UNIVERSITY OF EDUCATION WINNEBA.
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF ICT EDUCATION.

THE USE OF ICT FOR TEACHING AND LEARNING IN SENIOR HIGH SCHOOLS IN GHANA: A COMPARATIVE STUDY OF BUEMAN SENIOR HIGH SCHOOL AND PRESBYTERIAN SENIOR HIGH SCHOOL, JASIKAN.

APPIAH KUBI SOLOMON

(5171570054)

AND

ADAWURAH MATHIAS

(5171570050)

A SURVEY PRESENTED TO THE DEPARTMENT OF ICT EDUCATION, UNIVERSITY OF EDUCATION, WINNEBA, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF BACHELOR OF SCIENCE IN ICT EDUCATION.

SEPTEMBER, 2021

DECLARATION

CANDIDATE'S DECLARATION

We hereby declare that this survey is the result of our own original research and that no part has been presented for another degree in the University of Education, Winneba or elsewhere.

Signature: …… Date: ……

(SOLOMON APPIAH KUBI)

Signature: …… Date: ……

(ADAWURAH MAATHIAS)

SUPERVISOR'S DECLARATION

I hereby declare that the preparation of this Survey was supervised in accordance with the guidelines on supervision of Research laid down by the University of Education, Winneba.

Name: DR WILSON OSAFO APEANTI

Signature: …… Date: ……...

DEDICATION

This study is dedicated to Mr. Kotoka Nelson, Madam Esther Quaye and our colleagues Acheampong Godfred and Adu-Boahen Samuel, whose divergent support and encouragement have made us what we are today not forgetting our lovely friend Mensah Micheal.

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ABSTRACT

This study is a comparative study to investigate the use of ICT for teaching and learning in Bueman Senior High School and Presbyterian Senior High School, Jasikan Municipality within the Oti-region of Ghana. The above two (2) schools were chosen because not much of such study has been conducted in this part of the District. The objectives of the study is to assess the challenges related with the use of ICT in Bueman senior high school and Presbyterian Senior High School, the perception of teachers and students of Bueman Senior High School and Presbyterian Senior high School and the availability of infrastructure for the use of ICT for teaching and learning in Bueman Senior High School and Presbyterian senior high School. Data from the field was collected through the use of questionnaire. From the sample area of study, there were in all 44 respondents including students and Teachers whom were randomly selected to fill the questionnaires designed for them. Data was analysed using descriptive statistics and the findings further indicated that ICT integration/ the use of ICT for teaching and learning realized some challenges such as lack of an ICT laboratory, Unreliable network, lack insufficient software and hardware and lack of technical support. The findings also indicated that the perception of teachers and students is positive about the integration of ICT in teaching and learning.

These barriers have hindered successful implementation of ICT into teaching and learning processes. The study also recommended that government and other Non-governmental organizations should come to the aid of such schools and support them with infrastructure to aid lesson delivery. The study also recommended that and also teachers should be given sufficient training on how to use ICT tools to enhance teaching and learning in schools. Finally, further research on the perception of teachers and students towards the use of ICT in enhancing teaching and learning and relevant strategies for using ICT to improve teaching and learning practices should be conducted.

CHAPTER 1
INTRODUCTION

1.0 Introduction

This chapter provides brief introduction of the study, background of the study, statement of the problem, research objectives, research questions, significance of the study, limitations of the study, organization of the study and expected outcomes.

1.1. Background to the study

The world today is highly impacted with the use of information communication and technology and has penetrated every facet of life and for this reason; it is widely embraced in the society.

For a country to be classified as developed or advanced, it is an undisputable claim that Information and Communication Technologies play a vital role in making it a success. Mathew (1997) (online) state that, the use of information and communication technology in an increasing demand is shaping our ways of live including reducing workload, how we go about our daily activities and making live extra simple. As such, our success as individuals or nation depends on our ability to understand and use I.C.T (computer) especially in the field of education. "The importance of technology to modern concepts such as e-commerce, teleconferencing, e-governance, and telecommunication have all arisen as a result of the application of technology in almost every aspect of human endeavor" (Amoaful, 2011). Countries all over the world, including Ghana have identified the pivotal role ICT plays in all aspects of human endeavor of which education forms a part. To counter the industrial and societal development, nations are drafting programs and guidelines that integrate the application of ICT or computer technologies into education. Several nations have set up national policies that show a synopsis of how ICT should be

implemented to improve the educational system in the various countries (Kozma, 2003). For mother Ghana to be able to equip students with skills for the modern day job market there is an increasing demand of educational establishments to foster in the younger generation (schools) information communication technology. The evidence from several studies has proven beyond reasonable doubt that, in the field of education application of computer technologies can improve teaching and learning.

As posited by Fathima (2013) revealed the use of ICT in learning environment can bring about a rapid change in the student‘s performance. The ideology that ICT can for a fact improve education and learning has compelled the Government of Ghana to draft guidelines geared towards the integration of ICT in education. Having noticed the impact of ICT on education towards national development, the Government in 2007 introduced a new educational reform which stressed on the requirement for more significance of ICT in education. This prompted the incorporation of ICT in both the Basic and Secondary School's educational module where the subject is presently an examinable one.

ICT as a tool for teaching and learning in education generally means technology-based teaching and learning process that closely relates to the utilization of learning technologies in schools. Due to the fact that students are familiar with technology and they will learn better within technology-based environment, the issue of using ICT for teaching and learning in schools, specifically in the senior high level is vital. This is because; the use of technology in education contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and supports from ICT elements and components (Jamieson-Proctor, 2013).

Education is at the core of every developing and developed nation. It has contributed immensely to the increase in development of knowledge and providing a welcoming atmosphere for advancement in building human capital needed for a possible development in the economy.

In other to fit education in these highly technological developments of the twenty-first century there is the need to channel technology through schools by integrating ICT in teaching and learning process. Many policy makers and government officials of countries like the United Kingdom, Australia, United State of America and Portugal are determined that their educational structure will take an 'inclusive'(Conventional) approach of teaching because they are beginning to understand the potential the conventional form of education can realized.

ICT is considered a basic tool in equipping and teaching students with the required abilities for the worldwide work place. The world now is full of revolution (Amoaful, 2011). This revolution is termed the computer revolution or information revolution in history books and journal articles. In this revolution, the computer is the agent transforming the way people do research, businesses as well as teaching and learning. Opuku (2016) postulated that the rate at which ICT is developing and its impact on socio-economic activities cannot be overemphasized. According to him, the United Nations Development Program (UNDP) expressed that ICT has been characterized to incorporate the full scope of electronic advancements and strategies used to manage information and innovations. Notwithstanding all the benefits ICT has got to offer, the system is fraught with challenges and one of the major problems associated with the integration of ICT in an academic environment is the inadequacy of ICT infrastructure to improve teaching and learning. Other challenges against the use of ICT by students and teachers are the lack of requisite skills necessary to operate computers and ICT gadgets in education. Similar studies have also indicated that, such barriers include network problems, user unfriendly programs and inadequate access to the internet which contribute to the disadvantages of using ICT in education.

In other related study the challenges facing integration of ICT into teaching and learning are classified into First- order or extrinsic factors and second-order or intrinsic barriers (Briker, 1995). First-order barriers include environmental or institutional issues and resources while second-order barriers related to a teacher's personal instructional beliefs, experiences and strategies. Teachers are faced with many difficulties due to these intrinsic which affect their decision-making processes and classroom practices. It is belief that teachers teach students based on their beliefs as individuals and if one believes teaching without the use of ICT is best to traditional approach then his students will be at a disadvantage. Some believe that the First-order barriers especially infrastructure is the main reason integration is failing but Poor professional development by Koehler (2009) and access to equipment by Yan and Zhao (2006) also contribute to first order barriers.

1.2. Statement of the problem

The adoption of ICT as a required instructional standard is one of the most effective developmental tactics in this era of change and reflects a worldview that is emerging from a desire to better prepare individuals for life after school (Aviram, 2004). The ICT revolution's speed has led to an exceptional and expedited advancement in the teaching and learning process, which has an impact on how students and teachers interact within the educational framework. These developments continue to be an essential component of education in Ghana at all levels of instruction. The Ghana Education Service has tried to achieve the goal of improving the quality of education through the use of ICT with the aid of some policies and the adaption of ICT as an examinable topic. The Greater Accra Regional Director of Education worked with Academic City University College to organize events like the two-month ICT teacher training program that took place in August 2017 at Academic City University College in Circle-Accra. The training was designed to increase teachers' proficiency with ICT tools, which will benefit pupils as a result. Despite all of these investments in ICT infrastructure, tools, and professional development to improve teaching in Ghana, it is clear that the potential for ICT to aid students' learning has not been attained. The

inadequate ICT tools at second cycle institutions, the teachers' lack of the necessary abilities, and the lack of enthusiasm among the majority of teachers in using ICT tools are what motivated this study. This study aims to investigate the perceived usefulness and usability of ICT in teaching and learning among teachers and students, to identify potential barriers to ICT integration in teaching and learning, and to develop solutions to improve effective and efficient use of ICT to enhance teaching and learning and improve secondary education.

1.3. The purpose/aim of the study

The purpose of this study is to investigate the use of ICT as a tool for teaching and learning in Bueman Senior High School and Presbyterian Senior High School.

1.4. Objectives of research

1.4.1 General objective

The general objective of this study is to investigate the use of ICT as a tool for teaching and learning in Bueman senior high school and Presbyterian Senior High School

1.4.2 Specific objective

Specifically, this research seeks:

- To assess the challenges related with the use of ICT in Bueman senior high school and Presbyterian Senior High School.
- To find out the perception of teachers and students on the use of ICT for teaching and learning in Bueman senior high school and Presbyterian Senior High School.
- To determine the availability of ICT infrastructure for teaching and learning in Bueman senior high school and Presbyterian Senior High School

1.5 Research questions

1. What are the challenges associated with the use of ICT for teaching and learning in Bueman senior high school and Presbyterian Senior High School?
2. What perceptions do teachers and students have on the use of ICT tool for teaching and learning in Bueman Senior High School and Presbyterian Senior High School?
3. What are the ICT tools available for teaching and learning in Bueman senior high school and Presbyterian Senior High School?

1.6 Significance of the study

This research study has the potential to contribute to existing research in relation to the obstacles preventing the use ICT in the teaching and learning process. This research is expected to benefit educators by extending the knowledge base that exists already, as it presents empirical evidence in relation to these barriers. The researcher believes that the findings of the study would be beneficial not only to the two schools under investigation, but to teachers in general, the Ghana Education Service and other agencies responsible for the formulating of ICT policies into teaching and learning curricula in schools in Ghana.

The discovery of this study will add to the benefit of society considering that ICT plays a vital role in education today. For researchers, practitioners and policymakers, the study will help them reveal critical areas in the educational procedures that numerous researchers were not able to investigate.

The result of these findings will improve upon the use of ICT in teaching and learning in Senior High Schools in Ghana of which Bueman Senior high School and Presbyterian Senior High School, Jasikan are inclusive.

1.7 Limitations of the study

Bueman Senior High School and Presbyterian Senior High School, Jasikan were used for the study due to their proximity to the researcher and also due to the fact that not much related research has been conducted within the Jasikan Municipal Assembly in the Oti-region of Ghana.

The study focused on teachers, first and second year students of Bueman Senior High School and Presbyterian Senior High School, Jasikan. There have been several technological developments and changes that the institution has undergone with first and second year students were privy to during their stay in the various schools.

The research should have covered students and teachers in all Senior High Schools in Ghana but time allocation for this study did not permit for a larger population to be covered. For this and other reasons the researcher concentrated on teachers and first and second year students of both schools as the target population for the study.

1.8 Organization of the study

The study is organized into five (5) different chapters. The first chapter talks about the background to the study, the statement of the problem, the research objectives and questions. Also this same chapter continues to also deals with the significance of the study, the limitation encountered in the study. The second chapter deals with the review of the related literature. The third chapter talks about the research methodology that was used in the study. The fourth chapter dealt with the presentation and analysis of the data that was collected. It also discussed the data that has been analyzed. The last chapter talks about the summary of findings, the conclusions that were drawn and the recommendations.

CHAPTER 2
LITERATURE REVIEW

2.0 Introduction

The use of ICT as a tool for teaching and learning in the classroom has become paramount, as it pave ways for students to learn how to operate in an information age. The study of obstacles to the use of ICT in education may assist educators in overcoming barriers and support students in becoming successful technology adopters in the future. The use of ICT for teaching and learning in senior high schools is an area that has been covered extensively by other researchers all over the world. In relation to this work, related literature was reviewed to present the progress of research conducted in the use of ICT for teaching and learning.

Literature was reviewed under the following themes:

- Challenges of using ICT for teaching and learning.
- The perception of teachers and students on the use of ICT.
- Availability of ICT infrastructure for teaching and learning.

2.1 Challenges to the use of ICT in education

A challenge is an objection to something as not being true, genuine, correct, or proper. It is also referred to as anything that retards the progress or achievement of any set objective or aim. It therefore means that, eliminating one or more of these barriers in the use of ICT for teaching and learning will contribute positively to advance the process of integration in the second cycle institutions in Ghana. Bingimlas (2009) in a study found that teachers obviously have strong willingness of utilizing ICT in education, but some barriers are inevitable in the application of ICT.

In a research report conducted by British Educational Communications and Technology Agencies (BECTA) in 2004, a number of other important challenges were identified. These were: lack of confidence, accessibility, lack of time, fear of change and poor appreciation of the benefits of ICT.

In Africa, an empirical study conducted by Alemneh and Hastings (2006) conducted suggests the lack of trained teachers in the field of ICT who will impact into the intellect of students in secondary school as the major challenge which retards the integration of ICT for teaching and learning. It was stated in this same study that most of the instructor with such skills will like to go to other developed countries to work due to poor salaries and inadequate ICT infrastructure.

Bingimlas (2009) Discovered some main components that hinder the effective deployment of ICT by the teachers; low confidence, limited competence, and scarcity of access to resources. In addition, limited classroom management skills, poor administrative support and funding, and insufficient curriculum appear as minor components. It is believed that teaching and learning with the use of ICT as tool can only be successful if the above barriers are catered for.

Hsu (2016) also found four barriers of the use of ICT for teaching encountered by the Kindergarten through the Sixth Grade Teachers in the Midwestern United States; the students' lack of computer skills and the teachers' lack of training in technology, time to implement technology-integrated lessons, and technical support.

In Tanzania, a study by Kajuna (2009) and Ndume (2008) revealed the major challenges faced in technology instruction even at Higher Learning Institutions which include: insufficient of technical and academic staff with appropriate skills of technology use, unsupportive mindset, poor electricity connectivity and reliability, poor telecommunication network, expensive cost of internet access, low culture of education and learning styles. This is an indication that, even in the higher learning

Institutions and advanced countries there are still various major barriers related to the inclusion of ICT as a tool for teaching and learning.

In Ghana, the use of ICT in education is fraught with several challenges. Mereku (2009) found out that out of ten Ghanaian senior high schools in Ghana which had computer laboratories, the ones accessible to both students and teachers easily got damaged due to inoperative air-conditioners in the computer laboratories, power fluctuations, obsolete computers and malware attacks. The study also found out that none of the computer laboratories in the ten schools were connected to a server and only four computers out of twenty computers in one of the schools was connected to the internet. The availability of ICT infrastructure for teaching and learning can either make or unmake the effective integration of ICT into education possible according to the literature reviewed in this study.

According to Adebi-Caesar, Teye Emmanuel (2012) a full and complete integration of the use ICT in education requires high quality frequent training and professional development. If this training is not provided, then attempts at integration will inevitably be unsuccessful. This is significant, as according to most researchers another barrier that is frequently cited, is the lack of effective training. A study by Pelgrum (2001) revealed that there were not enough training opportunities for teachers in the use of ICTs in the classroom.

A full and complete integration of the use ICT in education requires high quality frequent training and professional development. If this training is not provided, then attempts at integration will inevitably be unsuccessful. This is significant, as according to most researchers another barrier that is frequently cited, is the lack of effective training. This analogy is quite understanding because one can’t give out

what he/she does not have. It will only take a well train instructor to be able to teach to the understanding level of his learners but not any other individual who was not train on how he can use ICT in his teaching process.

However, numerous studies have also proven that one of the reasons why the teacher is not able to use ICT in their teaching and learning has to do with lack of confidence. According to a BECTA reports in 2004, many teachers who are unskilled in ICT are not prepared to use them in the classroom or in front of students who might probably know more than them. This lack of confidence is further deepened with the expectation of students on the competence of the teacher in the use of ICTs. This is so because some Teacher thinks they will end up disgracing themselves before the students because most of them in this information age may know ICT better than they do.

According to numerous accounts, some teachers are concerned that computers may undermine or threaten their careers by diminishing their roles. The researcher is of the opinion that if teachers are trained in ICT and ICT integration, they should realize, that rather than downgrading pedagogical skills, ICT aims to enhance those skills, in the same way it aims to enhance the learning process and skills acquisition.

Also, Andy (2004) determined the lack of technical support was a barrier to successful integration of ICT for teaching and learning in schools. Lack of technical support discourages teachers from adopting and integrating technology in the classroom (Korte, 2007) . Becta (2004) agreed to that the lack of technical support and technical maintenance in schools is in the main problem in integrating ICT in schools.

Thus, this study concludes that insufficient time, lack of confidence, lack of training, fear and access to equipment as well as the lack of technical support are the main obstacles in using technology in the classroom.

The various Non-governmental organization (NGO's) and the Ministry of Education in partnership with the government of Ghana, according to the literature reviewed should create an enabling environment for non-profitable organizations and philanthropist to contribute to the provision of ICT infrastructure to deprived and rural schools within the country since it will be impossible for the government alone to bear all the cost of ICT integration in all senior high schools across the country.

In other related literature is was found out that, in Kenya and Ethiopia most of the teachers noted that they were unable to use ICT in their learning environment due to insufficient ICT resources whiles Namibia implies that in the rural and some part of the urban areas, basic equipment like desk and chairs are lacking and the unsteady voltage level, blackout and lack of ICT resources are the barriers to the implementation of ICT in the second cycle institution.

2.2 The perception of teachers and students on the use of ICT

According to Ministry of Education (2011) information and communication technologies are commonly defined in education as diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information. On the other hand, perception is an evaluative reaction to some referent or attitude object, inferred on the basic of the individuals' beliefs or opinions about the referent (Farren, 2015). The smartest technological tool in the world will be useless if it has no user. How often these tools are used in the school setting will be as a result of how the

teachers perceive such tools or equipment. As noted above, people's perceptions towards a new technology are a key element in its diffusion (Syomwene, 2017) ; (Rogers E. M., 2003). Rogers premise corroborates the general and widely accepted belief that attitudes affect behavior directly or indirectly (Zimbardo et al, cited by Asiri et al, 2012). Individuals' perceptions about a discipline will affect the way they go about learning, participating in such courses and the attitude of the person towards such discipline. Teachers' perception is a crucial factor in determining if and to what extent Technology is employed in the classroom situation. Those perceptions are what will keep a teacher informed about whether or not to implement a particular curriculum. Davis (1989) predicted there are two things that will let someone use a technological piece. The first have to do with "perceived usefulness" and the other "perceived ease of use". Perceive usefulness is how well the potential user beliefs the technological piece will enhance his/her daily activities and perceived ease of use also have to do with how much effort will be required by the potential user to use such an tool. A more recent study by Newhouse (2002) found that some teachers do not belief that computers have a useful educational objective. In an educational setting the teacher will only use an ICT tool in delivery if and only if he realizes the positive impact it will have on him the instructor and that of the learners.

It is crucial to note that; teachers' attitude plays an important role in influencing the effectiveness of the use of ICT for teaching and learning in education (Kusano et al., 2013). Voogt (2010) found that teachers who use technology extensively in their lessons tend to have a high level of confidence in pedagogical technology skills and focus on a learner-centered approach. They are more engaged in professional development activities and collaboration with colleagues than teachers who don't use technology very often. In order to change teachers' beliefs, schools must develop strong leaderships. Also, school principals should not only be an official supervisor, but a well train technology user and a

personal advisor to provide assistance to individual teachers and staffs (Kim, Kim, Lee, Spector, and DeMeester, 2013).

In study conducted in Scotland shows that many teachers recognize a range of benefits for pupils and themselves in using ICT (Williams et al, 2009). However, they turn to rather continue to ‚teach ICT than teach with ICT‘.

Andoh (2012) in his reference to a study of the Canadian Ministry of Education and its attempt to implement IT in schools in Ontario finds that:

“Canadian ministry officials estimated that only 20 percent of the teaching cohorts are at least moderately committed computer users and even this 20 percent may not be in favor of a dilution of the traditional curriculum model.” Andoh’s (2012) research indicated that the main factor leading to a high level of IT-usage was a school-wide consensus on the importance of IT use for students and the amount of teacher-teacher collaboration.

Buabeng-andoh (2012) however stated that in Ghana, study of teachers' perception in the utilization of ICT in education in second cycle institutions is limited as compared to senior high schools in developed countries. His study therefore spanned from teachers' perception, their perceived skills through to the extent of using ICT for teaching and learning. In the study, a greater percentage of the research participants strongly agreed that ICT can improve students ‘engagement in the educational process, assessment to educators and also increase students ‘participation.

In a study conducted by Guha (2000) on teachers’ perspective of the use of computer revealed time management and workload as barriers to making use of computer in classroom instruction. Further, lack

of technical support was reported to be another factor inhibiting the use of ICT in classroom (Preston, 2000). According to Bradley and Russell (1997), recurring faults, and the expectation of faults occurring during teaching sessions, are likely to reduce teachers' confidence and cause teachers to avoid using the technology thereby have succeeded in changing teachers' perception of the use of ICT in the classroom situation.

2.3 Availability of ICT infrastructure for teaching and learning

One of the major factors that play a central role in transforming learning for assessment practices in teaching and learning Information Communication Technology is infrastructure. It is globally recognized that teachers' students and even non-teaching staffs of various schools are now employing ICT in their daily activities and one can only do this with the help of the required infrastructure (Lowder, 2020).

Policy makers have been commended for the introduction of ICT into education especially in Senior High schools in Ghana due to the positive impact of ICT in teaching and learning integration (Mfum-Mensah O. , 2003). Dankwa (1997) claim that the provision of ICT to Senior High Schools is skewed in favor of the first class or category 'A' schools in the urban areas. Since the official introduction of ICT into second cycle institutions in the year 2007 the provision of educational resources have been directed to the cities or urban areas ignoring those institutions in the rural areas. Baglo Ridge Senior high school in the Oti-region cannot compare itself to a school like Presec-Legon in Accra. This explains the serious injustice meted out to some schools with regards to the distribution of ICT resources for teaching and learning (Mfum-mensah, 2003). This assertion was supported by Parthermore (2003) who revealed that there was a bias in the distribution of ICT infrastructure among senior high schools found in urban and rural centers. One major disadvantage on the side of students at the rural areas is that, at

the end of the course all the students will be given one set of exams to write and expected to work at the job market like other students from the urban area.

Most often than not, these schools in the rural areas are faced with a lot of problems such as the lack of qualified teachers, inadequate infrastructure and poor implementation of government policies. In other cases is the issue of lack or insufficient professional ICT teachers to deliver this course as most stakeholders will use teachers from other departments with no or little knowledge about the course to teach.

Ginsberg and McCormack 1998 as cited by Livigstone (2015) conducted a survey of 1163 teachers to discern what barriers teachers encountered in using computers. The responses to their survey indicated that issues surrounding computer hardware were the most serious barriers affecting its implementation. Some of this computer hardware includes television (TV), Radio, Overhead Projectors (OHPs), Computers, Laptops, Interactive white boards, PC tablets, PDAs and Networks

The ICT resources and facilities that will be investigated in this study includes electricity, laptops, desk computers, white boards, printers, Wi-Fi, scanners, modems, digital cameras, floppy disks, mouse, key boards, CPU's, CD-ROMs and projectors.

CHAPTER 3
METHODOLOGY

3.0 Introduction

This chapter talks about the methodology that was employed in the study. It is made up of the research design, the target population, and the sampling technique(s) or procedures that were employed. The chapter goes on to talk about the sample that was used in the study, the data collection method and the data collection instrument that was used. Lastly, the chapter also looks at the data analysis method employed.

3.1 Research design

The purpose of a research and its objectives determine the type of research design employed for a study (Kuntundu, 1998). Considering the nature of the research problem and purpose of this study, a descriptive, survey research design was chosen to investigate the use of ICT for teaching and learning in senior high schools in Ghana. The descriptive research will portray an accurate profile of people, events or situations (Robson, 1993).

3.2 Target population

A population is a complete set of elements (persons or objects) that possess some common characteristics defined by the sampling criteria established by the researcher. Also population is a comprehensive group of individuals, institutions; objects and so forth which have common characteristics that are the interest of a researcher. For this study the target population was made up of twenty-five (25) teachers and twenty-three (25) students of Bueman Senior High School (BUSEC) and Presbyterian Senior High School (PRESEC). All the above mentioned schools are within Jasikan Municipality of the Oti-Region one of the six (6) newly created regions in Ghana.

3.3 Sampling techniques/procedure

According to Dottalo (2008), sampling is a procedure used to choose components from a populace. Sampling is taking part of the population that the research can be conducted on. Sampling is done in a way that inferences can be generalized to the whole population. According to Leedy (1993) sampling is the process of choosing from a much larger population, a group about which a generalized statement is made, so that selected parts represents the total group.

Sampling itself is not a technique or method for getting data but what it does is ensuring that any of the techniques used would be the mouth- piece of the entire greater population. From the above it can be seen that the total number of teachers and students ideally to be used in the study is one fifty (50). The formula that was developed by Yamane 1973 for calculating sample size as cited in Adebi-Caesar (2012) was used. The formula is produced below.

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n = is the required sample size.

N = the population size

e = Tolerable error (which in this study was pegged at 0.05).

The sample size was thus calculated for the population is as follows:

Where the population size (N) = 50 participants

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{50}{1 + 50(0.05)^2}$$

= 44.44444

Approximately = 44

Therefore, the total sample size for the study is 44 participants.

Considering the fact that the total population was made up of the sum from two (2) different schools with different populations of teachers and students, there is therefore the need to sample from each school with respect to the real size of the teachers and students involved. The two (2) chosen respondents were grouped into two (2) different strata. Proportional allocation was used calculating the size that was supposed to be taken from each stratum. The formula that was used in calculating the sample to be taken from each stratum is presented below:

$nh = \frac{Nh}{N}$X n

Where, nh= sample size of stratum h (that is the sample size for each community)

n = sample size,

N =Total population Size.

For teacher respondents,

$nh = \frac{Nh}{N}$X n

$nh = \frac{25}{50}$X 44

= 22 respondents

For student respondents,

$nh = \frac{Nh}{N}$X n

$nh = \frac{25}{50}$X 44

= 22 respondents

From the above information the sample size for teachers in both schools should be 22 and that of students 22 but since it's a comparative study from two (2) different school, but the chosen population is same there is no need take from each school with respect to the real size of the school involved. Simple random sampling was then used in selecting the respondents from the various schools. Random sampling according to Thomas (2020) is a sample method where each member of the population has an exactly equal chance of being selected. This sampling technique was used because it affords all the members under consideration the equal chance of being selected

3.4 Sources of data

The main source of data used in this study was the primary data and the secondary source of data. Primary data or sources of data are data that have been collected from first-hand-experience. It is normally collected through the use of both open – ended and close – ended questions. Also, the secondary sources of data are the data that has already been collected by someone and have gone under the statistical process or analysis (Kothari, 2004).

3.5 Instrument for data collection

Social enquiry demands that data or information is taken from institutions and individuals on various disciplines. One has to also observe a phenomenon to be able to get firsthand information in that particular phenomenon (Kumekpor, 2002). Information can be obtained using various method of data collection like interview guides, observations, surveys, questionnaires and many more. Questionnaires are the instrument for data collection in this study. A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A

research questionnaire is typically a mix of close-ended questions and open-ended questions. Questionnaires were developed in English Language and administered in sections. Questionnaires were administered to Students in their various classrooms immediately after class's hours and teachers in various departments in different sections randomly. Secondary sources of information and data were sourced through an extensive search and review of literature.

3.6 Methods of data analysis

Descriptive statistics was used to analyze the data collected for easier interpretation of data collected. The study was employed descriptive statistics to summarize teachers and students perception of the use of ICT for teaching and learning in senior high schools in Ghana. Frequency tables, pie charts and bar chats were also used in presenting the data.

3.7 Ethical considerations

According to Bryman (2007) the respect and dignity of research participants should not be prioritized, protection of participants' privacy has to be ensured and anonymity of individuals and organizations participating in the research must also be ensured. As stated by Fraenkel (2000) and Wallan (2000) "all participants should be assured that any data collected from or about then should be held in confidence". All participants were informed that the information collected was to be used for academic purpose only and their assured confidentiality. Permission was sought from management of both schools in a form of an introduction letter from the Department of Information communication Technology Education at the University of Education Winneba, before administering questionnaires to respondents .The research was in-line with the code of ethics that the University of Education Winneba used in conducting their research.

CHAPTER 3

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents the data that was collected during the study. It also talks about the analysis of the data and its discussions. Respondent answered questionnaires based on;

- Challenges associated with the use of ICT for teaching and learning
- Perception on the use of ICT for teaching and learning
- Availability of ICT infrastructure

After questionnaires have been administered and data collected, the next step was to tabulate the responses and attribute scores to them after which the scores were described in a summarized form using one or more descriptive statistics (Fraenkel and Wallen, 2000).

The first section talks about the demographic characteristics and personal information of the respondents. The second session deliberates on the challenges related to the use of ICT for teaching and learning in senior high schools. The third session examines the perception of teachers and students of the use of ICT for teaching and learning. The final session will look at the assessment of the extent of availability of ICT tools or equipment in the school.

4.1 Demographic Characteristics and Background Information

Table 4.1 Background Information

Response	Students	Teachers	Frequency	Percentage (%)
Bueman SHS	12	10	22	50
Presbyterian	10	12	22	50

SHS				
Total	22	22	44	100

Source: Field Survey, 2021.

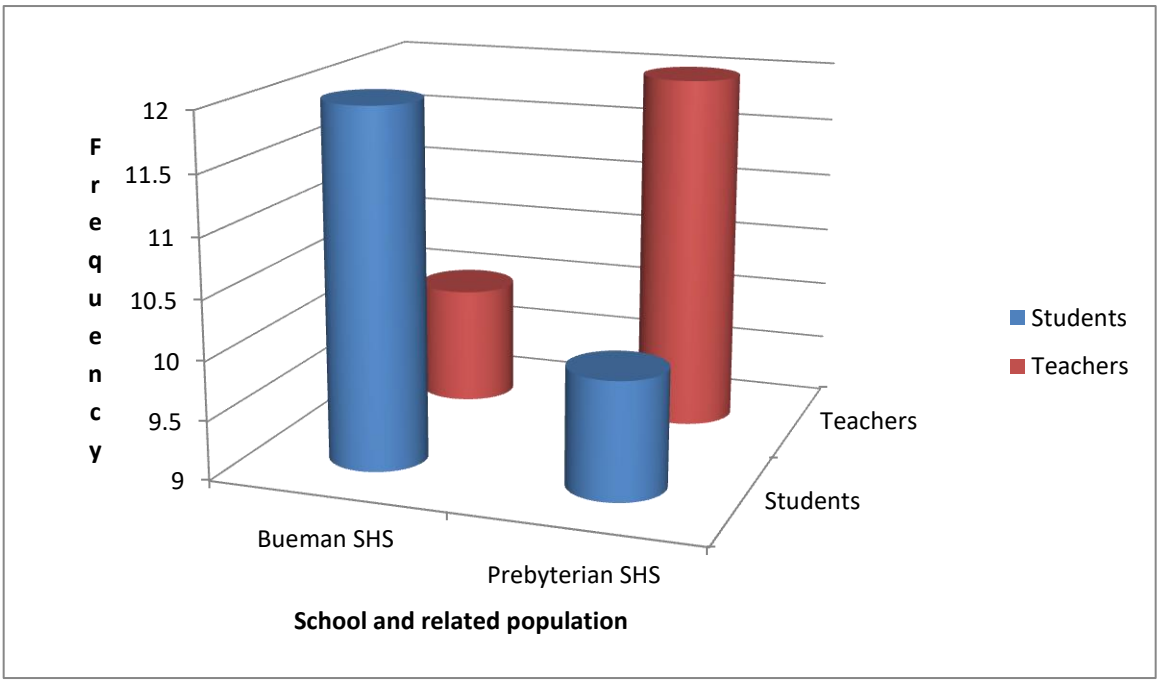

Figure 4.1 School and related Population.

From the above figure 4.1 it indicates that Bueman Senior high School With 12(27%) teachers and 10(23%) students is directly equal to the sample size of Presbyterian senior high school with 10(23%) teachers and 12(27%) students. From the above information, respondents response can be generalized because they have almost there same number of respondents from both school.

Table 4.2 Gender of Respondents

Response	Students	Teachers	Frequency	Percentage (%)

Male	12	12	24	54.54
Female	10	6	20	44.55
Total	24	20	44	100

Source: Field Survey, 2021.

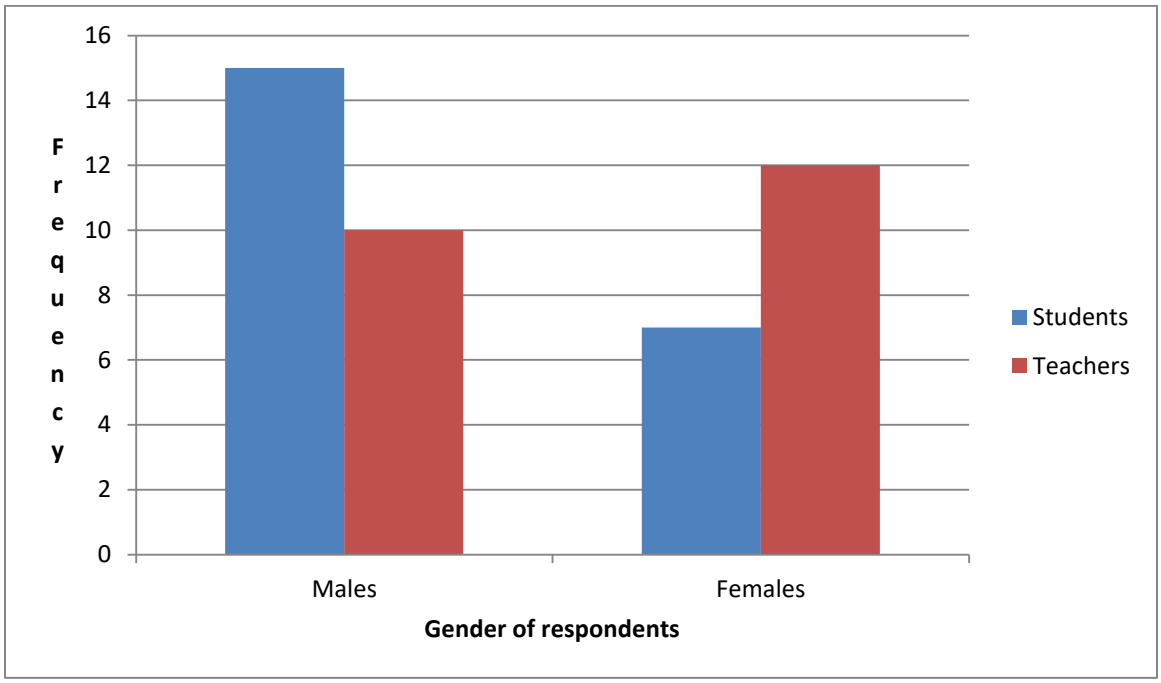

Figure 4.2 Gender of respondents

The table above shows the number of male participants to be 24(54.54%) and the number of female participants to be 20(44.55%). The above table shows a total of 44 respondents from both school including both teachers and students. This indicates that there were more male students than females. The respondents for Teachers also imply that there were more females' respondents as compared to males.

Table 4.3 Age Range of Teacher Respondents

Response	Frequency	Percentage (%)
Under 25	0	4.54
26-30	4	18.18
31-35	2	9.0
36-40	1	1.27
41-45	4	18.18
46-50	6	27.27
51-55	2	9.0
56-60	2	9.0
60-above	1	4.54
Total	22	100.0

Source: Field Survey, 2021.

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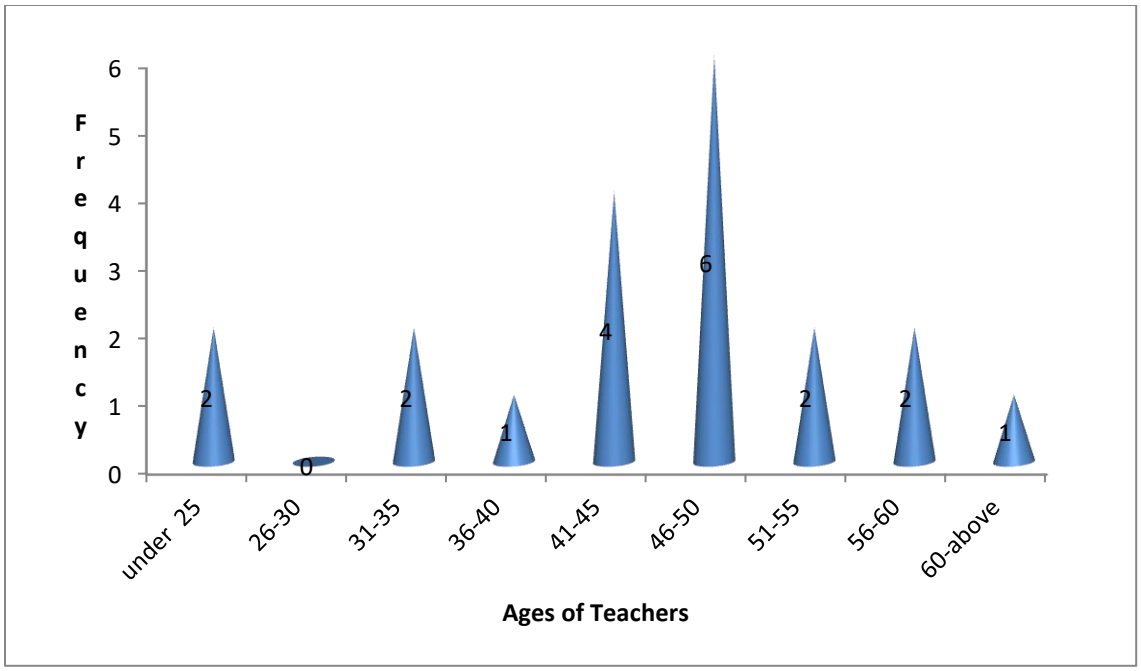

Figure 4.3 Ages of Respondents

Figure 4.3 is a description of the age distribution of teachers in both schools. In the Figure above, it is evident that majority of the respondents fell within the age range of ―46-50 years which is represented by 6(33.3%) out of 22. Teachers who fell within the ranges of 26-30 years and above were within the minority of respondents which is represented by 0(0%) out of 22 respondents. The remaining 14 (7.1%) fell in the other age bracket. This implies that majority of the teachers are almost at their golden age and any response they give will be out of experience.

Respondents' highest educational level that they have attained as a requirement of the questionnaires was tabulated below. Their response is presented in table 4.4

Table 4.4 Teachers highest educational level

Response	Presec, Jasikan	Busec, Jasikan	Frequency	Percent (%)
HND	3	4	7	35%

Diploma	-	-	-	0%
First Degree	5	4	9	45%
Second Degree	1	2	3	15%
PHD	1	-	1	5%
Total	10	10	20	100%

Source: Field Survey, 2021.

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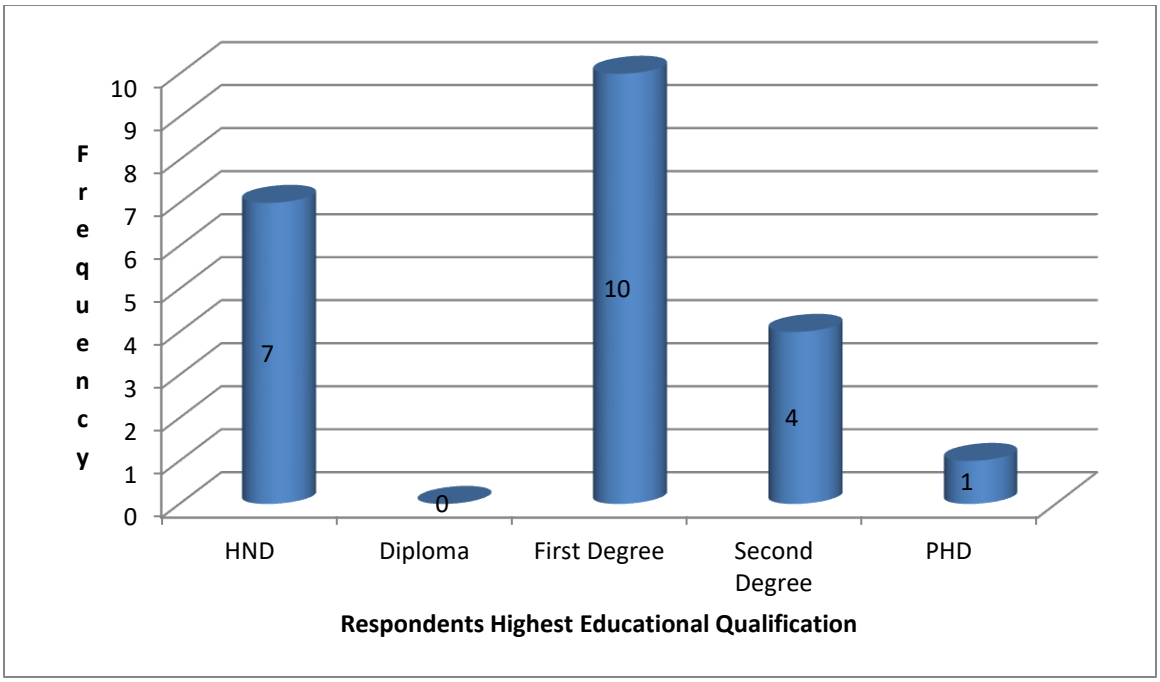


Figure 4.4 Respondents Highest Educational Level

From the overall population based on highest academic qualification, most of the respondents come with first degree qualification with 10 (45.45%), followed by HND with 7 (31.12%), then second Degree with 3 (18.18%) and respondents with PHD qualification with 1 (4.54%).

4.5 Student year of study

Table 4.5 Student year of study

Response	Frequency	Percentage (%)
Form ONE(1)	14	63.6
Form Two(2)	8	36.36
Total	22	100

Source: Field Survey, 2021.

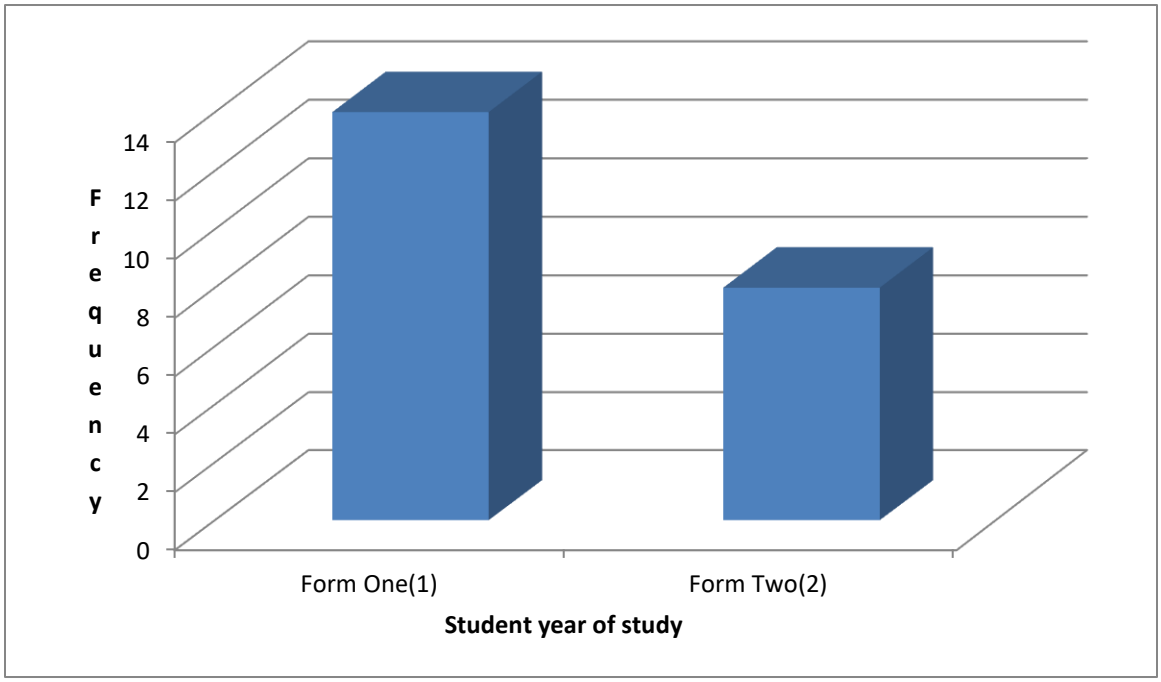


Figure 4.5 Students year of study

Form one respondents were 8(36.36%) and 14 respondents representing 63.6% were found to be in Form two. This meant that there was a slight difference in respondents from the various forms even

though the researcher's aim was to have an equal representation of the various forms using the stratified approach of instrumentation. It is an indication that, with a higher number of respondents from the second year they will be able to know much about the schools resources and how technology have been used in delivering lessons to them.

4.6 Teachers preferred teaching style

Respondents' preferred teaching style as a requirement of the questionnaires was tabulated below.

Table 4.6 Teachers preferred teaching style.

Factor	Frequency	Percentage (%)
Conventional/Traditional	7	25
Modern/Contemporary	14	75

Source: Author's construct, 2021.

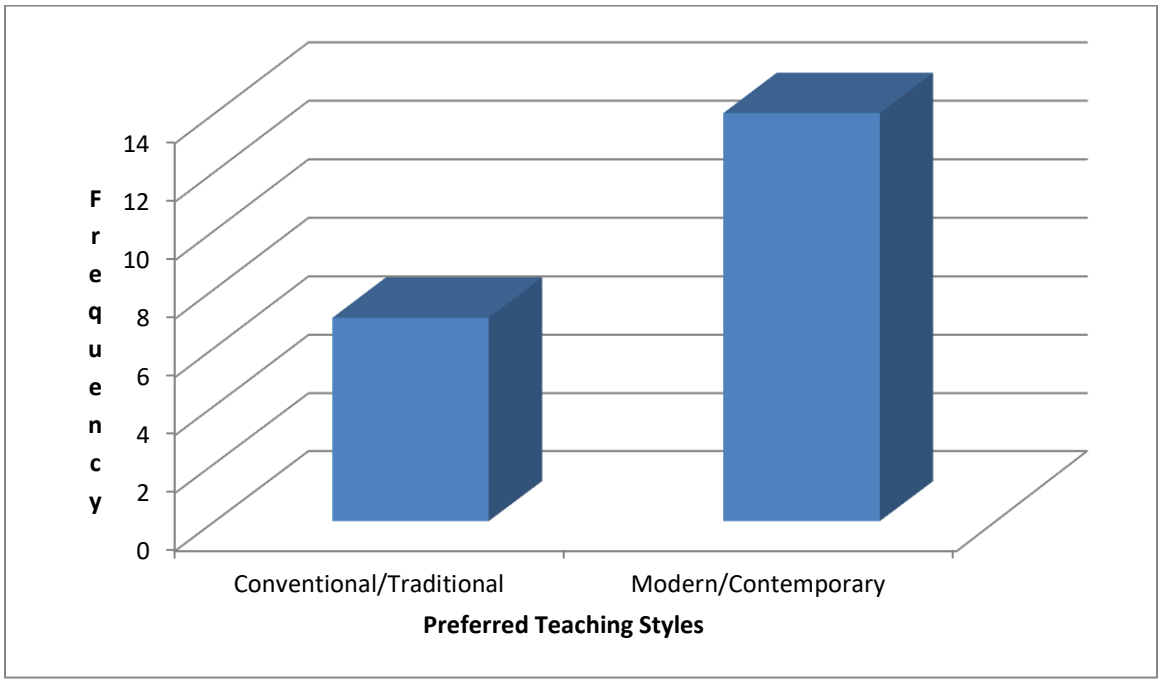


Figure 4.6 Preferred Teaching Styles

From the overall teachers population based on preference of teaching style, more respondents preferred modern/contemporary teaching style with 14 (75%) as compared to respondents who preferred conventional/traditional method of teaching with 7(25%). It is an indication that majority of teachers will use ICT in their teaching and learning since they have positive perception on ICT integration.

4.7 Course of students

Responses from respondents about the courses offered indicate that, all the courses in the school have at least one person representing the class as a whole. In the bid to have equal representation of all courses offered in both schools, randomization was done in way that all various programs were represented. The representation is shown below.

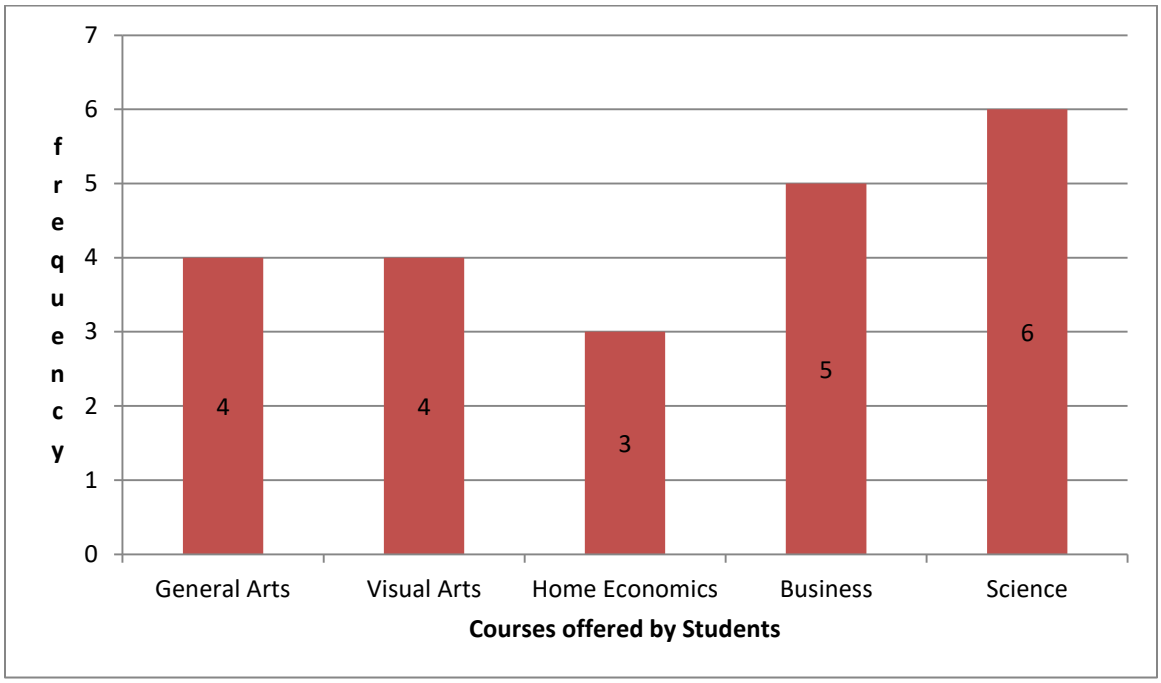


Figure 4.7 courses offered by students

Teacher respondents were asked the number of years they have been in the profession. Their response is presented in figure 4.8

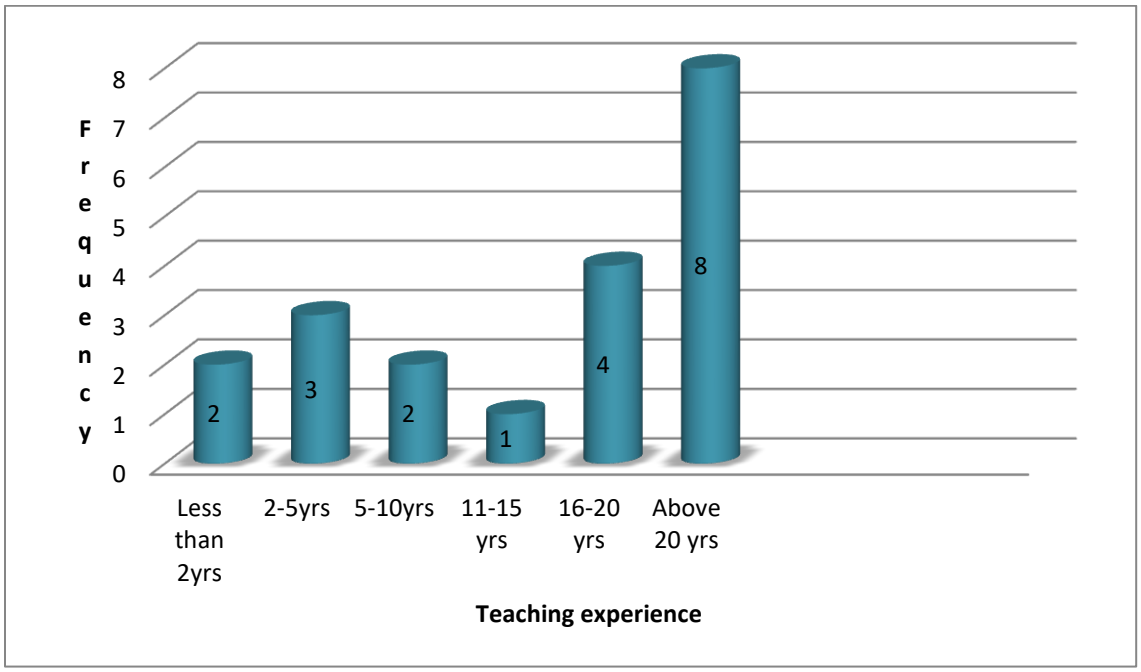


Figure: 4.8 Number of years spent in the teaching profession

From the above graph it is clear that the higher number of teachers respondents were very experienced in the teaching field having thought for more than 20 years with 8(40%) with those between 11-15 years being the least with 1(5%) of the total teacher respondent. From the above graph is clear that we can do generalization because all year range had teachers in that range. Respondents that have been in the system for just a short while will answer the questionnaires based on theirs experiences whiles on campus and how ICT was been used in teaching and learning as compared to their new teaching situation. Other who had the opportunity to be teachers for a long period of time will also use these opportunity to share their experiences on how they have been able to integrate the use of ICT I their teaching and learning process.

4.9 Challenges Associated With the Use of ICT for Teaching and Learning

As indicated in my first objective of the study, the researcher sought to find out the challenges that students and teachers of Bueman SHS and Presbyterian SHS, Jasikan faced in the use ICT for teaching and learning.

Table 4.9.1: Frequencies and Percentages of the Challenges for Teaching and Learning ICT from Teachers

Variable	Frequency		Percentage (%)	
	Bueman SHS	Presbyterian SHS	Bueman SHS	Presbyterian SHS
Limited access to ICT hardware and software	7	6	70%	60%
Weak government policies	4	2	40%	20%
Poor ICT infrastructure	10	10	100%	100%
Lack of competent ICT staff	4	7	40%	70%
Poor institutions coordination and curriculum variation/dynamics	5	5	50%	50%
High costs imposed on ICT tools	8	7	80%	70%
Little government funding	8	9	80%	90%
Reluctance to use ICT tools in teaching and learning ICT	1	3	10%	30%
Lack of practical training	6	8	60%	80%
Limited time allocation to	8	9	80%	90%

ICT courses

Source: Field Survey, 2021.

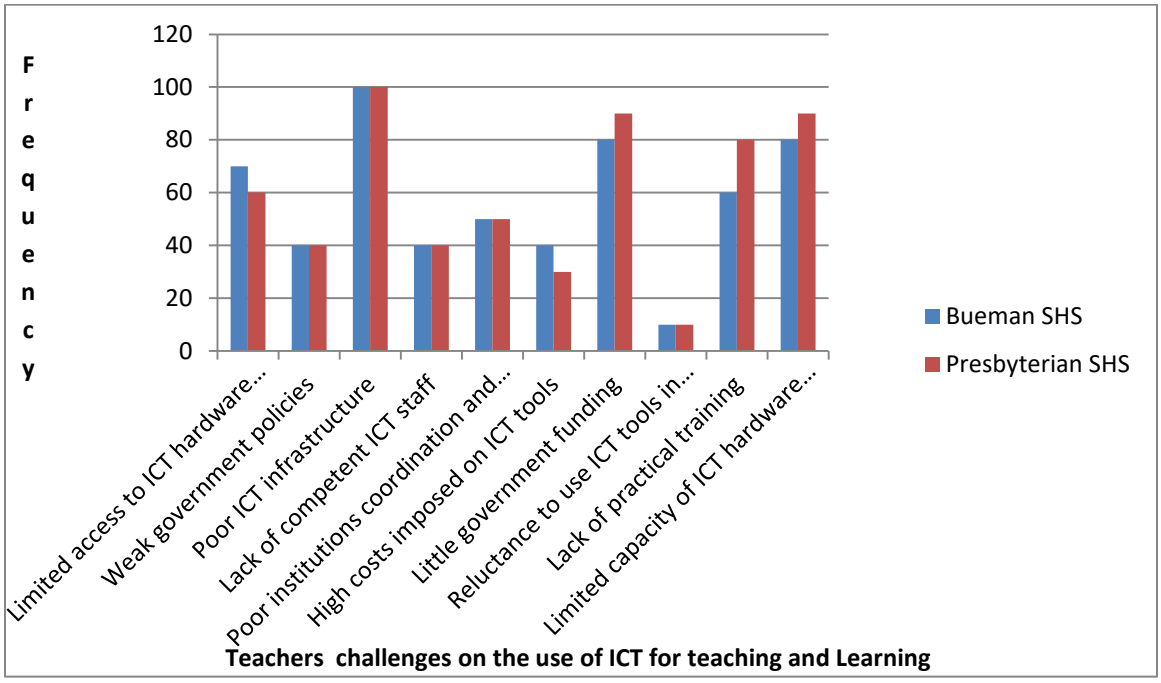


Figure 4.9.1 Teachers Challenges of the use of ICT for teaching and learning.

The results (Table 4.9.1 and Figure 4.9.1) indicate that Limited access to ICT hardware and software 7(70.0%) out of 10(100%) from Bueman SHS and 6(60.0%) out of 10(100%) for Presbyterian SHS, which means that all these two schools are lacking Facilities. Teachers disagree with the fact that weak government policies is one of challenges they faced with ICT integration in Schools as 4(40.0%) out of 10(100%) from Bueman SHS and 2(20.0%) out of 10(100%) for Presbyterian SHS shared their high level of disagreement. There is no doubt at all that all the above mentioned schools have the resources for teaching and learning where respondents have indicated that 10(100.0%) out of 10(100%) from Bueman SHS and 10(100%) out of 10(100%) for Presbyterian SHS shared their high level of disagreement. Indications from respondents shows that Lack of competent ICT staff is less a problem at

the Presbyterian SHS with 7(70.0%) out of 10(100%) and from Bueman SHS and 4(40.0%) out of 10(100%) which indicates low level of competent ICT staff. Poor institutions coordination and curriculum variation/dynamics is one notion each school thinks it deserves to be looked at again with both schools representing 5(50.0%) out of 10(100%). High costs imposed on ICT tools is well agreed upon as one challenges of individuals as high cost may prevent individuals to getting their personal facilities it was proven with 8(80.0%) out of 10(100%) from Bueman SHS and 7(70%) out of 10(100%) for Presbyterian SHS. Little government funding responses were 8(80.0%) out of 10(100%) from Bueman SHS and 7(70%) out of 10(100%) for Presbyterian SHS. Reluctance to use ICT tools in teaching and learning is one thing almost all the teachers disagree on because not facilities are even available to be used with 1(10.0%) out of 10(100%) from Bueman SHS and 3(30%) out of 10(100%) for Presbyterian SHS. Yes if Teachers are not taken through how they will go about the ICT there will be Lack of practical training and teachers will not be able to perform respondents were in agreement with 6(60.0%) out of 10(100%) from Bueman SHS and 8(80%) out of 10(100%) for Presbyterian SHS. Limited time allocation to ICT courses is one of the reasons one may not be able to integrate ICT in teaching and learning as shown in figure 4.9.1 respondents responses were 8(80.0%) out of 10(100%) from Bueman SHS and 7(70%) out of 10(100%) for Presbyterian SHS which means the Teachers belief that time allocated to various courses are limited and they will need more time to be able to use ICT in their teaching and learning process.

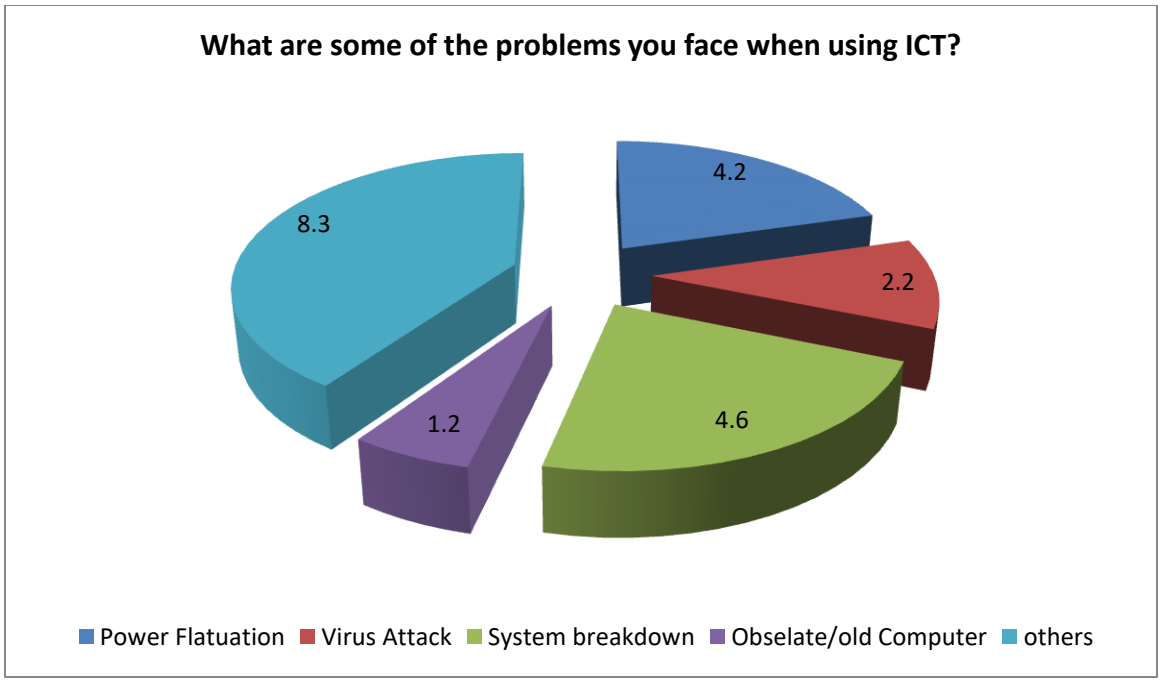


Figure 4.1.4 Challenges for Teaching and Learning ICT from Student

In the other section a huge number of the students of the school wrote lack and insufficient computers as one of the main challenges they face in integrating ICT in learning forming 10(80%) of the total student respondents. "System breakdown" and “Power fluctuations” were also mentioned as one of the biggest challenges facing both schools in using ICT in their teaching and learning situations. In both Bueman Senior High School and Presbyterian Senior High School, Jasikan, it is represented by 6(42%) out of 12 students and 7(46%) out of 12 students. which was represented in the pie chat above teachers affirmed the assertion that their major challenge with the use of ICT for teaching and learning was system breakdown and power fluctuations. Student respondents of both schools also indicated that virus attack and obsolete computers with 3(22%) and 2(12%) out of 12 students were the least challenge with the use of ICT for teaching and learning. The researcher therefore concluded that lack of a computer lab

or computers especially in the rural areas in one challenge that if addressed can help and improve the use of ICT for teaching and learning in schools.

4.3 Teachers' Perception on Use of ICT for Teaching and Learning.

From the data provided in Table 4.3.1 below is a reorientation of the second objective of this study in accordance to respondents' responses about teacher's perception of ICT in teaching which indicates that most teachers are aware of the importance of ICT in teaching.

Table 4.3.1 Teachers' Perception on Use of ICT for Teaching and Learning in Bueman Senior High School.

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	TOTAL
		Frequency and percentage				
1.	Using ICT to teach is time consuming.	9 (90.0%)	1 (10.0%)	0 (0.0%)	0	(100%)
2.	Internet use can improve your teaching skills.	0 (0.0%)	2 (20.0%)	1 (10.0%)	7 (70.0%)	(100%)
3.	ICT should be integrated into learning.	0	0 (0.0%)	0 (0.0%)	10 (100.0%)	(100%)
4.	All my teachers are very competent in using ICT for teaching	5 (50.0%)	2 (20.0%)	3 (30.0%)	0 (0.0%)	(100%)
5.	I prefer using the internet to prepare my lessons than to use the library	4 (40.0%)	2 (20.0%)	4 (40.0%)	0 (0.0%)	(100%)
6.	ICT tends to increase students 'learning motivation	1 (0.0%)	0 (0.0%)	5 (50.0%)	5 (50.0%)	(100%)
7.	ICT can enhance students' language and writing skills (e.g. grammar, spelling, punctuation, etc)	1 (10.0%)	0 (0.0%)	8 (40.0%)	1 (10.0%)	(100%)

8.	ICT can enhance collaboration among students and teachers	0	3 (30.0%)	5 (50.0%)	2 (20.0%)	(100%)
9.	Students' pay less attention when ICT is used in teaching.	1 (5.0%)	2 (10.0%)	3 (15.0%)	14 (70.0%)	(100%)
10.	Students' makes no effort for their lesson if ICT is used in teaching.	1 (10.0%)	4 (40.0%)	4 (40.0%)	1 (10.0%)	(100%)
12.	I think the use of ICT helps to prepare teaching resources and materials.	0 (0.0%)	0 (0.0%)	4 (40.0%)	6 (60.0%)	(100%)

Source: Field Survey, 2021.

Table 4.3.2 Teachers' Perception on Use of ICT for Teaching and Learning in Presbyterian Senior High School.

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	TOTAL
		Frequency and percentage				
1.	Using ICT to teach is time consuming.	1 (8.33%)	3 (25.0.0%)	1 (8.33%)	7 (58.33.0%)	(100%)
2.	Internet use can improve your teaching skills.	0	0 (0.0%)	0 (0.0%)	12 (100.0%)	(100%)
3.	ICT should be integrated into teaching.	0	2 (10.0%)	10 (40.0%)	2 (50.0%)	(100%)
4.	All my teachers are very competent in using ICT for teaching	0 (0.0%)	0 (0.0%)	7 (58.3%)	5 (41.6%)	(100%)
5.	I prefer using the internet to prepare my lessons than to use the library	6 (50.0%)	4 (33.33%)	1 (8.33%)	1 (8.33%)	(100%)
6.	ICT tends to increase students 'learning motivation	1 (8.33%)	3 (25.0%)	3 (25.0%)	5 (41.6%)	(100%)
7.	ICT can enhance students' language and writing skills (e.g. grammar, spelling, punctuation, etc)	1 (8.33%)	3 (25.0%)	3 (25.0%)	4 (33.33%)	(100%)
8.	ICT can enhance collaboration among students and teachers	0	0 (0.0%)	0 (0.0%)	12 (100.0%)	(100%)

9.	Students' pay less attention when ICT is used in teaching.	4 (33.3%)	2 (16.66%)	3 (25.0%)	1 (8.3%)	(100%)
10.	Students' makes no effort for their lesson if ICT is used in teaching.	10 (83.33%)	0 (0.0%)	2 (16.66%)	0 (83.33%)	(100%)
12.	I think the use of ICT helps to prepare teaching resources and materials.	0	1 (8.33%)	6 (50.0%)	5 (41.6%)	(100%)

Source: Field Survey, 2021.

Table 4.3.1 and Table 4.3.2 is a representation of Teachers' Perception on Use of ICT for Teaching and Learning in Bueman senior high school and Presbyterian Senior High School.

It can be seen from table 4.3.1 and table 4.3.2 that 128 (12.4%) responses from both Bueman SHS and Presbyterian SHS each respectively went against the notion using computers in your teaching and learning is time consuming which may change the perception of teachers from using or introducing the use of ICTs in their teaching and learning. The second response also went in favor of the fact that the use of the internet can improve the teaching skills of teachers with 9(75%) strongly agreeing 2(16.6%) agree and 1(8.3) disagreeing from Presbyterian SHS and all 10(100.0%) strongly agreeing for Bueman SHS. Teacher respondent response to the question all my teachers are very competent in using ICT for teaching in much of almost all the teachers in both school are competent in using ICT for teaching and learning with 7(58.3) Strongly Agreed, 2(25%) and 1(8.3%) Agreed with no teacher disagreeing from Presbyterian SHS and 5(41.6%) and 7(58.3%) from Bueman SHS, Jasikan. This is an indication that when the necessary infrastructure is made available students will be able to benefits considering the fact that teachers are competent in using ICT in teaching. It was clear that a larger population of teachers from both schools strongly disagree with the they prefer using the internet to prepare their lessons than to use the library with Presbyterian SHS 6() Strongly Disagree, 4(33.3%) Disagree, 1(8.33%) Agree and 1(8.33%) Strongly Agree and Bueman SHS with 7(70.0%) Agree, 2(20%) and 3(30%) Strongly Disagree. Teachers at Bueman senior high school strongly disagreed with the question students make

no effort for their lesson if ICT is used in teaching with Presbyterian SHS 10(83.33%) Strongly Disagree, 2(16.66%) with Bueman SHS also with 1(10%) Strongly Disagreed, 4(40%) Disagreed, 4(40%) Agreed and 1(10%) Strongly Agreed. It is an indication some of the teachers think no effort is been made by students in their lessons and other number also belief it is a false statement.

A deduction made from the above is that the students and teachers can do well with the use of ICT especially in the case where there is a sufficient resource. It was also deduced from the above that, teachers do not think using ICT to teach is Time consuming but it is an opportunity for them to use ICT to motivate the students and in other ways will help reduce the work load on teachers.

Table 4.3.4 Perception of Students (Bueman Senior High School).

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	TOTAL
		Frequency and percentage				
1.	Internet use can improve your learning	0	0 (0.0%)	3 (30.0%)	7 (70.0%)	(100%)
2.	ICT should be integrated into teaching	0 (0.0%)	1 (10.0%)	3 (30.0%)	6 (60.0%)	(100%)
3.	Using ICT to learn is time consuming	6 (60.0%)	3 (30.0%)	1 (10.0%)	0 (0.0%)	(100%)
4.	All my teachers are very competent in using ICT for teaching	1 (10.0%)	2 (20.0%)	3 (30.0%)	4 (40.0%)	(100%)

5.	I prefer using the internet to learn than to use the library	0 (0.0%)	0 (0.0%)	3 (30.0%)	7 (70.0%)	(100%)
6.	ICT tends to increase students 'learning motivation	1 (5.0%)	3 (15.0%)	6 (30.0%)	(50.0%)	(100%)
7.	Students are afraid using the computer because they may get damage.	1 (10.0%)	(10.0%)	3 (30.0%)	5 (50.0%)	(100%)
8.	ICT can enhance collaboration among students and teachers	0	0 (0.0%)	4 (40.0%)	6 (60.0%)	(100%)
9.	ICT tends to reduce to work load on teachers in explaining tedious concepts.	1 (10.0%)	2 (20.0%)	3 (30.0%)	4 (40.0%)	(100%)
10.	Using ICT to learn improves students understanding on various concepts.	1 (10.0%)	2 (20.0%)	2 (20.0%)	5 (50.0%)	(100%)

Source: Field Survey, 2021.

Table 4.3.5 Perception of Students (Presbyterian Senior High School).

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	TOTAL
		Frequency and percentage				
1.	Internet use can improve your learning	0 (0.0%)	2 (16.6%)	4 (33.3%)	6 (50.0%)	(100%)
2.	ICT should be integrated into teaching	0	1 (8.3%)	4 (33.3%)	7 (58.3%)	(100%)
3.	Using ICT to learn is time consuming	10 (83.3%)	2 (16.6%)	0 (0.0%)	0 (0.0%)	(100%)
4.	All my teachers are very competent in using ICT for teaching	1 (8.3%)	2 (16.6%)	3 (15.0%)	15 (75.0%)	(100%)
5.	I prefer using the internet to learn than to use the library	0 (8.3%)	2 (16.6%)	2 (16.6%)	8 (66.6%)	(100%)
6.	ICT tends to increase students 'learning motivation	1 (10.0%)	2 (20.0%)	1 (10.0%)	6 (60.0%)	(100%)
7.	Students are afraid using the computer because they may	6 (50.0%)	4 (33.3%)	1 (8.3%)	1 (8.3%)	(100%)

	get damage.					
8.	ICT can enhance collaboration among students and teachers	2 (16.6)	1 (8.3%)	2 (16.6%)	7 (58.3%)	(100%)
9.	ICT tends to reduce to work load on teachers in explaining tedious concepts.	0 (0.0%)	3 (16.6%)	5 (41.6%)	4 (33.3%)	(100%)
10.	Using ICT to learn improves students understanding on various concepts.	1 (8.39%)	1 (8.3%)	6 (50.0%)	4 (33.0%)	(100%)

Source: Field Survey, 2021.

From Tables 4.3.4 and 4.3.5, it was discovered that the internet could improve their learning, 7(75%) students of Bueman SHS "Strongly agreed", 1(10%) "Agreed", and 2(15%) "Disagreed" to this assertion. With Presbyterian SHS, Jasikan, 6(60%) "Strongly agreed", 2(20%) "Agreed" and 2(20%) "Disagreed" to the notion that internet use could improve learning. The conclusion that can be drown out is that majority of the students in both schools strongly agree that the use of the internet can improve their learning.

From the responses it was discovered that a greater number of students from both Bueman SHS and Presbyterian SHS, "Disagreed" that using ICT to learn was time consuming and this was evident in their response rates of 7(70%) out of 10 respondents and 9(69.9%) out of 12 respondents. This is an indication that students in both schools —disagreed that using ICT to learn was time consuming.

For Bueman SHS, 6(60%) out of 10 students and 8(66.6%) out 12 Presbyterian SHS, Jasikan students "Strongly agreed" that ICT should be integrated into learning. From Table 4.2.3 and 4.2.4, there is a clear indication that almost all the students in both schools either "Strongly agreed" or "Agreed" to the integration of ICT into learning. On the competence of teachers in both schools, students "Agreed" that their teachers were very competent in using ICT for teaching. This is represented by 6(60%) out 10 respondents for Bueman SHS students and 9(75%) out of 12

respondents for Presbyterian SHS, Jasikan students. Again for Bueman SHS, 6(60%) out of 10 students and 7(58.3%) Presbyterian SHS, Jasikan students "Strongly agreed" that they preferred using the internet to do their assignment rather than use the library for information.

In connection with students' learning motivation, 6(60%) of Bueman SHS students "Strongly agreed" that the use of ICT increases their learning motivation while 7(67.3%) students from Presbyterian SHS, Jasikan "Strongly agreed" that the use of ICT increases their learning motivation. It can therefore be deduced that ICT as a matter of fact can increase students' motivation and encourage them to learn more.

Assertions from both schools were contrasting as Bueman SHS out of 10 students had 5(50%) who strongly agreed and out of 12 students had 6(50%) who strongly disagreed that Students are afraid using the computer because they may get damage. Here it is evident students from Bueman SHS think students are afraid to use the computer lab which may be as a result of the large number of damage computers leaving a few working ones. Presbyterian SHS on the other side also thinks even without a lab they think students are confident enough to be able to use the lab if given a chance to operate.

A greater number of students from both schools "Strongly agreed" that ICT can enhance collaboration among students and teachers. From Table 4.3.4, it can be seen that, 6(60%) out of 10 Bueman SHS students "Strongly agreed" to the assertion, 4(40%) "Agreed", and 1(10%) "Disagreed". None of the student in Bueman SHS "Strongly disagreed". With regards to Presbyterian SHS, Jasikan students, 6(50%) out of 12 respondents "Strongly agreed"' and 3(30%) "Agreed". None of the students from Presbyterian SHS, Jasikan "Disagreed" or "Strongly Disagreed". From the above analysis, it can be concluded that

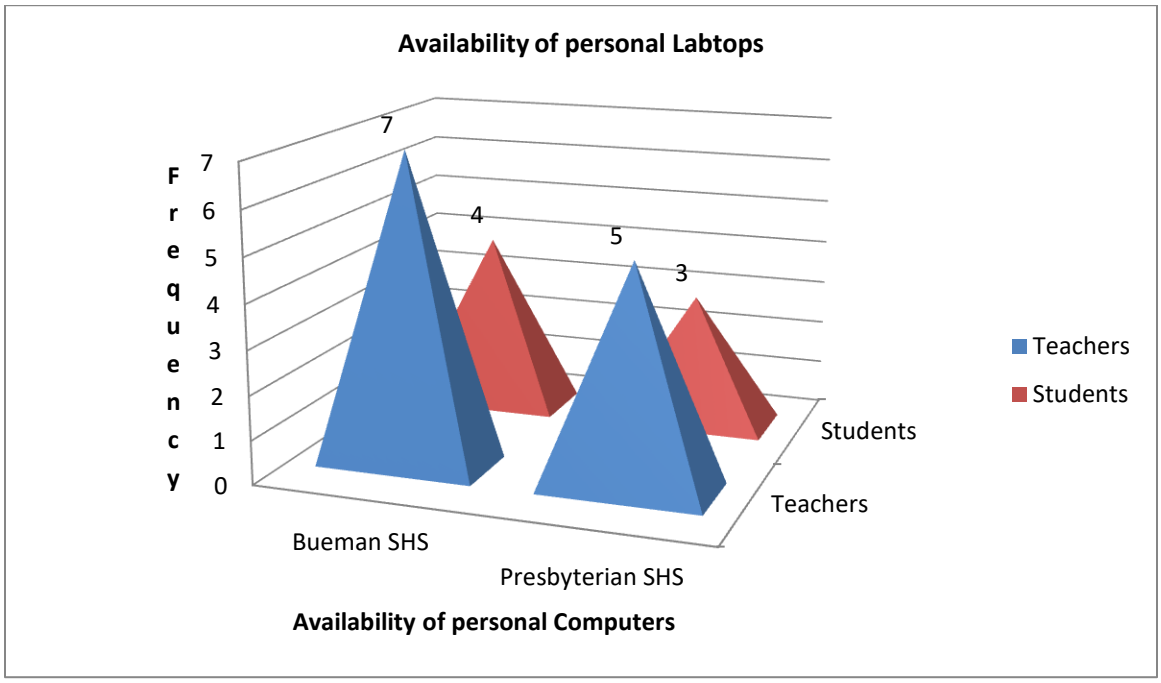
majority of students in both schools agreed that ICT can enhance collaboration among students and teachers. With the use of ICT for teaching and learning students are able to understand various difficult concepts thought in class in a simpler manner. The response indicates that most students either "Strongly agreed" or "Agreed" to the assertion that ICT can improves learners understanding of difficult concepts. From the Table 4.3.4, students from Bueman SHS gave the following responses; 5(50%) "Strongly agreed", 4(40%) "Agreed", and 1(10%) "Disagreed". For Presbyterian Senior High School, Jasikan, 4(40%) "Strongly agreed", 6(50%) "Agreed", and 1(10%) "Disagreed". From the responses represented by the figures in Tables 4.3.4 and 4.3.5, it is evident that teachers and students perception about the use of ICT for teaching and learning is positive.

4.4 Availability of ICT infrastructure

The second objective of the study sought to inquire whether ICT facilities were at the disposal of students and teachers of both schools under the study. Under this section, the researcher also sought to find out if there were computer laboratories, internet connectivity, enough computers, the purpose of the Lab if there is any, Frequent maintenance and how often students get access to the lab.

4.4.1 Availability of personal computers

Figure 4.3.1 Availability of personal computers



From the above Figure 4.3.1 it is clearly representing the response from respondents of both schools on their possession of personal computers. Bueman SHS with 7(58.3%) teachers and 4(41.67%) students. From their response it indicates that most of the teachers have their

personal computers that can aid in their teaching and learning process with a number of students with their personal computers it makes teaching more learner centered and understanding. Presbyterian SHS on the other hand has 5(41.67%) out of 10 teachers and 3(25%) out of 12 students. Since there are few teachers and students with a personal computer it could be that students are not having any prerequisite skills that that support the teacher in his lesson delivery. It is also assumed that many of the teachers may not be abler to use computers since they do not have computers on their own and this is an indication that teachers and students of Bueman senior high may turn to use technology in their lesson delivery and learning than those at Presbyterian SHS. The table below is a description on whether or not the school has a computer lab.

4.4.1 Computer laboratory

Table 4.3.1 Availability of computer laboratory

Availability of computer laboratory	**Teachers**		**Students**	
	Presbyterian SHS	Bueman SHS	Presbyterian SHS	Bueman SHS
YES	0(0%)	10(89.5%)	2(10.5%)	10(100%)
NO	10(100%)	2(10.5%)	10(89.5%)	0(0%)
TOTAL	10(100%)	12(100%)	12(100%)	10(100%)

Source: Field Survey, 2021.

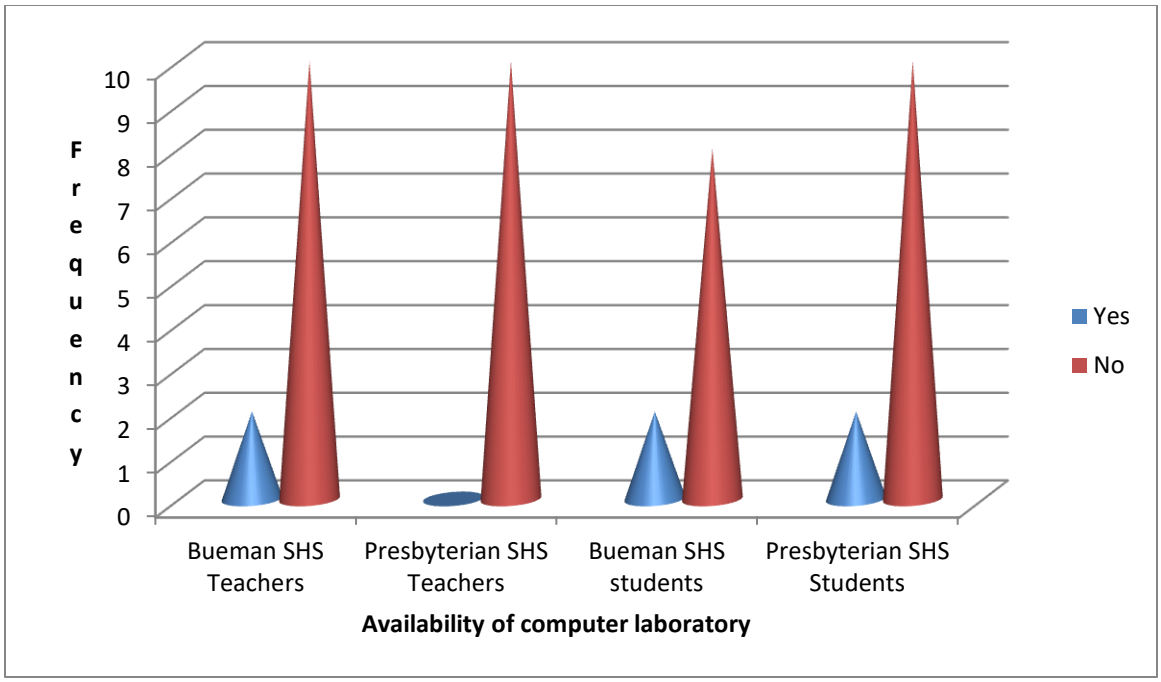


Figure 4.3.1 Availability of computer laboratory

In the study the researcher sought to find out or enquire from respondents of both school whether or not they have a personal computer lab since one can only use a tool in teaching or learning when it's at their disposal. From the respondents of both schools, as indicated in Table 4.3.1 Bueman senior high school 10(89.5%) of the teachers and 12(100%) of the students responded "Yes" which was an indication that the majority have agreed to the fact that the school has a lab but that of Presbyterian senior high school was a directly opposite response to that of Bueman SHS from its respondents with 10(100%) of teachers and 10(80%) of the students indicating "No" which form's the majority indicating they are without a lab in the school. From the above information it can be assumed that, the integration of ICT in these two Schools will take very difficult measures or approaches to achieve especially in the case of Presbyterian senior high school with no lab. Since Presbyterian SHS is without a lab all the other questions under Availability is not Applicable to its respondent.

4.4.2 INTERNET SERVICES

Table 4.4.2.1 Availability of internet connectivity

Availability of internet connectivity	Teachers		Students	
	Presbyterian SHS	Bueman SHS	Presbyterian SHS	Bueman SHS
YES	0(0%)	6(50%)	2(10.5%)	5(41.6%)
NO	10(100%)	2(10.5%)	12(100%)	0(0%)
TOTAL	10(100%)	12(100%)	12(100%)	10(100%)

Source: Field Survey, 2021.

When respondents of both schools were asked if the computers in the laboratory were connected to the internet, 6(50%) of the teachers from Bueman SHS responded positively, while 5(41.6%) of the students also affirmed the availability of internet connected to the computers. At Presbyterian SHS, also, 10(95%) of the teacher respondents confirmed there is no availability of internet connectivity and this was supported by 12(100%) students since it was not applicable to them since Presbyterian SHS has no computer lab.

4.4.3 AVAILABILITY OF SUFFICIENT COMPUTERS

Table 4.4.3.1 Availability of sufficient Computers

Availability of sufficient Computers	Teachers		Students	
	Presbyterian SHS	Bueman SHS	Presbyterian SHS	Bueman SHS
NO	0(0%)	2(10.5%)	2(10.5%)	1(10%)
YES	10(100%)	10(89.5%)	10(89.5%)	9(90%)
TOTAL	10(100%)	12(100%)	12(100%)	10(100%)

Source: Field Survey, 2021.

It can be seen from table 4.4.3.1 above that as many as 10 (89.5%) and 9(90%) students from both schools and 10(100%) of the respondents responded in the negative whiles the remaining 3 (2.1%) responded in the positive. From the above, it is evidently clear that all the schools used in the study do not have enough computers for studies. In the researcher's interaction with the ICT tutor of the Presbyterian SHS he said with a population of over 300 students they have only two computers in the school for administration use. It was not different from Bueman senior high school where the Head of department complained they have a computer lab with only 7 working computers with the others broken down since the government has refuse to bring down funds for maintenance. Per my observation in these two schools I can vividly say most of the computers in the various schools laboratories were really old and many other broken down. It was also observed that some of the computers had also broken down.

CHAPTER 5
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is made up the summary of findings of the study, the conclusions that were drawn and the recommendation thereof.

5.2 Summary of findings

This section is a representation of the totality outcome, notion revealed or indicated in the analysis of results. The summary of the finding of the research was organized under the objectives of the research.

5.2.1 Challenges related with the use of ICT for teaching and learning.

A challenge as the literature revealed is anything that retards the progress or achievement of any set objective or aim. It therefore means that, eliminating one or more of these barriers in the use of ICT for teaching and learning will contribute positively to advance the process of integration in the second cycle institutions in Ghana. In the course of putting in their best as teachers and students in using ICT in their learning situation they come across a lot of challenges that hinder their progress.

The finding of this study on limited access of ICT hardware and software is of no difference from Aguele (2007) and Rumanyika (2015) whose findings revealed effective teaching and learning with the use of ICT is not effective in Tanzania and Nigeria due to constraints such as insufficient fund to implement ICT effectively, inadequate technical experts to handle ICT activities, little procurement of sufficient bandwidth for internet connectivity and inadequate

software for teaching and learning. The above was proven to be same in the case of Ghanaian Senior high schools especially in the deprived communities or Grade “C” or “D” schools.

The findings regarding lack of ICT practical training are in harmony with other finding of other studies conducted in other developing countries like Libya; these findings suggest that teaching and learning ICT is confronted with lack of ICT practical training which exposes students to learn by doing. Teachers who are well trained to teach using technology have an upper hand over the course and are able to make use of available equipment’s in their teaching. From the responses gathered showed a majority of the teachers’ lack the necessary practical training required for the integration and with that the availability of the required infrastructure would not contribute to students’ high academic performance and integration since the teachers lack the necessary practical training.

5.2.2 Perception of teachers and students on the use of ICT for teaching and learning

The finding of the study indicated that teachers have positive perception towards the use of ICT for teaching and learning in Senior High Schools in Ghana. The teachers confirmed that the use of ICT for teaching and learning was not time consuming as others may think but rather a means to reduce their workload and increase the pace of lesson preparations. Every instructor or facilitator has a reason for integrating ICT in his/her lessons, the participants of this study stated clearly that, their reason for integration is to Increase students learning motivation, increase language and writing skills of their students and enhance collaboration among their students and themselves. As stated in the literature review Davis (1989) predicted two things that will let someone use a technological piece. The first have to do with “perceived usefulness” and the

other “perceived ease of use”. Perceive usefulness is how well the potential user beliefs the technological piece will enhance his/her daily activities and perceived ease of use also have to do with how much effort will be required by the potential user to use such an tool. With this study since the teachers understand the positive impact of Integration of ICT they were able to state that using it will improve their work as teachers. Taking about the ease of use Teachers indicated most of their fellow colleagues are not good enough with using ICT for teaching which makes the second prediction of Davis (1989) a barrier to ICT integration in schools. A majority of the respondents disagreed to the fact that students pay less attention in class when ICT is been integrated in teaching rather students are more focused on what is been thought when Technology is been integrated. It has always been the nature of students to explore technological tools and equipment or have the opportunity to see how such tools can be used in delivering lesson. Teacher that integrates ICT in his teaching session will get the best of students’ attention during lesson presentation. Most Teachers imply the use of technological based teaching as compared to the traditional method has a greater advantage thus save time from writing on the board and taking about good materials for teaching, the instructor will be able to get all the materials for that particular discipline in anywhere around the globe to aid understanding of difficult concepts. The above was made concrete when Teachers postulated the use of the internet is a means to improve their teaching skills with all the necessary tutorials, articles and books online about various difficult concepts and how one can go about delivering it.

Students on the other hand also have positive perceptions about the use of ICT for teaching and learning in schools. Students have no different perspective about integration of ICT but almost as what the teachers already stated. Students stated that a majority of their teachers are capable of using ICT in teaching them and they move on to agree to the fact that once they are thought

using ICT it will increase the motivation level of students in learning, increase collaboration between teacher and students and improving the understanding level of learners. The students also belief ICT integration is an opportunity for teachers to use it as a means to reduce their workload in the number of writing they do every day and researching from books to get best information before teaching. They also believe it is a means to take away the time consuming traditional mode of learning.

5.2.3 Availability of ICT facilities

As the topic of the study indicated the "the use of ICT for teaching and learning" if there are no ICT tools or technology there will be no use. One can only be able to make use of resources that are their disposal. Teachers who are the implementation body of the curriculum who can use ICT in their teaching and learning process need some infrastructure or equipment in the school to be able to implement such notion . In other related studies, responses from teachers in general before the survey indicated that almost all the second cycle institutions in Ghana have at least a computer lab with internet connection and that each school had the capability of helping SHS students learn with information technologies. The results obtained from the study suggest a different situation especially in the rural areas of the country. From the finding of the study it was realized that, many SHS aside some to the category "A" schools with good computer lab and internet connectivity other schools in the country are also deprive of such resources. Per the findings of the research, the two well-known schools in the Oti-region of Ghana that were used for the research are without a computer lab or a lab with faulty computers. Even with the fact that some teachers and students were having their personal machines it cannot be generalized

because not all are at an advantage. This integration of ICT into teaching and learning seams difficult since without the tools one cannot integrate them in teaching and learning.

The responses from the participants in the study revealed that they did not have access to ICT facilities needed for Integration of ICT in lessons especially in the less privilege schools. The results revealed that the limited number of computers in the participants' schools did not promote the use of ICT in lesson delivery and explain various concepts could not be well explained using ICT. Also the unavailability of Internet services made it difficult for students and teachers in making their research and unable to network the school to aid collaboration between teachers and students.

All respondents are pointing to lack of resources as one of the reasons why they are unable to use ICT in their teaching and learning activities.

5.3 Conclusion

Conclusions were made based on the following research questions.

- What are the challenges associated with the use of ICT for teaching and learning in Bueman senior high school and Presbyterian Senior High School?
- What perceptions do teachers and students have on the use of ICT tool for teaching and learning in Bueman Senior High School and Presbyterian Senior High School?
- What are the ICT tools available for teaching and learning in Bueman senior high school and Presbyterian Senior High School?

The study was conducted to examine the challenges, perception and availability of resources in integrating ICT in teaching and learning in Senior High Schools in Ghana. As a result it was confirmed that relating to the challenges, ICT infrastructure (100.0%), limited access of ICT hardware and software (73.5%), lack of competent ICT staff (61.5%), poor (53.8%), little government funding (53.8%) and lack of practical training (53.8%) are the most critical challenges faced in the course to use ICT in teaching and learning. If the above mentioned challenges are solved the integration can now be successful.

It was also found out that, both teachers and students' perception are positive about ICT integration in Senior High Schools in Ghana. The reason for the above perception was on the fact that, respondents believe ICT integration is a means to reduce their workload as teachers and also open them to a broad platform of information online. The perception displayed by teachers has been influenced by the high advantage the integration of the course will bring to the schools community thus how it will motivate teachers and students to render their activities, how it will increase collaboration between students and their teacher and how the use of the internet can help explain tedious concepts than the library.

5.4 Recommendations

Based on the conclusions of the study the following recommendations can be suggested the following:

a) The availability of ICT tools such as computers is meaningless unless an enabling environment is created for its use. As such, there is the need to facilitate the expansion of physical infrastructure of Ghana, including those of power and transport. Emphasis should be on rural areas where most schools lack the infrastructural development. More so, there is the need to facilitate the development, expansion and the modernization of the

nation's communications infrastructure to achieve universal service and access to basic and value-added telecommunications. Alternative power source e.g., generators, solar panel, etc should be provided in all the schools.

b) Similarly, there is the need for the provision of internet services to schools. This will enable teachers to do more research to enhance quality teaching as well as enable students to access online learning materials. More sensitization programs should be introduced to educate and expose people to the available information sources and learning resources. Learning materials like books should be made available on handheld devices for students, teachers and education officers. Each school should have a computer laboratory for effective learning of ICT.

c) The researcher recommends that all teachers in the service to be taken for refresher courses in ICT. This would equip all of them with new ICT skills which would make it easier to use the ICT infrastructure in teaching and learning in secondary schools.

d) The government and NGO's should assist Senior High schools with the necessary ICT infrastructure facilities. This would ensure common take off and even use of ICT infrastructure in teaching and learning in all the Senior high schools

e) The government should ensure there are enough ICT trained technician provided pair ICT infrastructure facilities when they breakdown. This would ensure that once ICT facility broken down they are repaired for continuous use in teaching and learning in the schools.

f) The government should ensure that facilities are distributed evenly to schools regardless of the category of the school. This will ensure that, all the students from all senior high school in the country are exposed to the necessary facilities for integration of ICT into teaching and learning.

5.5 Suggestions for further study

The studies was conducted only covered a small geographical area of the country thus out of the hundred and seventy districts of the country is only two schools within a district that was covered, therefore finding could not be generalized. However, similar studies could be conducted in other districts in the region or a whole region or two could be used for the studies on larger base to allow generalization.

Reference

Adebi-Caesar, T. E. (2012). *Assesment of I.C.T Situations In Senior High Schools.* Kumasi: Kwame Nkrumah University.

Aguele, L. I. (2007). Information and communication technology in universities in Nigeria: Challenges for . *Retrieved on January, 4th, 2015.*

Agyemang1 M. and Mereku2, D. K. (2009). Technology use among Ghanaian Senior High School mathematics teachers and the factors that influence it . *African Journal of Educational Studies in Mathematics and Sciences*.

Amoaful. (2011). One Laptop policy in Ghana.Any Impact on Teaching and learning. *Library philosophy and practice*, 3.

Andoh, C. (2012). Factors influencing teachers' adoption and integration of information andCommunication technology into teaching. *International Journal of Education and Development using Information andCommunication Technology (IJEDICT), 2012, Vol. 8, Issue 1,*, pp 136-140.

Andy, J. (2004). A review of the research literature on barriers to the uptake of ICT By teachers, BectaICT Research. *European Journal of Education Studies -Volume 3*.

AnnreethaAnthony. (2004). Teaching and Learning with ICT Tools:Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*.

Aviram Richard, T. D. (2004). The Impact of ICT on Education:The three Paradigm, the Lacking Discourse. *Unpublished menuscript, Beer-Sheva University of Isreal*.

Becta. (2004). A Review of the Research Literature on Barriers to the Uptake of ICT by Teachers. *ournal of Education and Practice*, http://www.becta.org.uk/page_documents/research/barriers.pdf.

Bingimlas. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments: A review of the l. *Eurasia Journal of Mathematics, Science and Technology Education*, 5(3),235-245.

Bingimlas, K. A. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments. *A Review of the Literature. Eurasia Journal of Mathematics, Science & Technology Education*.

Bingimlas, K. A. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments. *A Review of the Literature. Eurasia Journal of Mathematics, Science & Technology Education*.

Bingimlas, K. A. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments: A Review of the Literature. *Eurasia Journal of Mathematics, Science & Technology Education*.

Briker, D. (1995). *A rational for ICT integration in schools.* Baltmore: University Park Press.

Bryman A, B. E. (2007). *oxford university press, 2nd edition.* oxford university press.

Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2012, Vol. 8, Issue 1, pp. 136-155.*

D, R. (2015). Impediments of E-commerce Adoption among Small and Medium . *International Journal of Information Technology and Business Management* , 32.

Dankwa. (1997). The Information Technology Challenge in Teaching Senior High School Geography in Ghana.

Dankwa, W. A. (1997). SchoolNet: A catalyst for transforming education in Ghana. *Retrieved from https://www.isoc.org/inet96/proceedings/c6/c6_1.htm*.

Dattolo, A. (2008). formalizind a model to represent and visualize concept spaces in e-learning environments. *Journal of interlligent systems*.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Access provided by University of Education*.

Eickelmann, B. (2013). Teachers‘ attitudes and beliefs regarding ICT in teaching and learning in European countries.

Farren, M. &. (2015). The transformative potential of action research and ICT in the second language (l2) classroom.

Fathima, S. ((2013)). Challenges of ICT in teaching learning process. . *International Journal Of Engineering And Science*, 2, 51-54.

Fraenkel, J. R. (2000). *How to design and evaluate Research.* Boston:McGrew-Hill: 4th ed.

Guha, R. (2000). Teachers global percerption on Teacing And Learning. 99:367-70.

Guha, S. (2000). Are We All Technically Prepared?Teachers' Perspective on the Causes of Comfort or Discomfort in Using Computers at Elementary Grade Teaching.

Hsu, P. (2016). Examining current beliefs, practices and barriers about technology integration: A case study. TechTrends. *doi:http://dx.doi.org/10.1007/s11528-015-0014-3*, 60(1), 30-40.

Isaac, T. (2006). Factors contributing to ineffective teaching and learning in primary schools: Why are schools in decadence? *Journal of Education and Practice*.

Jamieson-Procter. (2013). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International Journal of Research in Education and Science*.

Jamieson-Proctor, R. M. (2013). ICT integration and teachers' confidence in using ICT for teaching and learning in Queensland state schools. *Australasian Journal of Educational Technology*, 23(4).

k, B. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments: A review of th Literature. *Eurasia Journal of Mathematics, Science andTechnology Education,*, 5(3), 235-245.

Koehler, M. &. (2009). What is technological pedagogical content knowledge (TPACK). *Comtemporary issues in Technology and Teacher education*, 60-70.

Korte, W. B. (2007). Benchmaking access and use of ICT in european Schools 2006. *Results fron headteacher and a clacc teacher survey in 27 European countries*, 2(1),1-6.

Kothari, C. (2004). *Quantitative Techniques.* New Delhi: Vikas Publishing House Pvt.Ltd.

Kozma, R. (2003). Technology and classroom practices:An International Study. *Journal of Research on Technology in Education 1*, 7-12.

Kumekpor, K. (2002). *Research Methods & Techniques of of Social Research.* Accra,Ghana: SonLife Printing Press and Services.

Kuntundu, R. D. (1998). *The Use and Sustainability of Information Technology In Academic and Research Libraries in Tunzania.* South Africa: University of Natal Pietermaritzburg.

Laffir, F. (20113). The Use of ICT in Teaching And Learning At Makere University. *Reprosebtralen, universitetet i oslo*, pp 30.

Leedy, P. (1993). *Practical Research: Planning and Design.* New York: Macmillan publishing Company.

Livingstone, S. C. (2015). Covering traditions of research on media and information literacies, disciplinary, critical and methodological issues. *The London school of Economics and Political Science*.

Lowder, S. K. (2020). Assessment of outcomes based on the use of PIM-supported foresight modeling work. *ntl Food Policy Res Inst. https://doi.org/10.2499/p15738coll2.133608* .

M. Johnson, M. E. (2016). Challenges and solutions when using technologies in the classroom. *Adaptive Educational Technologies forLiteracyInstruction*.

Mensah, L. (2012). *Ghana Aims to Improve Public, Rural Schools in 2011*.

Mereku, D. K.-M.-M. (2009). Pan African Research Agenda on the Pedagogical Integration of ICTs: Ghana Report. *Retrieved from http://www.ernwaca.org/panaf/pdf/phase-1/Ghana-PanAf_Report.pdf*.

Mfum-Mensah, O. (2003). Computers in Ghanaian Secondary Schools: Where does equality come in? *Current Issues in Comparative Education*, 6(1), 40-49.

Mfum-Mensah, O. (2003). Computers in Ghanaian Secondary Schools:Where does equality come in?

Ndume, V. T. (2008). Challenges of adaptive e-learning at higher learning institutions: A case study in Tanzania. International Journal of Computing and ICT Research. *A case study in Tanzania. International Journal of Computing and ICT Research*, 2(1), pp 47-59). .

Newhouse, C. P. (2002). A framework to articulate the impact of ICT on learningin schools‘. *Literature review for the western Australian department of education.*

Opoku, B. &. (2016). Inadequacy of ICT infractructure to improve teaching and learning. *Posited in the University Of Ghana Legon, Not yet publised*, 16-27.

Ottenbreit-Leftwich, A. T. (n.d.). Teacher Technology Change: How Knowledge, Confidence, Beliefs, and Culture Intersect. *2010*.

Parthemore, J. (2003). A secondary school computer lab in rural Brong Ahafo: A case study reflection on the future of secondary school computer literacy and computerbased distance education in Ghana. *[Online]*. *Available: http://www.wess.edu.gh/lab/reports*.

Pelgrum. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers & Education*.

Pelgrum, W. J. (2001). 'Obstacles to the Integration ICT in Education: Results from a Worldwide Educational Assessment. *Computers and Education*, 37(2), 163-178.

Preston. (2000). Exploring the extent of ict adoption among secondary school teachers in malaysia .

Robson, C. (1993). *Real World Research: A resource of social scientist and practitioner researchers.* Oxford: BlackWell.

Rogers, D. P. (2013). The Motivational Effects of ICT on Pupils.

Rogers, E. M. (2003). Diffusion of innovations (4thEd.). *New York, Free Press.*

Rumanyika, J. a. (2015). Impediments of E-commerce Adoption among Small and Medium . *International Journal of Information Technology and Business Management* , 32.

Rumanyika, J. D. (2015). Challenges for Teaching and Learning Information and Communication Technology Courses in Higher Learning Institutions in Tanzania: A Review. *Journal of Information & Knowledge Management*.

Russell, B. a. (1997). Exploring the extent of ict adoption among secondary school teachers in malaysia. *International Journal of Computing and ICT Research, Vol. 2, No. 2, December 2008.*

Simin Ghavifekr, A. Z. (2012). ICTIntegration In Education: Incorporation for Teaching & Learning Improvement. *The Malaysian Online Journal of Educational Technology*.

Syomwene, A. (2017). Change and management of change in curriculum. *Core Principles in curriculum. Eldoret: Utafiti Foundation.*

Thomas, L. (2020). *An introduction to simple random sampling.* scribbr.

Yan, B., & Zhao, Y. (2006). *Benefits or problems, what teachers care about most when integrating technology? Paper presented at the 2006 American Educational Research Association Annual Meeting, San Francisco, California*

APPENDICES
APPENDIX I

UNIVERSITY OF EDUCATION WINNEBA

DEPARTMENT OF ICT EDUCATION

A QUESTIONNAIRE ON ASSESSMENT OF THE USE OF ICT FOR TEACHING AND LEARNING IN SENIOR HIGH SCHOOLS IN GHANA, A COMPARATIVE STUDY IN BUEMAN SENIOR HIGH AND PRESBYTERIAN SENIOR HIGH SCHOOL, JASIKAN MUNICIPAL OTI-REGION

Dear Sir,

We are investigating the use of ICT for teaching and learning in senior high schools in order to complete our research work. I will entreat you to spare some time by completing the questions to help me achieve this objective. All responses will be treated with confidentiality.

Thank you in advance.

PERSONAL DATA

1. School

a. Bueman Snr. High Sch. [ ] b. Presbyterian Snr. High Sch. Jasikan [ ]

2. Gender: Male [ ] Female [ ]

3. Age : Under 25 [ ] 26 – 30 [ ] 31 – 35 [ ] 36 – 40 [ ] 41 – 45 [ ]46 – 50 [ ] 51 – 55 [ ]55 – 60 [ ]

4. Highest educational level attained HND [ ] Post Diploma [ ] 1st Degree [ ] Masters [ ]

5. How long have you been teaching? 0 – 1 yrs [ ] 2 – 5 yrs [ ]6 – 10 yrs [ ]11 – 15 yrs [ ]15 & above [ ]

6. Teachers preferred teaching style conventional/Traditional [ ] Modern/contemporary [ ]

CHALLENGES OF TECHERS

Please use the likert scale below to indicate your level of agree or disagreement with the following statements tick[√] just one within a row to indicate agreement

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
7.	Limited access to ICT hardware and software				
8.	Weak government policies				
9.	Poor ICT infrastructure				
10.	Lack of competent ICT staff				
11.	Poor institutions coordination and curriculum variation/dynamics				
12.	High costs imposed on ICT tools				
13	Little government funding				
14.	Reluctance to use ICT tools in teaching and learning ICT				
15.	Lack of practical training				
16.	Limited time allocation to ICT courses				

PERCEPTION OF TEACHERS

. Please use the likert scale below to indicate your level of agree or disagreement with the following statements tick[√] just one within a row to indicate agreement

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
17.	Using ICT to teach is time consuming.				
18.	Internet use can improve your teaching skills.				
19.	ICT should be integrated into learning.				
20.	All my teachers are very competent in using ICT for teaching				
21.	I prefer using the internet to prepare my lessons than to use the library				
22.	ICT tends to increase students 'learning motivation				
23.	ICT can enhance students' language and writing skills (e.g. grammar, spelling, punctuation, etc)				
24.	ICT can enhance collaboration among students and teachers				
25.	Students' pay less attention when ICT is used in teaching.				
26.	Students' makes no effort for their lesson if ICT is used in teaching.				
27.	I think the use of ICT helps to prepare teaching resources and materials.				

AVAILABILITY OF ICT FACILITIES

28. Do you have a computer of your own? a. Yes [ ] b. No [ ]
29. Do you have a computer lab in your school?
    a. Yes [ ] b. No [ ] c. Not aware [ ]
30. If yes, what purpose does it serve? (Tick as many as you can)
    a. Teaching ICT[ ] b. Teaching other Subjects [ ] b. Browsing and Research [ ] c. Not aware [ ]

31. Are the computers connected to the internet? a. Yes [ ] b. No [ ]
32. If yes, is there access to the internet always?
    a. Yes [ ] b. No [ ] c. Sometimes [ ] d. Not aware [ ]
33. Are there enough computers in your computer lab for all students?
    a. Yes [ ] b. No [ ]
34. How often do you get access to the computer lab? (Please tick as many as you can)
    a. During ICT lessons [ ] b. During break times [ ] c. During close of school [ ]
    d. During other lessons [ ] e. All the time [ ] f. Not at all [ ]
35. Does your school provide frequent system maintenance?
    a. Yes [ ] b. No [ ] c. Not aware [ ]

THANK YOU FOR PARTICIPATION

APPENDIX II

Questionnaire for Students

UNIVERSITY OF EDUCATION WINNEBA

DEPARTMENT OF ICT EDUCATION

A QUESTIONNAIRE ON ASSESSMENT OF THE USE OF ICT FOR TEACHING AND LEARNING IN SENIOR HIGH SCHOOLS IN GHANA, A COMPARATIVE STUDY IN BUEMAN SENIOR HIGH AND PRESBYTERIAN SENIOR HIGH SCHOOL, JASIKAN MUNICIPAL OTI-REGION

Dear student,

We are investigating the use of ICT for teaching and learning in senior high schools in order to complete our research work. I will entreat you to spare some time by completing the questions to help me achieve this objective. All responses will be treated with confidentiality.

Thank you in advance.

Please answer the questions by ticking or providing an appropriate answer.

SECTION A

PERSONAL INFORMATION:

1. School

Bueman Snr. High Sch. [ ] Presbyterian Snr. High Sch. Jasikan [ ]

2. Gender: Male [ ] Female [ ]

3. Form: One [ ] Two [ ]

4. Course General Arts [ ] Visual Arts [ ] Home Economics [ ] Business [ ] Science [ ]

SECTION B

PERCEPTION OF STUDENTS

. Please use the likert scale below to indicate your level of agree or disagreement with the following statements tick[√] just one within a row to indicate agreement

NO	ITEMS	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
5.	Internet use can improve your learning				
6.	ICT should be integrated into learning				
7.	Using ICT to learn is time consuming				
8.	All my teachers are very competent in using ICT for teaching				
9.	I prefer using the internet to learn than to use the library				
10.	ICT tends to increase students 'learning motivation				
11	All my teachers are very competent in using ICT in teaching the students				
12.	ICT can enhance collaboration among students and teachers				
13.	ICT tends to increase students' learning motivation				
15.	Using ICT to learn is time consuming.				
15.	ICT can enhance collaboration among students and teachers				

SECTION C

AVAILABILITY OF ICT FACILITIES

16. Do you have a computer of your own? a. Yes [ ] b. No [ ]

17. Do you have a computer lab in your school? a. Yes [ ] b. No [ ] c. Not Aware [ ]

18. If yes, what purpose does it serve? (Tick as many as you can)

a. Teaching ICT [ ]

b. Teaching other subjects [ ]

c. Browsing and research [ ]

d. Not Aware [ ]

19. Are the computers connected to the internet? a. Yes [ ] b. No [ ]

20. If yes, is there access to the internet always? a. Yes [ ] b. No [ ] c. sometimes[ ]. d. Not aware[ ]

21. Are there enough computers in your computer lab for all students? a. Yes [ ] b. No [ ]

22. How often do you get access to the computer lab? (Please tick as many as you can)
a. During ICT lessons [ ]
b. During Break time [ ]
c. During close of the school [ ]
d. During Other lessons [ ]
e. All the time [ ]
f. Not at all [ ]

23. Does your school provide frequent system maintenance?

a. Yes [ ] b. No [ ] c. Not aware[ ]

SECTION D

CHALLENGES RELATED WITH THE USE OF ICT.

25. What are some of the problems you face when using ICT? (Please tick as many as you can)

    a. Power fluctuation [ ] b. Virus attack [ ] c. System breakdown [ ] d. Lack of maintenance [ ] e. Obsolete (Old) computers
    d. Other……

26. Please write any comments or suggestions you have about the use of ICT for teaching and learning.
    ……
    ……

THANK YOU FOR PARTICIPATIO