *Technology Applications in education: A learning view*. Hillsdale, NJ: Lawrence Erbaum Associates.

Fox, W., & Bayat, M. S. (2007). A Guide to Managing Research. Cape Town: Juta Publications.

Fuchs, P., & Woessman, I. (2004). Computers and Student Learning: Bivariate and Multivariate Evidence on the Availability and Use of Computers at Home and at School, *CESifo Working Paper*. No. 1321.

Getachew, Y. (2001). Access and Utilisation of ICTs: The Case of Distance Education in Ethiopia. Retrieved 1st November, 2004 from www.ethiopiaknowledge.org.

Ghana ICT Accelerated Development Policy, (2003). Accra: Graphic Communications Group Limited. Retrieved 20th June, 2015 from uhttp://www.foundation-partnership.orgs/pubs/ict.index.php.

Gray, D. S., & Souter, N. (2004). *Secondary science teachers' use of and attitude towards ICT in Scotland*. A Report, University of Strathclyde: Glasgow, UK.

Haddad, W. D. (2003). Is instructional technology a must for learning? *TechKnowLogia*, *1*(1), P. 5-6.

Hawkins, R. (2002). Interview with the outgoing World Africa Programme Co-ordinator in Washington DC. Retrieved 13th January, 2008 from http://www.checkpoint-elearning.com/article/3935.html.

Heeks, R. (2000). *Development Informatics: Working paper series, Paper no. 5: Information and communication technologies, poverty and development*. Institute of development Policy and Management: University of Manchester.

Hennessy, S., Harrison D., & Wamakote, L. (2010). Teacher Factors Influencing Class-room Use of ICT in Sub-Saharan Africa. *Itupale Online Journal of African Studies, 2*(1), 39-54.

Hepp, K. P., Hinostroza, S. E., Laval, M. E., & Rehbein, L. F. (2004). Technology in Schools: *Education, ICT and the Knowledge Society* OECD. Retrieved 13th, August, 2014 from *www1.worldbank.org/educa tion/pdf/ICT_report_oct04a.pdf.*

Jhurreev, V. (2005). Technology Integration in Education in Developing Countries: Guidelines to Policy Makers. *International Education Journal,* 6(4), P. 467-483.

Jonassen, D., & Reeves, T. (1996). Learning with technology: Using computers as cognitive tools. In D. Jonassen (Ed.), *Handbook of Research Educational on Educational Communications and Technology* (P. 693-719). New York: Macmillan.

Kante, C., & Savani, V. (2003). E-learning: The New Frontier in the Developing World. Retrieved 13th Mach, 2013, from http://www. techknowlogia. org/TKL_Articles/PDF/458.pdf.

Kennewell, S., Parkinson, J., & Tanner, H. (2000). *Developing the ICT capable schoo*l. London: Routledge Falmer.

Kula, A. (2010). Barriers for ICT Integration, Strategies Developed against Them and Cases in Turkey Retrieved December 17, 2011 from http://meb.academia.edu/.

Kulik, J.A. (1994), *Meta-Analysis Study of Findings on Computer-Based Instruction, Report on the Effectiveness of Technology in Schools, 1990-1997.* Software Publishers Association.

Kulik, J. (2003). Effects of using instructional technology in elementary and secondary schools: What controlled evaluation studies say (Final Report No. P10446.001). *Arlington, VA: SRI International.*

Leedy, P. D. (2001). *Practical Research Planning and Design*. 6th ed. Columbus: Princeton.

Leedy, P. D., & Ormrod, J. E. (2001). *Practical Research: Planning and Design*. Upper Saddle River: Prentice-Hall.

Lemke, C., & Coughlin, E. C. (1998). Technology in American schools. *Available: www.mff.org/pnbs/ME158.pdf.*

Mapaderun, O. (2002). *Teaching Method for Business Science, Social Science and Technical Education*, Ibadan: Holyem Communications

McCarney, J. (2004). Effective use of staff development in ICT. *European Journal of Education, 27*(1), P. 61-72.

Mevarech, A. R., & Light, P. H. (1992). Peer-based interaction at the computer: Looking backward, looking forward. *Learning and Instruction*, *2*(1), P. 275-280.

Mooij, T., & Smeets, E. (2001). Modeling and supporting ICT implementation in secondary schools. *Computers in education, 36*(3), P. 265-281.

Murray, J. (2011). Cloud network architecture and ICT - Modern Network Architecture. *ITKnowledgeExchange*. TechTarget.

Newhouse, P. (2002). *The impact of ICT on learning and teaching*. Perth, Western Australia: Department of Education.

New Media Consortium (2007). Horizon Report. Retrieved July 1st, 2007 from *www.nmc.org/pdf/2007_Horizon_Report.pdf.*

Niederhauser, D. S., & Stoddart, T. (2001). Teachers' instructional perspectives and use of educational software. *Teaching and Teacher Education 17*(1), P. 15–31.

OECD (2001). Organisation for Economic Development and Cooperation: *Understanding the digital Divide, 34*(2), P. 50-57.

O'Leary, T. J., & O'Leary, L. I. (2005). *Computing Essentials*. McGraw-Hill. New York.

Osuala, E. C. (2005). *Introduction to Research Methodology*. Onitsha: Africana-First Publishers Ltd.

Paul, A. A., Rosnold, O. O., & Adeyinka, T. (2007). Attitudes of Librarians in Selected Nigerian Universities toward the Use of ICT. Library Philosophy and Practice (e-journal) University of Nebraska – Lincoln. Retrieved 10th June, 2014 from http://digitalcommons.unl.edu/libPhilPrac/159.

Pedro, H. K., Hinostroza, S., Enrique, T.; Laval, M., Rehbein, F., Lucio, Y. (2004). *Technology in Schools: Education, ICT and the Knowledge Society OECD*. Retrieved 13th May, 2014 from www.worldbank.org/education/pdf/ICT_report_oct04a.pdf.

Pelgrum, W. J., & Law, N. (2003).ICT in Education around the World:Trends, Problems and Prospects. UNESCO-*International Institute for Educational Planning*. Retrieved 20th May, 2014 from *www.worldcatlibraries.org/wcpa/ow/02d077080fcf3210a19afeb4da09e526.html.*

Plomp, T., Pelgrum, W. J., & Law, N. (2007). 'SITES2006—International comparative survey of pedagogical practices and ICT in education', *Education and Information Technologies, 12*(2), P. 83- 92.

Polit, D. F., & Beck, C. T. (2007). Nursing Research Principles' and Methods (7th ed.). Saratoga Spring: New York.

Quinn, B. (1995). Reducing stressful aspects of information technology in public services. *Public and Access Services Quarterly*, *1*(4), P. 1- 34.

Rao, O. (2004). *How real is the Internet Market in Developing Countries?* Retrieved 24 February, 2009 from http://www.planestsia.com.

Raseroka, K. (1997). Challenges of interactive environment in the context of developing countries in Sub-Saharan Africa. *International information and library review*, 29 (1), P. 487-499.

Romiszowiski, A. J. (1998). The Selection and the Use of Instructional Media. NY: Kogan Page.

Robert Gordon University Aberdeen (2004*). Teachers ICT skills and knowledge needs*. Final Report to SOEID Section Three. Retrieved 10th 2008 from www.rguedu.org.

Sanyal, B. C. (2001). New functions of higher education and ICT to achieve education for all, Paper prepared for the Expert Roundtable on University and Technology-for- Literacy and Education Partnership in Developing Countries, *International Institute for Educational Planning*, UNESCO, September 10 to 12, Paris.

Sharma, R. (2003). Barriers in Using Technology for Education in Developing Countries, IEEE0-7803-7724-9103.Singapore schools, *Computers & Education,* 41(1), P. 49--63.

Sparks, J (1989) Pedagogic Difference Between Media' In Bates, A(ed.) *The Role of Distance Education in National and International Development*: *An Overview. Distance Education.10* (1). P. 55-56.

Stephenson, J. (2001). Learner-managed learning- an emerging pedagogy for online learning. Teaching and Learning Online: *Pedagogies for New Technologies*. London, Kogan Page.

Tamilselvan, N., Sivakumar, N., & Sevukan, R. (2012). Information and Communications Technologies: *International Journal of Library and Information Science, 1*(1), P. 15 – 28.

Tella, A., Tella, A., Toyobo, O. M., Adika L. O., & Adeyinka, A. A. (2007). An assessment of secondary school teachers' uses of ICTs: Implications for further Development of ICT's use in Nigerian secondary schoo*l. Turkish online Journal of Educational Technology, 6*(3), 5-16.

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey, *Australasian Journal of Educational Technology*, *24*(4), P. 413- 424.

The Association of African Universities (2000). Technical Experts Meeting on the use and Application of Information and Communication Technologies in Higher Education Institutions in South Africa. Retrieved 19th September, 2001. http://www.aau.org/english/documents /aau-ictreport-p3.htm.

UNESCO (2002). Information and Communication Technology in Education– *A Curriculum for Schools and Programme for Teacher Development*. Paris: UNESCO.

UNESCO, (2004). *ICT pedagogy*. Retrieved 11th October, 2015 from http://www.unescobbk.org/education/ict/schoolnet.

Valasidou, A., & Bousiou-Makridou, D. (2005). Guidelines for the Design and Implementation of E-Learning Programmes, Proceedings of the IADIS. *International Conference IADIS E-Society* 2005. Qawra, Malta.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), P. 186-204.

Webb, M. E. (2002). Padegogical reasoning: Issues and solution for teaching and learning of ICT in secondary schools. *Education and Information Technologies*, 7(3), P. 237-255.

Wilson, G. B. (2008). *First course in ICT literacy* (1st ed.). Wilbay publishers: Cape Coast.

Yeya, M. S. (2002). *Aninvestigation of the probable causes of poor performance in K.C.S.E in Matunga division, Kwale district, MED project*. Kenyatta University.

Young, J. (2002). The 24-hour professor. The Chronicle of Higher Education, *48*(38), P. 31-33.

Yuen, A., Law, N., & Wong, K. (2003). ICT implementation and school leadership Case studies of ICT integration in teaching and learning. *Journal of Educational Administration, 41*(2), P. 158-170.

Yusuf, M. O. (2005). Information and communication education: Analyzing the Nigerian national policy for information technology. *International Education Journal,* 6(3), P. 316-321.

Yusuf, M. O., & Onasanya, S. A. (2004). Information and communication technology (ICT) and teaching in tertiary institutions. Retrieved 5th January,2013, from http://unilorin.edu.ng/publications/onasanya/ICT%2 0AND%20TEACHING%20IN%20TERTIARY%2.

APPENDIX A

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION (CODE)

QUESTIONNAIRE TO SOLICIT STUDENTS OPINION ABOUT ASSESSMENT OF ICT UTILIZATION IN SENIOR HIGH SCHOOLS IN ASIKUMA-ODOBEN-BRAKWA DISTRICT

This questionnaire is aimed at obtaining information on the above heading. The purpose is intended to address only educational issues. Questionnaire to be administered will not probe into personal issues or fault findings. An empirical data basis for assessing ICT utilization in Senior High Schools in Asikuma-Odoben-Brakwa district would be based on your loyal indulgence in responses. You are kindly requested to respond truthfully and objectively to the items provided, everything will be treated confidentially.

You are please required to tick **[√]** or write most appropriately to the response as befit your status. Thank you for accepting to complete this questionnaire.

Thank you in advance.

SECTION A

BIOGRAPHIC DATA OF RESPONDENTS

1. Name of School: …………………………………………….....................

2. School status
   Government [   ]
   Private   [   ]

3. Gender
   Male   [   ]
   Female   [   ]

4. Age
   15 years and below [   ]
   16 years   [   ]
   17 years   [   ]
   18 years and above [   ]

5. Your Form/Class
   Form two   [   ]
   Form three [   ]

6. Which course are you pursuing?
   Science   [   ]
   Business   [   ]
   Arts   [   ]
   Home Economics [   ]
   Others (please specify) ……………………………

7. Do your parents have computer in the house?
   Yes   [   ]
    No   [   ]

8. How many years have you been using computers?
   1-2 years   [   ]
   3-4 years   [   ]
   5-6 years   [   ]
   More than 6 years [   ]

9. Who taught you about computers?
   Myself   [   ]
   My teachers [   ]

My friends   [   ]
My family   [   ]

10. How often do you use your computer?

Always   [   ]

Occasionally [   ]

Rarely   [   ]

SECTION B

What is the degree of availability of ICT facilities in your school?

1. Does your school have ICT laboratory?
    Yes [   ]
    No   [   ]

2. If yes, how many ICT laboratories are in your school?
    One   [   ]
    Two   [   ]
    Three   [   ]

3. Do you have computers in your ICT laboratory?
    Yes [   ]

    No   [   ]

4. Do you have internet connectivity in your school?
    Yes [   ]
    No   [   ]

5. Do you have printer in your school?
    Yes [   ]

    No   [   ]

6. If yes, where in your school can you find a printer?

    Staff common room   [   ]

    School administration [   ]

    ICT laboratory   [   ]

    Classroom   [   ]

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7. Do you have projector in your school?

    Yes   [   ]

    No   [   ]

8. Have you seen a photocopier in your school before?

    Yes   [   ]

    No   [   ]

9. If yes, where ……………………………………………………

10. Does your school have television set that teachers use for teaching?

    Yes [   ]

    No   [   ]

11. Does your school have educational software for teaching?

    Yes   [   ]

    No   [   ]

12. Do you have Satellite disc for distance viewing of foreign programmes?
    Yes [   ]
    No   [   ]

13. Where do you use computers in the school?

    Staff common room   [   ]

    School administration   [   ]

    ICT laboratory   [   ]

    Classroom   [   ]

SECTION C

What is the degree of adequacy of ICT facilities and services in your

school?

1. Are the laboratory stocked with adequate computers that are
   functioning?
   Yes [   ]

   No [   ]

2. If yes, how many students use the computers at a time?

   ……………………………………………………………………………

3. Are the printers, photocopiers and projectors adequately serving

   students in your school?

   Yes [   ]

   No [   ]

4. Does your school have enough educational software for teaching?

   Yes [   ]

   No [   ]

5. Do enough students have access to the school internet?

   Yes [   ]

   No [   ]

6. Do you have access to computer one-on-one?

   Yes [   ]

   No [   ]

SECTION D

To what extent are students able to have easy access to ICT facilities in their schools?

Please tick [√] the appropriate box

SN	Statements	Freque-ntly	Occasi-nally	Not used
1	How often do you access the ICT laboratory?			
2	Do you normally use computers in your ICT lessons?			
3	Do you have enough time to practice the computer during and after the lesson?			
4	How often do you use internet facility in the school?			
5	Do you use internet to do your research work?			
6	How often do you use satellite disc for distance viewing of foreign programmes			
7	How often do you use e-mail to communicate			
8	Do you have access to the school printer to print your document?			
9	How often do you use the school photocopier?			
10	Do teachers use the projector during teaching?			
11	Do teachers use educational software for teaching?			
12	Do you sometimes use educational software for your studies?			
13	Do you have access to school internet?			
14	Do you use the ICT laboratory after school?			
15	Is the ICT laboratory open for students during the week ends?			

SECTION E

What are the attitudes of students towards ICT usage in teaching and

learning environment?

Please tick [√] as appropriate the extent to which you Agree, Disagree,

Strongly Agree, Undecided, and Strongly Disagree

5 = Strongly Agree (SA)
4 = Agree (A)
3 = Undecided (U)
2 = Disagree (D)
1 = Strongly Disagree (SD)

Statement	SA 5	A 4	U 3	D 2	SD 1
1. ICT do not scare me at all					
2. I would like working with computers					
3. ICT lessons are a favourite subject for me					
4. I pay attention during ICT lessons at the computer laboratory					
5. I want to learn a lot about ICT					
6. A computer test would scare me					
7. I like working on a computer					
8. Computers are not exciting me					
9. Studying about ICT is a waste of time					
10. ICT is not exciting					
11. Computers intimidate and threaten me					
12. ICT is difficult to understand					
13. Working with computers make me feel tense and uncomfortable					
14. I enjoy learning how ICT is used in our daily lives					
15. I feel apprehensive about the use of computers in the laboratory					
16. I don't pay attention when am learning in the ICT laboratory					

SECTION F

What are perceptions of students towards ICT usage in teaching and

learning environment?

Please tick [√] as appropriate the extent to which you Agree, Disagree, Strongly Agree, Undecided, and Strongly Disagree

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. Do you know using computers in teaching and learning process has some benefits?					
2. Using ICT makes lessons more interesting					
3. Using ICT in teaching and learning process Is enjoyable					
4. Using ICT makes the lesson more fun					
5. Using ICT makes the lesson more diverse					
6. Using ICT improves presentation of Materials.					
7. Using ICT makes lesson more difficult.					
8. Using ICT reduces my motivation					
9. Using ICT impairs my learning					
10. Using ICT makes lessons more understanding					
11. ICT make learning more effective					
12. ICT help to meet the varying needs of students					

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APPENDIX B

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION (CODE)

QUESTIONNAIRE TO SOLICIT TEACHERS AND ICT TECHNICIANS VIEWS ABOUT ASSESSMENT OF ICT UTILIZATION IN SENIOR HIGH SCHOOLS IN ASIKUMA-ODOBEN-BRAKWA DISTRICT

This questionnaire is aimed at obtaining information on the above heading. The purpose is intended to address only educational issues. Questionnaire to be administered will not probe into personal issues or fault findings. An empirical data basis for assessing ICT utilization in Senior High Schools in Asikuma-Odoben-Brakwa district would be based on your loyal indulgence in responses. You are kindly requested to respond truthfully and objectively to the items provided, everything will be treated confidentially.

You are please required to tick **[√]** or write most appropriately to the response as befit your status.

Thank you for accepting to complete this questionnaire.

SECTION A

BIOGRAPHIC DATA OF RESPONDENTS

1. Name of School: …………………………………………….......................

2. School status
    Government [   ]
    Private   [   ]

3. Gender
    Male   [   ]
    Female [   ]

4. Age
    Below 25 years   [   ]
    25-34 years   [   ]
    35–44 years   [   ]
    Above 54 years   [   ]

5. Marital Status
    Single   [   ]
    Married   [   ]
    Separated [   ]
    Divorced   [   ]
    Widowed   [   ]

6. Educational Background
    HND degree   [   ]
    First degree in Education   [   ]
    First degree Without Education [   ]
    Master's degree   [   ]

7. Years of teaching experience
    Below 5 years   [   ]
    6-10 years   [   ]
    11 – 20 years   [   ]
    Above 20 years   [   ]

8. What is your main field of study?
    Science   [   ]
    Business   [   ]
    General Arts   [   ]
    Home Economics [   ]
    ICT   [   ]
    Others, (please specify) …………………………………………….

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9. Do you have computer in the house?
   Yes   [   ]
   No   [   ]

10. How many years have you been using computers?
    Less than one year [   ]
    1-3 years   [   ]
    4-6 years   [   ]
    More than 6 years   [   ]

SECTION B

What is the degree of availability of ICT facilities in your school?

14. Does your school have ICT laboratory?
    Yes [   ]
    No [   ]

15. If yes, how many ICT laboratories are in your school?
    One   [   ]
    Two   [   ]
    Three   [   ]

16. Do you have enough computers in your ICT laboratory?
    Yes [   ]
    No   [   ]

17. Do you have internet connectivity in your school?
    Yes [   ]
    No   [   ]

18. Do you have printer in your school?
    Yes [   ]
    No   [   ]

19. If yes, where in your school can you find a printer?
    ICT laboratory   [   ]
    School administration   [   ]
    Science laboratory   [   ]
    ISM laboratory   [   ]

20. Do you have projector in your school?
    Yes   [   ]
    No   [   ]

21. Have you seen a photocopier in your school before?
    Yes   [   ]
     No   [   ]

22. If yes, where ……………………………………………………

23. Does your school have television set that teachers use for teaching?
    Yes [   ]
    No   [   ]

24. Does your school have educational software for teaching?
    Yes   [   ]
     No   [   ]

25. Do you have Satellite disc for distance viewing of foreign programmes?
    Yes   [   ]
     No   [   ]

26. Where do you use computers in the school?
    Staff common room   [   ]
    Administrator's office   [   ]
    Classrooms   [   ]
    ICT laboratory   [   ]

SECTION C

What is the degree of adequacy of ICT facilities and services in your school?

7. Is the laboratory stocked with adequate computers that are functioning?
    Yes   [   ]
     No   [   ]

8. If yes, how many students use the computers at a time?

    ……………………………………………………………………………

9. Are the printers, photocopiers and projectors adequately serving students in your school?
    Yes   [   ]
     No   [   ]

10. Does your school have enough educational software for teaching?

    Yes   [   ]

     No   [   ]

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11. Do enough teachers use the school internet?

    Yes [   ]

     No [   ]

12. Do you use projector in your teaching?

    Yes [   ]

     No [   ]

SECTION D

To what extent are Teachers able to have easy access to ICT facilities in

their schools?

Please tick [√] the appropriate box

SN	Statements	Frequently	Occasionally	Not used
1.	How often do you access the ICT laboratory?			
2	Do you normally use computers in your ICT lessons?			
3	Do you have enough time to practice the computer during and after the lesson?			
4	How often do you use internet facility in the school?			
5	Do you use internet for browsing and doing your research work?			
6	How often do you use satellite disc for distance viewing of foreign programmes			
7	How often do you use e-mail to communicate			
8	Do you have access to the school printer to print your document?			
9	How often do you use the school photocopier?			

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SECTION E

What are the teachers' perceptions about the ICT for teaching and

personal use?

Please tick [√] as appropriate the extent to which you Agree, Disagree, Strongly Agree, Undecided, and Strongly Disagree

5 = Strongly Agree (SA)
4 = Agree (A)
3 = Undecided (U)
2 = Disagree (D)
1 = Strongly Disagree (SD)

N/O	Statement or items	SA	A	U	D	SD
1	Using ICT makes it more difficult to control the class.					
2	ICT makes the lesson more difficult.					
3	ICT makes preparation of the lesson more difficult.					
4	Hardware and software problems often. disrupt the lesson					
5	Using ICT in teaching is expensive.					
6	Using ICT makes lessons more interesting					
7	Using ICT in my teaching and learning is not enjoyable					
8	Using ICT makes the lesson more fun					
9	Using ICT makes the lesson more diverse					
10	Using ICT improves presentation of Materials.					
11	Using ICT makes lesson more understanding					
12	Using ICT reduces students motivation					
13	Using ICT impairs students learning					
14	Using ICT motivate students to learning					

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SECTION F

A. **How often do teachers use of ICT for teaching and personal use?**

Please tick [√] the appropriate box

SN	Statements	Very often	Often	Rarely	Never
1.	How often do you use the ICT laboratory for your lessons?				
2	Do you normally use computers in your ICT lessons?				
3	Do you have enough time to practice the computer during and after the lesson?				
4	How often do you use internet facility in the school to facilitate your lesson?				
5	Do you use internet for your research work when preparing your lessons?				
6	How often do you use e-mail to communicate with students?				
7	How often do you use the school photocopier?				
8	Do teachers use the projector during teaching?				
9	Do you use educational software for teaching?				
11	How often do you use PowerPoint presentation in your lesson delivery?				
12	Do you use the school printer to print your documents?				

B. Teachers' use of ICT Facilities

(Please check all that apply)

SN	Statements	Yes	No
1.	I can boot the computer		
2	I use the computer to teach my students		
3	I use the computer to keep records		
4	I use Microsoft Word to type questions and other documents		
5	I use Microsoft Excel to teach basic mathematics		
6	I use PowerPoint in presenting my lesson		
7	I browse the Internet to get materials for teaching		
8	I have an e-mail address		
9	I can use a search engine such as google, yahoo etc		
10	I use education software such as CAI for teaching		
11	I can set up a database using MS Access		
12	I can use a scanner to copy images		
13	I can operate a printer that is connected to the computer		
14	I can set up a multimedia projector		
15	Do you maintain a personal web page as teaching tool?		

SECTION G

In what ways will you promote and embed the effective use of ICT in teaching and learning environment?

Please tick [√] the appropriate box

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. I will research on topics to be taught using the internet in addition to the information in textbooks					
2. Use PowerPoint presentation to deliver my lessons					
3. I will use video to give students firsthand experience in lessons					
4. Communicate with students via email on materials students should read for classroom discussion.					
5. Can you use email to give students projects to research on in future?					
6. Allow students to present their assignment via emails if they are unable to attend classes or during vacation					
7. Is it safer to integrate computer in continuous assessment scores generations as teacher?					
8. Use database create and maintain basic information about students in a class					
9. Use spreadsheet to produce graphs and students task to show relationships					
10. Use computer graphics as a cue or primary information in teaching new topic					
11. Allow students to print their assignment using the ICT laboratory printer					