UNIVERSITY OF CAPE COAST

BASIC SCHOOL TEACHERS' LEVEL OF COMPUTER LITERACY AND ATTITUDE TO THE USE OF COMPUTERS: A CASE STUDY IN JOMORO DISTRICT

ELISHA D'ARCHIMEDES ARMAH

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BY

ELISHA D'ARCHIMEDES ARMAH

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DECLARATION

Candidate's Declaration

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

Candidate's Signature : …… Date: ……

Name: Elisha D'archimedes Armah

Supervisor's Declaration

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

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

Name: Mr. Paul Dela Ahiatrogah

ABSTRACT

The purpose of this study was to investigate the basic school teachers' level of computer literacy and attitude to the use of computers. The sample of the study covered 30 basic schools (20 public schools and 10 private schools) in Jomoro District. In all 105 teachers participated in the study. Three research questions were formulated. In relation to the research questions, 4 other statistical hypotheses were also formulated and tested for the study. Descriptive statistics were adopted for presenting and analysing the data in this study. The patterns in the responses from the sample were summarized by the use of frequency tables and percentages. However, inferential statistics was used, where necessary, to determine if the patterns described in the sample can be applied to the population from which the sample is drawn. This formed the basis of the analysis. The study showed that teachers in basic schools in Jomoro District in the western region of Ghana lack fundamental concepts, knowledge and skills for applying technology in educational settings. Another finding of the study was that significant differences were found to exist between males and females in their familiarity with some types of ICT tools. The study also showed that teachers major subject area, and the amount of teaching experience had no effect on teachers' familiarity with ICT. Finally, the study also found that teachers who teach in Public schools did not differ significantly in their familiarity with ICT tools than Private school teacher.

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DEDICATION

To my dear wife, Jane Blankson, and my lovely children, Benedict Jason Armah and Elisha Armah (Jnr).

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CHAPTER 1

INTRODUCTION

Background to the Study

Research in developed countries supports the use of computers in the learning environment. The computer's effectiveness as an educational tool is enhanced by its ability to make information individualized, interactive and asynchronous. Compared to teachers, the computer is infinitely patient, free of prejudice, and capable of scrupulously monitoring each student's progress. It is also capable of replacing many skill-oriented classroom activities thus freeing the teacher from time-consuming drill and practice work to focus on interpersonal and group activities.

Therefore, the use of computers in education opens a new area of knowledge and offers a tool that has the potential to change some of the existing educational methods. As computer use continues to increase in society, educators must also prepare for the use of computers within the classroom. This involves all levels of education, including elementary schools. In Ghana, although ICT facilities are used in most organizations and educational sector as administrative tool, its potentials in the teaching and learning process was realized at the national level in 2002 under the national ICT policy in Education in Ghana.

In January, 2002 President J. A. Kuffour set up a Committee to review the entire education system of the country with the view to arriving at decisions that

would make the system responsive to the challenges of the Twenty-First Century. The Committee chaired by Professor Jophus Anamuah–Mensah, recommended the introduction of ICT at all levels of the educational system and stated the following as its objectives.

1. Make all students and pupils computer literate at all levels of the educational system
2. Provide career opportunities for talented Ghanaians and others to participate in ICT knowledge generation.
3. Improve the administration and management of educational institutions through effective use of ICT tools in their day to day operations

These objectives were set to cover all learners at all levels of the Ghanaian educational system yet, in reality a critical observation of the use of ICT in the teaching and learning process showed that much concern is on the learners and ICTs more than the teachers. It has been observed that even in situations where teachers have been trained in the use of ICT, the integration of these technologies in the teaching of subjects has been weak because of a number of reasons which include; absence of systematic management support; lack of ownership by schools; lack of integration into existing curriculum and textbooks; teacher overload and lack of incentives and motivation; lack of ICT-based materials that are truly interactive for teachers to use and shortage of personnel.

The absence of policies and management support to the use of ICT in schools is hindering the progress of the use of ICT in the classrooms. It is not uncommon that one comes across computers in schools not being used

because they are out of order and there is no technical support to repair them; the computers cannot be accessed because they are locked away in computer rooms after school hours; or there is lack of funds for developing educational software to make the hardware become productive.

Computer technology has become a fundamental part of education in Ghana and will likely be more so in the future. Unfortunately, Information Technology innovation initiatives in Ghana are still characterized by a lack of research into possible options for policies and strategies. It seems there has been no evaluation, of the use of the computer in the teaching and learning process. If any, very little is known about the extent of use of computers in teaching and learning at all and the factors affecting the use of computers, or the effectiveness of the in-service programs.

The challenge confronting our educational systems is how to transform the curriculum and teaching-learning process to provide teachers with the skills to function effectively in this dynamic, information-rich, and continuously changing environment. ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centred and text-bound classrooms into rich, student focused, interactive knowledge environments. To meet these challenges, learning institutions must embrace the new technologies and appropriate ICT tools for learning.

Statement of the Problem

The education system in Ghana is viewed as the prime mover in the development of the country. Consequently, the education system is set to embrace the challenge to produce a society and a workforce that is equipped

with the knowledge and skills to utilize new communication technologies in both contemporary and innovative ways. At present, the Ghanaian government is embarking on a "revolution in education" as part of its ongoing programme in the 2007 educational reform. The thrust of this "revolution" is a mass campaign in computer literacy whereby every school will have access to a computer. (Ministry of Education Science and Sports, 2007).

While information and communication technology (ICT) is not a panacea for all educational problems, today's technologies are essential tools for teaching and learning. To use these tools effectively and efficiently, teachers need visions of the technologies' potential, opportunities to apply them, training and just-in-time support, and time to experiment. Only then can teachers be informed and confident in their use of new technologies. As new concepts of learning evolves, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills. Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching. These challenges ask teachers to continuously retrain themselves and acquire new knowledge and skills while maintaining their jobs (Carlson & Gadio, 2002).

Then what can be done to help teachers meet these challenges? In fact, there has been increasing evidence that ICT may be able to provide more flexible and effective ways for lifelong professional development for today's teachers. In line with the issues discussed, it is the researcher's wish to look at teachers'

level of computer literacy and attitude to the use of computers in Jomoro district concerning the new Educational reforms.

Purpose of Study

We live in a time change. Murphy & Terry (1998) indicated the current of change move so quickly that they destroy what was considered the norm in the past, and by doing so, create new opportunities. With the increasing emphasis on the requirement for teachers to become proficient in the use of ICT, the purpose of this study therefore was to investigate the basic school teachers' attitudes towards Information and Communication Technology (ICT). The second purpose was to investigate the computer literacy level of basic school teachers in ICT. Another purpose of this study was to investigate whether gender, major subject area, years of teaching experience, and school status differences affect teachers' level of computer literacy.

Research Questions

The following research questions were formulated to guide the study:

1. What is the level of computer literacy among basic school teachers in Jomoro District?
2. What are teachers attitude towards the use of computers in basic education schools in Jomoro District?
3. Do gender, major subject area, years of teaching, and school status differences affect teachers' level of literacy in computer technologies?

Hypotheses

In relation to the research questions, the following statistical hypotheses were formulated and tested:

1. Ho: There is no statistically significant difference between male and female teachers' level of literacy in computer technologies.
2. Ho: There is no statistically significant difference between public and private school teachers' level of literacy in computer technologies
3. Ho: There is no statistically significant relationship between teachers' major subject area and their level of literacy in computer technologies.
4. Ho: There is no statistically significant relationship between teachers' years of teaching and their level of literacy in computer technologies.

Significance of the Study

Information and Communication Technology is the driving force in the information intensive global society. The outcome of the study may serve as a good basis for the development of supportive programmes to basic school teachers which could be replicated in all regions of Ghana. Again, the outcome of the study will also help educational policy makers to plan proper policies concerning the training of basic school teachers in the proper use of computers and how to use it to enhance teaching and learning processes in their schools. The findings of the study will also help identify teachers who lack necessary competence in integrating ICT in their respective subject areas, and also, those with psychological problems. Such groups of teachers can then be targeted and provided with workshops or other remedial intervention to increase their efficiency and confidence in ICT. Finally, the

outcome of the study may serve as a resource material for students who may undertake similar studies in future.

Delimitation

The study is to determine basic school teachers' to look at teachers' level of computer literacy and their attitude to the use of computers in Jomoro district. The focus of this research is not to conduct a study into defining a National Educational Technology Standards for teachers. This study will also not look at the integration of ICT in the teaching and learning processes.

Operational Definition of Terms

The term Information and Communication Technology (ICT) covers a broad range of technologies including traditional ones, which are introduced across the world. In this study, ICT is limited to digital technologies, which include salient features such as multimedia, interactivity, simulation, networking, e-learning methodologies, and the use of computer hardware, its accessories and software programs.

Attitude - someone's opinions or feelings about something.

Literacy - the ability to read and write. In this study, computer literacy is referring to someone's having a knowledge and understanding of computers and their uses.

Private schools – all schools owned and financed by an individual or group of persons

Public schools – All schools owned and financed by the state or government.

Organization of the content of the Dissertation

The present work consists of five chapters: Chapter 1 is a general introduction of the study. It includes a background to the problem statement of the problem, purpose of the study, research questions, and research hypotheses, significance of the study, limitation and delimitations. Chapter 2 is a review of the literature relating to issues raised by the study. Chapter 3 entails a detailed description of the methodology used for the study. Chapter 4 presents and analyses the collected data, based on the research questions and hypotheses. Chapter 5 summarizes the findings and makes recommendations and conclusions, based on the findings of the study. Suggestions are put forward for further research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter is designed to acquaint the reader with existing studies because the researcher is aware that this is not the first time people have thought of the problem of teachers and ICT. Learning from existing literature will enable the researcher to build upon what has already been done and also establish the possible need for the present research. For easy reference and better understanding, literature is reviewed under the following relevant headings:

1. The Ghana National ICT in Education Policy
2. ICT in Education and schooling
3. Teachers' beliefs and attitudes to ICT in Education
4. Gender Differences in Attitude towards Information Technology

The Ghana National ICT In Education Policy

It is acknowledged that for Ghana to make any appreciable progress in its socio-economic development efforts, substantial resources will need to be directed at improving educational delivery. The key role that Information and Communication Technologies (ICTs) can play in widening access to education to a wider section of the population and literacy education for facilitating educational delivery and training at all levels has been recognized as a key priority area under the current Education Reforms (2007).

International experience from both developed and developing countries have shown that these technologies have an enormous potential for knowledge dissemination, knowledge acquisition, effective learning and the development of

more efficient education services. The government of Ghana therefore drew an ICT in Education policy. This ICT in Education Policy is seen as an epitomised version of the ultimate goal of transforming the educational system by the Ministry and its sector stakeholders. The Policy document therefore seeks to provide policy directions for what needs to be done, as well as the general framework in terms of how it will be implemented.

This policy document seeks to inform sector stakeholders as to why Information and Communication Technologies (ICTs) are an important part of our modern society and the role it plays in the education sector. The policy also seeks to underpin the vision and mission of the then Ministry of Education, Science and Sports with a view of identifying how the sector will use ICTs to develop the requisite human resources for the country which will meet the demand of the labour market, locally as well as internationally.

The Mission of this policy will be to:

> Articulate the relevance, responsibility and effectiveness of utilizing Information and Communication Technologies (ICTs) in the education sector, with a view to addressing current sector challenges and equipping Ghanaian learners, students, teachers and communities in meeting the national and global demands of the 21st Century. (National ICT In Education Policy p.8)

However, the overall goal of the ICT in Education Policy is to:

> Enable every Ghanaian to be able to use the ICT tools and resources confidently and creatively to develop the skills and knowledge needed to achieve personal goals and be full participants in the global economy by 2015. (National ICT In Education Policy P.13)

The policy goals as adapted from the National ICT for Accelerated Development (ICT4AD) Policy document will therefore include:

1. Facilitating the deployment, utilisation and exploitation within the educational system to improve on educational access and delivery to support teaching and learning from the primary level upwards
2. Modernise the educational system to improve the quality of education and training at all levels of the educational system and expanding access to education, training and research resources and facilities.
3. To orient all levels of the country's educational system to the teaching and learning of science and technology in order to accelerate the acculturation of science and technology in society and produce a critical mass of requites human resources and a well informed citizenry.
4. To achieve universal basic education and improve the level of basic and computer literacy in the country.
5. To ensure a population in which all citizens are at least functionally literate and productive.
6. To expand and increase access to secondary and tertiary education.
7. To strengthen science education at all levels and in all aspects of the educational system, especially at the basic and secondary levels.

Even though, the new 2007 educational reforms has taken off, the ICTs are not in place and basic schools are not equipped with computers.

ICT in Education and Schooling

Planning for the effective use of Information technologies is crucial if they are to have the positive impact expected. Investing in ICTs is a costly decision for any country, whether developed or developing. For developing countries such as Ghana, investing in ICTs presents the dilemma of spending scarce/valuable resources on ICTs or consequently suffering from widening technological gap. As noted by Swarts (2006) ICTs can be powerful, essential tools for learning: understanding, interpreting and communicating about the real world OR they can be black holes into which we pour our money, intelligence and time, getting very little in return.

If effectively used, ICTs can amongst other things provide multiple avenues for professional development of both pre-service and in-service teachers, especially through distance education. He contued that it will facilitate improved teaching and learning processes as well as improve teacher knowledge, skills and attitudes and even inquiry. He went further to say that information technologies improve the consistency and quality of instruction both for formal and non-formal education as well as promote inclusive education by addressing inequalities in gender, language, disability.

However, effectively integrating ICTs into educational planning and delivery can be a complicated process, leading to further disparities and

challenges in the system. These may include lack of focus on educational objectives where ICTs are seen as an end itself, rather than a means (tools) to an end. The latest Education Reform in Ghana which has been implemented since 2007 highlights ICTs as an important cross cutting issue in the sector, and seeks to address this through several strategies including : equipping all educational institutions with computer equipment and ICT tools in a prioritised manner; implementing ICT programmes at the pre-tertiary level in a phased approach, starting with schools already possessing adequate laboratories and teachers; gradually expanding to other schools as and when ICT equipment and teachers become available; and adequately resourcing computer science and IT departments in public tertiary institutions to enable them to produce skilled human capital to meet the requirements of the industry. Within these reforms, it is also expected that the introduction of ICT into schools should cover teaching of ICT skills to all students, preparing students for the ICT professions and enhancing teaching and learning through ICTs. (The Ghana National ICT In Education Policy)

Two important matters for consideration in this context are, firstly, the difference ICT has made in education and schooling and, secondly, ICT in terms of home learning resources. On ICT making a difference, one has to question whether the computer and the teacher's word are used very differently from the book and the teacher's word or the chalk and the teacher's word, where the teacher has the only book. ICT may have a substantial influence on education and schooling, but whether it can indeed make a change in terms of teaching and

learning outcomes is a question involving all parties to the teaching-learning process.

In short, the review of constraints on the use of ICT ,draws our attention to the essential point that the unique socioeconomic and the important characteristics, such as government policy, family size, and home learning resources of particular areas or countries, would affect both the nature and scope of their use of ICT and, in turn, their education, schooling and teacher development.

Teachers' beliefs and attitudes to ICT in Education

The teacher's role in the integration of computers in schools is obviously very important, and every educational reform effort should take into consideration teachers' knowledge, skills, beliefs, and attitudes (Cuban, 2000). Shahan (1976) argues that one important concept of school reform is the human element, which embraces emotions, feelings, needs, beliefs, and pedagogical assumptions. Similarly, Fullan's (1982, 1991, 2000) theory of school change also emphasizes that the alteration of mindsets, such as pedagogical assumptions, values, and beliefs, is a key factor to any educational change effort.

Watt (1980) states that beliefs and attitudes play a fundamental role in the way that teachers deal with ICT in the classroom. In other words, dealing effectively with ICT relates not only to knowledge of the capability, limitations, applications, and implications of ICT, but also to individuals' attitudes and perceptions regarding ICT tools. Veen (1993) stated that the effective implementation of ICT depends upon users' having a positive attitude towards it.

He showed that schools can go only so far to encourage ICT use, and that actual take-up depends largely on teachers' personal feelings, skills, and attitudes towards ICT. This implies that teachers who have positive attitudes toward ICT and perceive it to be useful in promoting learning will evidently integrate ICT in their classroom more easily than others (Sandholtz, Ringstaff, & Dwyer, 1997).

Unfortunately, research evidence (Cuban, 2000; Darling-Hammond, 1990) indicates that technology reform efforts have failed because teachers' beliefs, skills, and attitudes were never taken into consideration. Teacher behavior, though ,is not only a function of their abilities, skills, and attitudes, but also a function of their surrounding work environment.

Several researchers have investigated the impact of users' attitude on their actual usage. The findings of these studies, however, have been mixed and inconclusive. Al-Khaldi & Al-Jabri (1998) attribute this to "the various different measures of belief, attitude, and satisfaction which were employed, sometimes without appropriate theoretical foundation" (p. 24). Further, researchers in the field of information systems have been hesitant to use existing theories and models of other disciplines such as social psychology literature, in studying the relationship between attitude and computer utilization (Davis et al., 1989; Robey, 1979). This reluctance accounts for the mixed and inconclusive support for the hypothesis that computer utilization is influenced by end-user attitudes (Davis et al., 1989; Robey, 1979).Additional research by Brock & Sulsky (1994) showed that attitudes toward computers consist of two distinct factors: (a) belief that the computer is a beneficial tool and (b) belief that computers are autonomous entities.

The researchers found that these two attitudes toward computers have a significant relationship to computer use, with "beneficial tool belief" being stronger than "autonomous entity belief". In other attitude studies, Hebert & Benbasat (1994) found that 77% of the variance of intent to use information technology was explained by three attitude variables. These attitude variables were beliefs related to perceived relative advantage and compatibility with previous work patterns, as well as result demonstrability or observability.

Other studies of teachers' attitudes toward computers have reported that age does influence teachers' attitudes. (Harris & Grandgenett, 1996). For example, Lockheed & Mandinach (1986) reported a serious and significant decline in interest in computing science among high school seniors. They suggested that it may be possible to argue this issue by developing better computer courses. The same conclusion is relevant to computer training courses for teachers (Lockheed &Mandinach, 1986). Yildirim (2000) reported that early childhood teachers significantly differed in their attitudes toward computers on the basis of gender and years of teaching experience. Similarly, another study (Lockheed & Mandinach, 1986) found significant (positive) relationships between years of teaching experience and hours of computer training and between age and microcomputer training. The literature indicates that personal characteristics (gender, age, and ethnicity) have strong impact on teacher attitudes toward computers in mathematics classes.

Some studies suggest that male teachers tend to show slightly more favorable attitudes toward computer use than do females (Dupagne, & Krendi, 1992; Ertmer, et al., 1999). Other studies, however, report little or no

differences in teacher attitudes on the basis of gender (Koszalka, 2001). In general, years of teaching experience and age appear to have impact on attitudes toward computers, the level of knowledge about computers, and willingness to use computers.

Gender Differences in Attitudes towards Information Technology

The issue of the gender gap in IT has caught the attention of many researchers and as a result, numerous studies have been conducted to study the extent of this gap. As early as the 1980s, studies had reported that females exhibited more negative views and perceptions towards the use of computers than males (Koohang, 1987).

Studies reported in the literature over 20 years ago suggested that gender has had a mediating effect on attitudes and perceptions towards IT but it is important to note that IT was an adequate term then when computers were mostly used for mathematical and word processing tasks but today, computers are being used in various facets of life (Mitra et al., 2000). The integration of computers and IT into the education system has greatly influenced the mindset towards IT. Hence, although the literature shows that extensive research related to gender and attitudes towards IT has been carried out over the years; such findings may be irrelevant today because of the ever expanding nature of IT.

The debate over the gender gap that started since the 1980s still persists in the new millennium. Many researchers have revisited this issue and many are continuing to do so. For example, the study by Houtz and Gupta (2001) found significant gender differences in the way females and males rated themselves in

their ability to master technology skills. Even though both genders were positive about their technological ability, males rated themselves higher than females. In another study, Shashaani & Khalili (2001) reported that female undergraduate students had significantly lower confidence than males when it came to their ability to use computers. Females also reported feeling helpless, nervous and uncomfortable around computers. Both genders, however, viewed computers as a useful tool and equally believed that computers had positive effects on individuals and society. Tsai, Lin & Tsai (2001) reported similar results in their study which showed no significant gender differences in the perceived usefulness of the Internet.

Consistent with earlier studies (Houtz & Gupta, 2001; Shashaani & Khalili, 2001), a recent study by Broos (2005) also found significant gender differences - favouring males in terms of attitudes toward new communications technology, the extent of computer use and self-perceived computer experience. Even when females perceived themselves as being more competent in using computers, they expressed higher computer anxiety levels compared to males. This is not surprising as Liaw (2002) study, had also indicated that males had more positive perceptions towards computers and Web technologies than females.

Although they may not provide conclusive evidence of specific gender disparity, all the abovementioned studies, which were carried out among high school or undergraduate students except for Broos (2005), indicated that gender disparity in the use of IT for educational purposes existed to a certain extent. This is definitely a cause for concern as IT is considered a crucial tool for effective teaching and learning in most curricula.

The debate on gender disparity in IT has also been documented by several researchers who recognised the importance of other variables, such as students' computer experiences, socioeconomic status and age, in explaining gender differences. In the case of students' computer experience, Chen (1985) found that females and males responded with similar levels of interest toward computers when they possessed similar amounts of computer experience.

Shashaani (1997) provided further evidence that computer attitudes and related experience were reciprocally related. Shashaani (1997) revealed that students who were more knowledgeable in computers had used computers more frequently and had greater access to home computers. They were also more interested in computers and had more confidence working with them. This suggests that the discrepancy between male and female attitudes can be reduced to a certain extent if computer experience is controlled (Shashaani, 1993; 1997). Kirkpatrick and Cuban (1998) noted that the gender gap was narrowed when both genders were exposed to the same amounts and types of experiences when using computers. On the contrary, Kadijevich's (2000) study found that males exhibited more positive attitudes toward computers than females even when computer experience was controlled. This means that such experience does not necessarily have a mediating effect on computer attitudes.

Most of the early studies revealed that computer experience played a role in narrowing the gender gap while other studies indicated that such experience might be gender-based. Broos (2005), for instance, found that prior computer

experience would only have a positive effect for males. More experienced male users showed greater positive attitudes toward IT while females with equal computer experience reported having computer anxiety. Todman (2000), on the other hand, found that the reduction in computer anxiety for males was more apparent over time than in the case of females.

Summary

The speed with which Information Communication Technology (ICT) is developing and its impact on socio-economic activities cannot be overemphasized, unfortunately in Africa, ICT has barely taken a foothold. Computer illiteracy and lack of access to ICT are widely recognised as an increasingly powerful obstacle to the economic, civic and political development of Africa. According to the UN ICT Task Force, nowhere is the digital divide more pronounced than in countries of the African continent. Africa is the most unconnected in an increasing connected world. This is where Ghana as a country finds itself.

In order that teachers use computer technology, it is essential that they do not see it as a challenge to their professional roles, but as a tool that will make their work easier. Teachers need role models, encouragement, ongoing staff development, time to explore the capabilities of computer technology, and a supportive environment. Specifically, teachers are concerned about what computers will mean to them personally and professionally. More importantly, it is essential that the school culture and resource system be able to promote and

sustain the government's computer technology initiative as in the Ghana National Educational policy.

Given the increasing use of computers in industries today, the inculcation of a technological ethos among teachers and society at large is becoming even more critical. This calls for an urgent revision in the country's teacher education curricula to provide quality teachers to satisfy this demand. Research confirms that teacher quality has a strong impact on the level of academic achievements in developing countries. It stands to reason, therefore, that improved conditions of life in Ghana could come about from the quality of education its citizens receive. To a large extent, this quality of education depends on the professional and technological competence of the country's teachers.

Finally, it is critically important that trained or technologically competent teachers are utilized as a resource in the government's decision-making process. In keeping with the philosophy of participation in development initiatives, teachers' participation in the planning process is key to ensuring the successful implementation of computers in Ghanaian schools. This commitment from teachers to embrace technology is essential in attaining the country's goals for computer use.

CHAPTER 3

METHODOLOGY

This chapter discusses the research design, population, sample and sampling technique, instrument of data collection, validity and reliability of the instrument, pilot study, method of data collection and method of data analysis.

Research Design

Gay & Airasian (2000), notes that the research design indicates the basic structure of a study, the nature of the hypothesis and the variables involved in the study. The study basically aims at gathering information on attitude, knowledge and awareness issues of basic school teachers in Jomoro district. The study will employ the descriptive survey method. Fraenkel & Wallen (2000) observe that the purpose of descriptive research is to observe, describe and document aspect of phenomenon as it naturally occurs. Descriptive research is concerned with the conditions of relationship that exist, such as determining the nature of prevailing conditions, practices and attitude, opinions that are held, processes that are going on, or trends that are developed (Best & Kahn, 1993)Descriptive research involves collecting data in order to test hypothesis or answer research questions concerning the current status of the subject of the study (Gay, 1981).

Amedahe and Gyimah (2002) also maintains that in descriptive research, accurate description of activities, objects, processes and persons is the objective. The design therefore, involves collecting data through administration of questionnaire to elicit information on the current issues on computer technology

attitude, knowledge and awareness by basic school teachers in Jomoro district. The choice of descriptive design by the researcher is due to its merits. According to Best & Khan (1993) , descriptive research is concerned with the conditions or relationships that exist, such as determining the nature of prevailing conditions, practices and attitudes; opinions that are held; processes that are going on; or trends that are developed.

Descriptive survey seeks to find answers to questions through the analysis of relationship between or among variables (Fraenkel & Wallen, 2000). Also, a descriptive survey affords the opportunity to select a sample from the population being studied and make generalization from the study of the sample (Best & Kahn, 1993) Furthermore, the descriptive design often employs the method of randomization so that error may be estimated when population characteristics are inferred from observation of samples. Thus, the findings can form the basis of generalization about the phenomenon studied. Lastly, variables and procedures are described as accurately and completely as possible so that other researchers can replicate the study. Nevertheless, there are difficulties involved in descriptive survey. These include ensuring that the questions to be answered are clear and not misleading, getting of questionnaire completed and returned so that meaningful analysis can be made (Fraenkel & Wallen, 2000). Again descriptive designs are easily influenced by distortions through the introduction of biases to measuring instrument. Finally, it has an element of subjectivity since it is based on personal opinion or judgements. These disadvantages notwithstanding, the descriptive design is considered the most appropriate for carrying out the study on the computer technology awareness by

basic school teachers in Jomoro district and to make generalizations to all the basic schools in Ghana.

Population

Polit & Hungler (1995) defined a population as the entire aggregation of cases that meet a designated set of criteria. The target population for the study was all the basic school teachers (private and public) in Jomoro district (see Appendix A). The Jomoro District, which used to be part of the then Nzema East Municipal was created by Legislative Instrument 1394 in 1988. It is located in the Southwestern corner of the Western Region of Ghana. It is bordered on the North by Wassa Amenfi West and Aowin Suaman districts, Nzema East Municiapl on the East, La Cote d'ivoire to the West and the gulf of Guinea to the South. The size of the district is 1344 sq.km. District Capital is Half Assini. The population of the district is 111348 with a density of 83 persons per sq.km and an annual growth rate of 3%. (2000 PHC Census). (see Appendix B).

Table 1 shows the number of basic schools in the district

Table 1

The Educational Statistics of Jomoro District

Category of School	Private	Public	Total
No. of Pre-School	12	40	52
No. of Primary Schools	12	54	66
No. of JHS	7	38	45
No. of SHS	1	2	3

(source: www.ghanadistricts.com/district1on1/jomoro)

The pupil/teacher ratio in Jomoro district of kindergarten, primary and junior secondary school in the district were found to be 58:1, 46:1 and 25:1 respectively. With regards to staffing it was found that 99.2%, 52.7%, 37.8% and 14.8% of the teachers are untrained in the kindergarten, primary, JSS and SSS respectively. In the district about 62.2% of the population are literate, that means they can read and write and had obtained at least primary education. (2000 PHC Census).

The decision to use the basic school teachers in Jomoro District is based on the assumption that they are likely to lack computer knowledge in ICT because the district is more of rural or remote than urban. The population in the district is more interested in coconut farming than education. The district has a population of 111348 with a density of 83 persons per sq.km and an annual growth rate of 3%. (2000 PHC Census).

Sample and Sampling Technique

Sarantakos (1998) identified some reasons for sampling in a study. Among the lot are “complete coverage of the population may not offer substantial advantage over a sample survey. Sampling provides a better option since it addresses the survey population in a short period of time and produces comparable and equally valid results. With the introductory letter from the Jomoro district Education Office (see Appendix C), and the list of basic schools both private and public, the sample for the study was drawn from all the basic schools both private and public in the district. The stratified random sampling technique, disproportional method, was used to select 30 basic schools from the district. The simple random sampling technique was used to select the quota of respondents from the schools for the study.

To ensure the representativeness of the teacher sampled and for each teacher to have an equal chance of being selected, the serial number of the teachers in each school were written on pieces of paper cut using the same measurement. Each piece of paper was rolled and mixed together. The pieces of paper were then put in a container and the container was given a thorough shaking. The rolled papers were then picked one by one without the researcher seeing the pool. However, this was done with replacement in order to maintain the same probability for each teacher to be picked. Thus when one was picked, it was recorded and put back into the container. In the event where the same number was being drawn twice, the second drawing was ignored and the number was returned to the pool. This was repeated in all the selected schools until the

desired number of teachers was obtained. The result is shown in Table 2. and Table 3.

Table 2

Private Schools Sampled as Well as The Number of Teachers Sampled for The Study

Sr. No.	Name of School	No. Teachers	No. sampled
1	Almighty Basic Prep	10	4
2	Christ the King Basic	11	4
3	Ebenezer Prep Sch.	13	6
4	Ellloyin SDA Basic Sch	12	4
5	Ellubo New Generation Basic	11	4
6	New Gen. Complex Basic	11	4
7	Nuba Annor-Agyei Prep	10	4
8	Psalms Basic Sch	11	4
9	Sakito Prep School	9	3
10	What a Man Academy	9	3
	Total	107	40

Table 3

Public Schools and Teachers Sampled

Sr. No.	Name of School	No. Teachers	No. Sampled
1	Adusuazo Pry & JHS	8	2
2	Ahobre Pry & JHS	9	4
3	Allengenzule Pry & JHS	7	3
4	Anlomatuope Pry & JHS	9	2
5	Atwebanso/Edobo Pry & JHS	12	5
6	Azuleti Pry	6	3
7	Beyin Pry & JHS	12	5
8	Bonyere Cath Pry & JHS	13	5
9	Banyere Meth. Pry & JHS	14	5
10	Compond D/C sch	6	2
11	Egbazo Pry & HIS	9	3
12	Ellenda Pry & JHS	10	3
13	Elubo Pry & JHS	13	5
14	Ezinlibo Cath. Pry & JHS	13	6
15	Half Assini Cath Pry & JHS	14	6
16	Half Assini Meth Pry & JHS	14	6
17	Mpataba Pry & JHS	11	3
18	Nawule Pry & JHS	12	5
19	New Kabenlasuazo Pry & JHS	11	3
20	Tikobo 1 Pry & JHS	12	4
	Total	215	80

Research Instrument

The main instrument for the study was a questionnaire (see Appendix D) Questionnaires are one of the best impersonal observation techniques used for eliciting data (Leedy 1993). Respondents are more likely to respond honestly because of anonymity. Questionnaires were used because it was not possible for the researcher to interview all 120 teacher of the schools covered in the research population. A further reason for using self-administered questionnaires was that, since the schools are scattered across the district, financial, logistical and time constraints would not allow for interviews to be used as the main data collection technique for this research. The questionnaires used for this study are semi-structured, consisting of a mixture of closed and open-ended questions. De Vaus (1991) provides a number of advantages of closed or forced-choice questions.

This is in spite of the problems associated with closed questions, such as providing an adequate range of alternatives to respondents. Another problem is that when a questionnaire is long (as in this study), motivation to answer could be low. De Vaus (1991) states that closed question questionnaires are easier to code and recommends exhaustive alternative responses as a remedy to the problems. Open-ended questions were included in the questionnaires in the present study to determine the general feelings of teachers on ICT issues.

The survey instrument was developed by the researcher after an elaborate literature review . The questionnaire was divided into four parts;

Part One: Demographic Information (1 - 19 items. From Item 10 to 19 was a ‘Yes’ or ‘No’ type of questions)

Part Two: Knowledge of Computer Software (1 - 11 Likert scale items; 1 - I cannot use it, 2 -I can use it to a small extent, 3 -I can use it satisfactorily, 4 -I can use it well and 5 -I can use it very well)

Part Three: Computer Attitudes and Literacy (1 - 15 Likert scale items; 1 – Completely disagree, 2 – Disagree; 3 – Neutral; 4 – Agree; 5 - Completely agree)

Part Four: Computer Technology Literacy (List of items to choose from based on their

The first part focused on the demographic information about teachers, including some descriptions of computer availability in their schools, their computer usage and their level of computer interest.

The second part of the survey instrument focused on participants' knowledge of computer software. In the third part of the survey it measured teachers' computer attitudes. The Part four of the questionnaire focused on what participant teachers consider essential for classroom teaching in the 21st century. In this part, a list of computer devices was introduced to teachers. Teachers were asked to examine the list and answer questions. This part of the survey, also asked teachers to mark each device on the list as familiar or not familiar. This assessed their level of awareness of ICT. The Part four also asked the participants to state their views about the educational computing problems that are facing basic education school system in their schools.

Pre-test for Validity and Reliability

The questionnaires were pre-tested in two schools, Lower town and T. I. Ahmadiya basic schools in Saltpond. The purpose was to test the instruments for validity and reliability, and to determine how realistic the questions were to the ability of teachers. Nevell (1993) stressed the importance of scrutinizing data-gathering instruments to identify ambiguity or misleading questions and for instructions and suggesting improvements. Minor changes were made after the pre-test, in collaboration with the supervisor of the study.

A Likert scale was adopted for measuring computer knowledge and attitudes. The items were tested (SPSS v. 17) for reliability using an internal consistency method (Cronbach's Alpha coefficient, [Cronbach, 1990]) which yielded reliability coefficients of 0.944 and 0.805 for computer knowledge and attitudes respectively. Both of these values are higher than the 0.8 criterion which is regarded as internally reliable (Bryman & Cramer, 1997).

The items were also submitted to lecturers in the field of Information Communication Technology and other researchers in the Department of Educational and Educational Foundations Department, University of Cape Coast who have adequate and expert knowledge of validation of research instruments. All their suggestions were factored into the final questionnaire which was used for the in Jomoro district. Especially, Items 5, and 9 of part one of the questionnaires were modified. Also an open ended Item was added to part four of the questionnaire to elicit information about problems of ICT. This was initially missing in the original questionnaire that was pilot-tested at Saltpond.

Data Collection Procedure

The questionnaires was administered to the teachers personally in their various schools after obtaining permission from the Heads of the schools with the introductory letter from the Jomoro District Education Office(see Appendix B). The administration of the questionnaire was done with the assistance of teachers and Heads of the various schools sampled for the study. The participants in each school were assembled together and were briefed on the purpose of the study and on how to fill the questionnaire. The same procedure was followed in all the schools that participated in the study.

The data collection was done in two phases. Phase 1 was carried out between 10th March, 2009 and 27th March, 2009 and it covered schools along the southern belt of the district. From Ellonyin through Bonyere, Half Assini to Anlomatuope. The second phase which started from 31st March, 2009 and ended on 14th April, 2009 captured schools on the northern part of the district. From Adusuazo , Tikobo No.1 up to Elubo. Out of the 120 questionnaires administered, 105 were retrieved thereby recording a return rate of 87.5%

Data Analysis

Descriptive statistics were adopted for presenting and analysing the data in this study; the researcher summarized patterns in the responses from the sample by the use of frequency tables, percentages and charts. However, inferential statistics (chi-square) was used, where necessary, to determine if the patterns described in the sample can be applied to the population from which the sample is drawn.

An overview of the open-ended responses was done so that responses that expressed similar ideas but were worded differently were put together.According to De Vaus (1991), open-ended questions often produce multiple responses that require the creation of several variables to capture the responses. It is therefore best to construct a number of variables into which responses can be sorted and coded. A multiple response approach was used for coding the open-ended questions in this study. Categories were created from the responses received to a particular question. A code was allocated to a particular category, for respondents' answers.

All the items in Part Two of the questionnaire were assigned weights 1, 2, 3, 4 and 5 for I cannot use it, I can use it to a small extent, I can use it satisfactorily, I can use it well, I can use it very well respectively.

Part Three of the questionnaire was assigned weights 1, 2, 3, 4 and 5 for Completely disagree, Disagree, Neutral, Agree and Completely agree respectively. Some items found in Part four of the questionnaire was coded 1 and 2 for familiar and unfamiliar respectively. All the items in the questionnaire were then computerized. The computerization was done using the Statistical Package for Social Sciences (SPSS v17) now known as Statistical Products and Service Solutions (SPSS v17).

This aspect of the data processing included the definition of variables, keying in of the data using codes and editing the data for missing values and correcting them. Next, guided by the research questions and research hypotheses, the data analysis took the form of organizing the output of analysis done by using the SPSS program into simple frequency tables with the absolute

figures and percentages according to the various research questions. Two types of data analysis were undertaken. The first involved the use of simple percentages in describing participants' demographic data and answering the research questions. Second, inferential statistics was used to analyse the data in order to test the following hypotheses:

1. Ho: There is no statistically significant difference between male and female teachers' level of literacy in computer technologies.
2. Ho: There is no statistically significant difference between public and private school teachers' level of literacy in computer technologies
3. Ho: There is no statistically significant relationship between teachers' major subject area and their level of literacy in computer technologies
4. Ho: There is no statistically significant relationship between teachers' years of teaching and their level of literacy in computer technologies.

For hypotheses 1 and 2, independent samples t-test was used. The independent samples t-test procedure compares means of two groups or cases. Since the samples used for this study came from the same population, it is expected that their means should be roughly the equal. Although, it is possible for their means to differ by chance alone, we would expect large differences between sample means to occur very infrequently. The null hypotheses assume that experimental manipulations have no effect on the participants; therefore, it is expected that the sample means must be the same. In effect, any difference in response is due to the treatment.

The 3rd and 4th hypotheses were tested by the use of multiple regression method. Multiple regression is a statistical technique that allows

one to predict someone's or a group's score on one variable on the basis of their scores on several other variables. It is used to establish relationships between variables. Therefore this method was used to find the relationship between the variable mentioned in hypotheses 3 and 4. All the hypotheses were tested at 0.05 significant levels holding other predictors constant.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents the survey data and analysis based on the research questions formulated for the study. Tables and figures are used to present the findings.One hundred and twenty questionnaires were distributed; however, 105 were recovered representing 87.5% of the total sample. Therefore, the data analyzed in this study is based on 105 respondents.

This study focused on the basic schools' level of computer literacy and their attitude to the use of computers in Jomoro district.

Background Information of Respondents

The questionnaire was administered to teachers of the 30 schools selected for the study. Information on the schools selected for this study is presented in Table 4

Table 4

Number of Schools Selected

Category	No. of basic school in the district	No. of school sampled	Percent (%)
Public	92	20	66.7
Private	19	10	33.3
Total	111	30	100

Table 4 shows that out of the 19 private schools in the Jomoro district, 10(58.8%) were selected for the study in the district. Twenty schools were selected from 92 basic schools in the district representing 21.7% of all public in the district. The number of teachers sampled also varied from school to school depending on the staff strength of the school.

Generally, most of the schools in the urban areas of the district have higher staff strength than the remote schools. Table 5 shows the summary of number of teachers sampled from each category of schools in Jomoro district.

Table 5

Number of Teachers Sampled and Category of School They Belong

Type of school	No. of teachers	Percent (%)
Public	70	66.7
Private	35	33.3
Total	105	100.0

Table 5 shows two categories of respondents took part in the study. 80(66.7%) were from public schools, while 40 (33.3%) were from private schools.

The analysis of the first item of the questionnaire is presented in Table 6. This is about the age distribution of the sample used for the study.

Table 6

Age Distribution of Study Sample

Age	Frequency	Percent (%)
Below 20 years	2	1.9
Between 20 - 29 years	55	52.4
Between 30 - 39 years	23	21.9
Between 40 - 49 years	11	10.5
Between 50 - 59 years	9	8.6
Above 59 years	1	1.0
no response	4	3.8
Total	105	100.0

Table 6 shows that the 55(52.4%) respondents' ages fall within the range of 20 – 29. Data was also collected on the gender distribution of subjects used for the study. Table 7 shows the gender distribution of the respondents.

Table 7

Distribution of gender of Respondents

	Gender	Frequency	Percent (%)
Valid	Male	75	71.4
	Female	28	26.7
Missing	no response	2	1.9
	Total	105	100.0

Out of the 105 respondents, 75(71.4%) are males and 28(26.7%) are female. Two respondents representing 1.9% however, did not indicate their sex. The gender disproportion in the study is due to the fact that there are more male teachers in the schools used for the study than females.

The respondents' subject area of specialization (Table 8) as well as years of teaching experience was considered in the study. This will help make an informed decision about their awareness, knowledge and attitudes towards computers in their teaching. The data on subject area of specialization is reflected in Table 8.

Table 8

Subject Area of Specialization

Subject	Frequency	Percent (%)
English Language	17	16.2
Mathematics	19	18.1
Pre-technical skills	9	8.6
Agricultural science	4	3.8
Social studies	6	5.7
Home Economics	3	2.9
Ghanaian Language	5	4.8
ICT	2	1.9
French Language	2	1.9
Science	7	6.7
RME	2	1.9
Art	2	1.9
More than one subject	12	11.4
No response	15	14.3
Total	105	100.0

From Table 8, it is clear that 17(16.2%) respondents teach English Language and 19(18.1%) teach Mathematics. It is interesting to note that only 2(1.9%) of the respondents have ICT as their subject area of specialization. However, 15 (14.3%) did not indicate their area of specialization. Data was collected on the

teaching experience of respondents used for the study. The data on teaching experience is shown in Table 9.

Table 9

Years of Teaching Experience

No. of years taught	Frequency	Percent (%)
Between 1 - 5 years	63	60.0
Between 6 - 10 years	13	12.4
Between 11 - 15 years	7	6.7
Between 16 - 20 years	4	3.8
Between 21 - 25 years	4	3.8
Between 26 - 30 years	4	3.8
Between 31 - 35 years	1	1.0
Between 36 - 40 years	1	1.0
Above 40 years	1	1.0
No response	7	6.7
Total	105	100.0

Table 9 shows that a greater majority of the respondents 63 (60%) have a teaching experience below 6 years. This indicates that majority of the respondents are youthful in age as shown in Table 6. There was however, one respondent who has 56 years of teaching experience. He is on contract with the Ghana Education Service. He is teaching in a public school.

Research Question 1: What is the level of computer literacy among basic school teachers in Jomoro District?

The researcher wanted to find out about the computer literacy level of teachers in the district. A lack of technical and theoretical knowledge is a barrier to the use of Computer-assisted Learning technology. Specifically, respondents were asked if they use computer or not. The responses to this question are shown in Table 10.

Table 10

The Number of Computer Users

	Status of school					
	Male		Female		Total	
	N	%	N	%	N	%
Yes	33	32.0	3	2.9	36	34.9
No	42	40.8	25	24.3	67	65.1
Total	75	72.8	28	27.2	103	100

From Table 10, majority of the respondents 67 (65.1%) are not computer users while only 36 (34.9%) made up of 33(32%) males and only 3(2.9%) females are computer users. The respondents were asked to indicate whether they enjoy using computers. The result is presented in Table 11.

Table 11

Distribution of Respondents Who Enjoy Using Computers

	Status of school					
	Male		Female		Total	
	N	%	N	%	N	%
Yes	49	48.5	7	6.9	56	55.4
No	24	23.8	21	20.8	45	44.6
Total	73	72.3	28	27.7	101	100

As seen from Table 11, 56 (55.4%) respondents reported that they do enjoy using computers. This is made up of 49(48.5%) male and 7(6.9%) female respondents. Even though, 35% of the respondents (see Table 10) said they are not computer users, according to Table 11, some of them do enjoy its usage. Table 11 also reports that 45 (44.6%) respondents reported that they do not enjoy using computers. From Table 11, 21 (75%) of the female respondents reported that they don't enjoy using computers. An equally large number of male respondents 24 (32.9%) reported that they also don't enjoy using computers. The increasing use of computers in industry places a demand on schools to provide opportunities for computer literacy. As computer users continue to increase in society, educators must also prepare for the use of computers within the classroom. The respondents were teachers in the classroom who are supposed to teach ICT in the basic schools, they were asked this question;

‘Do you think that you are computer literate?’ Table 12 provides information on responses provided by the respondents

Table 12

Distribution of Computer Literacy of Respondents

	Status of school					
	Male		Female		Total	
	N	%	N	%	N	%
Yes	32	43.8	4	14.3	36	35.6
No	41	40.6	24	23.8	65	64.4
Total	73	72.3	28	27.7	101	100

As seen from Table 12, 65 (64.4%) of the respondents reported that they are not computer literate. Only 4 (14.3%)out of the 28 female respondents, reported that they are computer literate. A majority of the women; 24(85.7%) of the female respondents, reported that they are not computer literate.

Table 12 also shows that, only 32 (43.8%) out of the 73 male respondents reported that they are computer literates. A greater majority of the male respondents 41(40.6%) however reported that they are not computer literate. 4(3.8%) of the respondents did not respond to this question

Part two of the survey item asked teachers to do a self–report on their knowledge regarding various software programs.

Respondents were asked to do a self-report on their knowledge regarding various 'common-use' computer software programs. These 'common-use' computer software programs are MS Word, MS Access, MS Excel, MS PowerPoint and MS Publisher. The result of this measure of respondents' knowledge in the common-use application software is shown in Table 13.

Table 13

Common-use Application Software Programs

Software	I cannot use it		I can use it to a small extent		I can use it satisfactorily		I can use it well		I can use it very well	
	N	%	N	%	N	%	N	%	N	%
Word processing(eg Word)	50	47.6	34	32.4	11	10.5	3	2.9	6	5.7
Databases (eg Access)	67	63.8	23	21.9	7	6.7	4	3.8	3	2.9
Spreadsheets (eg Excel)	65	61.9	19	18.1	9	8.6	6	5.7	5	4.8
Presentation software (eg PowerPoint)	69	65.7	19	18.1	4	3.8	7	6.7	4	3.8
Publishing software (eg Publisher)	81	77.1	11	10.5	5	4.8	5	4.8	2	1.9

N = number of respondents

As seen from Table 13, 50 (47.6%) of the respondents cannot use MS Word which is the most common- use application software. Three (2.9%)

reported that they can use it well, while 6(5.7%) said they can use it very well. 67 (63.8%) respondents reported that they cannot use MS Access while 4(3.8%) said they can use it well and 3 (2.9%) of the respondents also reported that they can use it very well. Table 13 also shows that 65 (61.9%) respondents cannot use Spreadsheets only 5 (4.8%) can use Spreadsheets very well.

The majority of respondents 69 (65.7%) cannot use Presentation software like MS PowerPoint. However, 7 (6.7%) said they can use it well and 4 (3.8%) reported that they can use it very well. Publishing software like MS Publisher fared badly among all the applications software in the measurement of teachers knowledge in software applications. According to Table 13, 81 (77.1%) said they cannot use Publishing software at all. 5 (4.8%) said they can use it while 2 (1.9%) said they can use it very well.

The general conclusion that can be drawn from the analysis of Research Question 1 is that more than half of the respondents 67 (65%) are not computer users. Also, 75% of the female respondents reported that they don't enjoy using computers. About 41 out of the 73 male respondents representing 56.2% reported that they are computer literates while a greater majority of the women; 24 representing 85.7% of the female respondents, reported that they are not computer literate. Respondents' lack knowledge in using 'common-use' computers application software like MS Word, Excel, Publishing, and PowerPoint.

The result seems to emphasise what Carlson and Gadio (2002) said, that teaching is becoming one of the most challenging professions in our society

where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time. Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching. These challenges ask teachers to continuously retrain themselves and acquire new knowledge and skills while maintaining their jobs.

The result also shows that there is a disparity among male and female teachers concerning their level of computer literacy in the district. Although the result may not provide a conclusive evidence of specific gender disparity, it supports Broos (2005), findings that gender disparity in the use of IT for educational purposes existed to a certain extent. This is definitely a cause for concern as IT is considered a crucial tool for effective teaching and learning in most curricula.

Research Question 2: What are teachers attitude towards the use of computers in basic education schools in Jomoro District?

This question seeks to investigate the impact of teachers' attitude on their actual computer usage. Part Three on the survey sort respondents' attitudes towards computers. The 'anxiety' factor measured teachers' comfort level in using the computer. Items 1- 6 of the Part three of the survey measure this attitude. The result is however summarized in Table 14.

Table 14

Respondents' Anxiety About Computers.

Computer Anxiety	Completely Disagree		Disagree		Neutral		Agree		Completely Agree	
	N	%	N	%	N	%	N	%	N	%
Comfortable with computer	5	4.8	10	9.5	3	2.9	50	47.6	35	33.3
Computers stress me out	20	19	42	40	14	13.3	23	21.9	3	2.9
Ability to fix a computer problem	18	17.1	22	21	8	7.6	34	32.4	21	20
Skeptical with the use of computers	17	16.2	20	19	16	15.2	29	27.6	10	9.5
Computer excites me	14	13.3	7	6.7	4	3.8	45	42.9	32	30.5
Computers scares me	43	41	34	32.4	8	7.6	8	7.6	9	8.6

N = Number of respondents

As seen from Table 14, majority of the respondents 50 (47.6%) agree that they feel comfortable with the idea of the computer as a tool in teaching and learning. 35 (33.3%) strongly agreed that they are comfortable with computers. 42(40%) disagreed with statement 3 which is 'the use of computers in teaching and learning stress me out. While 34 (32.4%) agreed to statement 3 on the survey, 21(20%) strongly agreed to the same statement 3 which is 'If something goes wrong I will not know how to fix it'. About 29 (27.6%) respondents agreed to the statement, 'The idea of using a computer in teaching and learning makes

me skeptical'. 12(11.4%) respondents did not answer this question. However, 17 (16.2%) completely disagree with the statement that they are skeptical with the use of computers. 45(42.9%) respondents agreed to statement 5 which is, 'The use of the computer as a learning tool excites me' In the case of statement 6 however, the majority, 43 (41%) completely disagreed with the statement which is 'The use of computers in teaching and learning scares me'.

In other to answer the research, the items in Table 14 were further analysed by finding their Item Mean Scores. The result is presented in Table 15.

Table 15

Descriptive Statistics of Computer Confidence of Teachers

Items	N	Mean	Skewness	
		Statistic	Statistic	Std. Error
Comfortable with computer	103	3.97	-1.302	.238
Computers stress me out	102	2.48	.425	.239
Ability to fix a problem	103	3.17	-.253	.238
Skeptical with computers	92	2.95	-.107	.251
Computer excites me	102	3.73	-1.057	.239
Computers scares me	102	2.08	1.146	.239

N = Number of respondents

The Items Mean Score (3.97) which is negatively skewed (-1.302) in Table 15, show that teachers feel comfortable with using computer as a learning tool in the classroom. The findings also show that using computers in teaching do not stress them out. This is shown with a mean score of 2.48 in Table 15.

The findings also shows that teachers said they can fix computer problems when

the need arises and also they don't feel any skeptical about computers but are rather excited when using computers. These are shown in Table 15 with mean score 3.17, 2.95 and 3.73 respectively.

Teachers' beliefs about the value of computers in teaching and learning were also analysed. Items 7- 15 of Part three of the survey measure this attitude. The result is presented in Table 16.

Table 16

Distribution of Teachers' Belief about Computers in Teaching and Learning

Value of Computers	Completely Disagree		Disagree		Neutral		Agree		Completely Agree	
	N	%	N	%	N	%	N	%	N	%
Computer is a valuable tool	5	4.9	4	3.9	2	2.0	47	46.1	44	43.1
Computer will change the way I teach	17	16.8	10	9.9	3	3.0	48	47.5	23	22.8
Computer will change the way students learn	20	19.4	14	13.6	3	2.9	39	37.9	27	26.2
I can do what the computer can do	38	36.9	30	29.1	9	8.7	13	12.6	13	12.6
Computer is not conducive to students learning	30	29.7	37	36.6	10	9.9	15	14.9	9	8.9
Computer helps students understand concepts	12	11.9	6	5.9	2	2.0	60	59.4	21	20.8
Computer helps students express their thinking	11	10.7	11	10.7	6	5.8	48	46.6	27	26.2
Computer helps teachers to teach effectively	14	13.6	7	6.8	8	7.8	54	52.4	20	19.4
Computer is not conducive to teaching	30	29.1	38	36.9	8	7.8	19	18.4	8	7.8

Forty-seven (46.1%) agreed to statement 1 (The computer is a valuable tool for teachers). An equally number of respondents, 44(43.1%) strongly agreed with the same statement. 48(47.5%) agreed with statement 2 which is 'the computer will change the way I teach'. 39 (37.9%) agreed that the computer will change the way students learn in their class. 27(26.2%) also strongly agreed with the same statement. 38 (36.9%) completely disagreed with the statement 4 (I can do what the computer can do equally well). With regard to statement 5(The computer is not conducive to students learning because it is not easy to use), 30 (29.7%) strongly disagreed with statement 5 while 37(36.6%) disagreed with the same statement.

In the case of statement 6 (The computer helps students understand concepts in more effective ways) however, the majority 60 (59.4%) of the respondents agreed with the statement. In the same vain, 48 (46.6%) agreed with statement 7 which is 'The computer helps students learn because it allows them to express their thinking in better and different ways'. 27(26.2%) strongly agreed with the same statement.

With regard to the statement 'The computer helps teachers to teach in more effective ways', the majority 54(52.4%) agreed with the statement. Thirty eight (36.9%) disagreed with statement 9 which is 'The computer is not conducive to good teaching because it creates technical problems'. Almost the same number of respondents 30 (29.1%) strongly disagreed. The findings therefore is that majority of the respondents believe that the computer is a valuable tool for teachers and learners in the teaching and learning process.

In conclusion, the findings showed that, teachers' feel comfortable with using computer as a learning tool in the classroom. The findings also show that using computers in teaching do not stress them out neither are they skeptical about computers but rather, they are excited when using computer. The findings also revealed that teachers generally believe that the computer is a valuable tool for teachers and the computer can change the way they teach. The findings further revealed that teachers generally agree that computers help students understand concepts in more effective ways.

The result supports Veen (1993) findings that the effective implementation of ICT depends upon users' having a positive attitude towards it. He showed that schools can go only so far to encourage ICT use, and that actual take-up depends largely on teachers' personal feelings, skills, and attitudes towards ICT. This implies that teachers who have positive attitudes toward ICT and perceive it to be useful in promoting learning will evidently integrate ICT in their classroom more easily than others.

Research question 3: Do gender, major subject area, years of teaching, and school status differences affect teachers' level of literacy in computer technologies?

Respondents were asked to examine the list in the questionnaire (Part Four Page 5) and select three items they considered most essential for teaching and learning in the classroom and describe the value of each item they selected for teaching and learning. The list contained 19 items. Items included miscellaneous hardware from Hard disk to Modem. The results are presented in Table 17.

Table 17

Most Hardware Considered Essential for Teaching and Learning in the Classroom

Items	Choice	
	Frequency	Percent
Hard disk	27	25.7
RAM	6	5.7
CD-ROM	2	1.9
CD (Compact disc)	14	13.3
DVD	8	7.6
Floppy Disk	15	14.3
Keyboard	81	77.1
Mouse	66	62.9
Monitor	68	64.8
Printer	18	17.1
Scanner	2	1.9
TV /Radio Card	1	1
Digital camera	1	1
Joystick	2	1.9
Overhead projector	2	1.9
Modem	1	1

Sixty six (62.9%) respondents had no idea and described nothing; only 39 (37.1%) respondents were able to describe the items that they selected. This could be due to the fact that majority of them are not computer literate.(Findings of research question 1).As seen in Table 17, Hard disk, CD (Compact disc), Floppy Disk, Mouse, Monitor, and Printer received the highest

ranking (10% and above) as essential items for teaching and learning in the classroom, while CD ROM, Scanner, TV /Radio Card, Digital camera, Joystick, Overhead projector, and Modem were the lowest ranked (2% and below) items from the list.

Respondents were asked to mark list of items on the second part of Part Four of the survey as either familiar or unfamiliar. Respondents reported their familiarity with different types of Information and Communication technologies. The results are summarized in Table 18.

Table 18

Teachers' Literacy Level of Computer Technology

Items	Familiar		Unfamiliar		Total
	N	%	N	%	%
Hard disk	68	66	35	34	100
RAM	44	43.1	58	56.9	100
CD-ROM	59	57.8	43	42.2	100
CD (Compact disc)	92	89.3	11	10.7	100
DVD	90	88.2	12	11.8	100
Floppy Disk	61	59.8	41	40.2	100
Keyboard	99	95.2	5	4.8	100
Mouse	96	92.3	8	7.7	100
Monitor	92	89.3	11	10.7	100
Printer	91	88.3	12	11.7	100
Scanner	64	62.1	39	37.9	100
TV /Radio Card	53	52	49	48	100
Digital camera	77	75.5	25	24.5	100
Joystick	28	27.2	75	72.8	100
Overhead projector	28	27.2	75	72.8	100
Modem	26	25.5	76	74.5	100

N = number of respondents

The respondents' as a whole seemed generally familiar with Information and Communication Technologies (ICTs). The frequency distribution showed that 62% of total teachers were familiar with Information and Communication Technologies, while 38% of teachers were Unfamiliar. The result showed that

CD (Compact Disc), DVD, Keyboard, Mouse, Monitor and Printer were the most familiar hardware.

A series of chi-square test were conducted to determine whether there were significant differences in teachers' familiarity with Information and Communication Technologies. The results are presented in Table 19.

Table 19

Differences in Teachers' Literacy Level of Computer Technology

Items	N	Gender. X^2 (df = 1)	Majoring area X^2 (df = 12)	Teaching Experience X^2 (df = 3)	Sch. Status X^2 (df = 1)
Hard disk	103	12.70 **	13.03	4.77	0.44
RAM	102	8.04**	16.53	2.81	0.01
CD-ROM	102	15.60 **	15.78	3.30	0.98
CD (Compact disc)	103	0.00	7.20	4.06	1.15
DVD	102	0.19	10.20	4.86	0.04
Floppy Disk	102	0.90	7.74	9.97*	1.55
Keyboard	104	0.42	7.77	1.22	0.95
Mouse	104	0.44	7.20	2.21	0.42
Monitor	103	4.43*	10.31	3.45	1.15
Printer	103	0.05	7.77	1.95	1.21
Scanner	103	0.45	12.25	2.01	0.37
Sound card	103	6.45**	17.27	5.32	0.32
TV /Radio Card	102	0.33	13.27	3.04	0.00
Digital camera	102	0.42	4.45	1.36	0.69
Joystick	103	5.08*	19.30	5.88	1.13
Overhead projector	103	1.88	5.21	0.62	4.66*
Modem	102	0.00	21.50*	5.03	0.32

(*p < 0.05 ** p<0.01)

Table 19 shows that significant differences were found to exist between males and females in their familiarity with some types of ICTs. More male teachers

than female teachers were familiar with Hard disk, RAM, CD-ROM, Monitor, Sound Card, and Joystick.

A possible explanation for this is that most people in Ghana view Information and Communication Technologies as male domains. The results of the chi-square analysis for teachers and their Major subject area revealed that teachers didn't significantly differ in their familiarity with ICTs.

According to Table 19, the amount of teaching experience appeared to have no effect on teachers' familiarity with ICTs. This is not a surprise since majority of the respondents reported that they don't have computers and also they are not computer users. The results of the chi-square analysis for school status revealed that the two groups of schools did not differ significantly in their familiarity with ICTs. Teachers who teach in Public schools did not differ significantly in their familiarity with ICTs than Private school teachers.

In conclusion, the respondents' as a whole seemed generally familiar with Information and Communication Technologies (ICTs). The frequency distribution showed that 62% of total teachers were familiar with Information and Communication Technologies, while only 38% of teachers were Unfamiliar with ICTs. The analysis also showed that significant differences were found to exist between males and females in their familiarity with some types of ICTs. More male teachers than female teachers were familiar with Hard disk, RAM, CD-ROM, Monitor, Sound Card, and Joystick. The results of the chi-square analysis for teachers and their Major subject area revealed that teachers didn't significantly differ in their familiarity with ICTs. The result showed that the

amount of teaching experience appeared to have no effect on teachers' familiarity with ICTs. The chi-square analysis for school status revealed that the two groups of schools did not differ significantly in their familiarity with ICTs. Teachers who teach in Public schools did not differ significantly in their familiarity with ICTs than Private school teachers.

In order to draw a good conclusion on research question 5, a further statistical analysis has been done in the next section of this study.

Hypothesis 1

It was hypothesised that:

Ho: There is no statistically significant difference between male and female teachers' level of literacy in computer technologies.

An independent-sample t-test was used to analyse and test hypotheses 1 and 2. It helped to determine the level of difference, if any, between male and female respondents' literacy level in computers technologies. The result of the independent-sample t-test is shown in Table 20.

Table 20

Comparison of Male and Female Respondents on Their Literacy Level in Computers Technologies

Variable	M	SD	t	df	p
Male	1.51	0.50	-2.62	103	0.010*
Female	1.30	0.46			

(* $p<0.05$)

Inspection of the two group means indicated that the mean scores in familiarity with ICTs for female respondents (1.30) is significantly lower than the mean score (1.51) for males as seen in Table 20. There was therefore a significant difference between males and females in their familiarity with computers; $t(103) = -2.62$, $p = 0.01$. The magnitude of the difference in the means was very small (eta squared = 0.006). This result confirms the chi-square findings in research question 3 that, significant differences were found to exist between males and females in their familiarity with some types of ICTs. More male teachers than female teachers were familiar with Hard disk, RAM, CD-ROM, Monitor, Sound Card, and Joystick.

Specifically, the significant difference was recorded in only 5 out of the 19 hardware items. The result of items which showed the differences in their familiarity with ICTs is shown in Table 21.

Table 21

Comparison of Male and Female Respondents on Their Familiarity with ICT Hardware Which had the Highest Selection.

Items	M	SD	t	df	p
Hard disk					
Male	1.23	.426	-3.77	99	0.01*
Female	1.61	.497			
RAM					
Male	1.47	.503	-2.93	98	0.00*
Female	1.79	.418			
Monitor					
Male	1.07	.254	-2.13	99	0.00*
Female	1.21	.418			
Sound card					
Male	1.55	.501	-2.90	99	0.00*
Female	1.82	.390			
Joystick					
Male	73	1.67	-2.29	99	0.00*
Female	28	1.89			

(* $p<0.05$)

As seen from Table 21, more males respondents were more familiar with Hard disk $t(99) = -3.77$, $p = 0.01$, RAM $t(98) = -2.93$, $p = 0.00$, Monitor $t(99) = -2.62$, $p = 0.00$, Sound Card $t(99) = -2.90$, $p = 0.00$ and Joystick $t(99) = -2.29$, $p = 0.00$ than females respondents.

Hence the study failed to accept the null hypotheses that 'There is no

statistically significant difference between male and female teachers' level of literacy in computer technologies'

Hypothesis 2.

Ho: There is no statistically significant difference between public and private school teachers' level of literacy in computer technologies

To test hypotheses 2, again an independent samples t-test was conducted to compare the means of public and private schools familiarity with ICTs. Table 22 shows the results of the independent sample t-test on the 19 items between public and private schools respondents.

Table 22

Comparison of Public and Private Schools Respondents on Their Familiarity with ICTs

	Public		Private			
Variable	M	SD	M	SD	t	p
Hard disk	1.31	.467	1.38	.490	-.66	.51
RAM	1.57	.500	1.58	.501	-.08	.94
CD-ROM	1.46	.502	1.36	.486	.98	.34
CD (Compact disc)	1.08	.277	1.15	.362	-1.07	.29
DVD	1.11	.321	1.13	.339	-.20	.84
Floppy Disk	1.46	.502	1.33	.478	1.24	.22
Keyboard	1.03	.178	1.08	.267	-.97	.33
Mouse	1.06	.248	1.10	.304	-.65	.52
Monitor	1.08	.277	1.15	.362	-1.07	.29
Printer	1.15	.358	1.08	.267	1.10	.28
Scanner	1.41	.496	1.35	.483	.60	.55
TV /Radio Card	1.49	.504	1.49	.506	.06	.97
Digital camera	1.28	.452	1.21	.409	.82	.41
Joystick	1.77	.424	1.68	.474	1.06	.29
Overhead projector	1.66	.479	1.85	.362	-2.19	.06
Modem	1.80	.403	1.70	.464	1.14	.26

Results of the analysis in Table 22 shows that differences in all the 19 items tested under familiarity with computers between public and private schools were not statistically significant. From Hard disk through to Modem, none of them showed any statistically significant difference in their test scores. They all showed

a p value greater than 0.5.

By the results of the analysis, the study accepts the null hypothesis that there is no statistically significant difference between public and private school teachers' level of literacy in computer technologies

Hypothesis 3.

Ho: There is no statistically significant relationship between teachers' major subject area and their level of literacy in computer technologies

The relationship between respondents' subject area of specialisation and their familiarity with computers was investigated using the standard multiple regression (simultaneous) approach. The ICTs selected for the regression analysis was based on the most selected hardware (items that received 15% selection and above, see Table 17) for classroom teaching. These ICTs included Hard disc, Monitor, Mouse, Keyboard and Printer. The researcher checked to see if the data met the assumptions of multiple linear regressions. The tests for normality, homoscedasticity, and multicollinearity all resulted in normal outcomes.

The means, standard deviations, and intercorrelations of the analysis can be found in Table 23.

Table 23

Means, Standard Deviation, and Intercorrelation for Major Subject Area and Predictors Variables (N = 88)

Variable	M	SD	Intercorrelations				
			Hard disk	Monitor	Mouse	Keyboard	Printer
Hard disk	1.35	.48	--	.46	.40	.30	.26
Monitor	1.10	.31	.46	--	.73	.65	.23
Mouse	1.08	.27	.40	.73	--	.74	.42
Keyboard	1.05	.21	.30	.65	.74	--	.27
Printer	1.11	.32	.26	.23	.42	.27	--

Correlation is significant at the 0.05 level (2-tailed).

Table 23 shows that only mouse correlated positively (low) with subject area of specialization (r = .07), though not statistically significant. The rest of the predictors showed negative correlation with subject area of specialization, yet they are also statistically not significant. Table 23 also shows that the predictive variables are not significantly correlated with each other. Therefore it can be concluded from Table 23 that the predictive variables (Hard disk, Monitor, Mouse, Keyboard, and Printer) are not statistically significantly correlated with subject area of specialisation which is the dependent variable for familiarity with computers; $F(5, 82) = 1.08$, $p > 0.05$. From the analysis, $F = 1.08$ and is not statistically significant ($p = 0.38$).This indicates that the combination of all the predictors (Hard disk, Monitor, Mouse, Keyboard, and Printer) on subject area of specialization do not significantly correlate with respondents' familiarity with computer technologies.

The standard multiple regression analysis was conducted to determine the amount of variance in respondents' subject area of specialization in relation with familiarity with ICTs that can be explained by the variables in this study. The beta coefficients are presented in Table 24.

Table 24

Simultaneous Multiple Regression Analysis Summary for Hard disk, Monitor, Mouse, Keyboard, and Printer predicting Familiarity with ICTs (N = 88)

Variable	b	SEb	β	t	sig
Constant	38.82	19.82		1.96	.06
Hard disk	2.16	8.30	.032	.26	.80
Monitor	-30.89	18.09	-.29	-1.71	.09
Mouse	45.04	23.55	.38	1.91	.06
Keyboard	-26.89	25.53	-.17	-1.05	.30
Printer	-10.12	12.29	-.10	-.82	.41

Note: $R^2 = .01$; $F(5, 82) = 1.08$, $p > 0.5$

All the predictors had p values greater than 0.05 which is the error margin allowed in the test (0.005 alpha level). This is an indication that, none of the predictors contribute significantly to the prediction of respondents subject areas in relation with familiarity with ICTs. The adjusted R squared value was 0.005. This indicates that only 0.5% of the variance in subject area of specialization on familiarity with computers can be predicted from the combination of Hard disk, Monitor, Mouse, Keyboard, and Printer. It also shows that only 0.5% of the variance in subject area of specialization on familiarity with computers

technologies was explained by the model. According to Cohen (1998) this is a very small effect.

Since the t-statistic (1.08) is not statistically significant (p=0.38), the null hypothesis which states that there is no statistically significant relationship between teachers' major subject area and their level of literacy in computer technologies is accepted.

Hypothesis 4.

Ho: There is no statistically significant relationship between teachers' years of teaching and their level of literacy in computer technologies

To test hypothesis 4, standard multiple regression was again used in the analysis of the responses. Also, the ICTs used for the regression analysis was based on the most selected hardware used in hypothesis 3. These ICTs included Hard disc, Monitor, Mouse, Keyboard and Printer. The researcher checked to see if the data met the assumptions of multiple linear regressions. The tests for normality, homoscedasticity, and multicollinearity all resulted in normal outcomes. The means, standard deviations, and intercorrelations of the analysis can be found in Table 25.

Table 25

Means, Standard Deviation, and Intercorrelation for Years of Teaching and Predictors Variables (N = 97)

Variable	M	SD	Intercorrelations				
			Hard disk	Monitor	Mouse	Keyboard	Printer
Hard disk	1.33	.47	--	.41	.40	.30	.30
Monitor	1.10	.31	.411	--	.69	.61	.20
Mouse	1.07	.26	.40	.69	--	.74	.40
Keyboard	1.04	.20	.29	.61	.74	--	.25
Printer	1.11	.32	.30	.20	.40	.25	--

Correlation is significant at the 0.05 level (2-tailed).

Table 25 shows that hard disk and monitor correlated positively (low) with years of teaching experience (r = .18 and .06 respectively), though not statistically significant. The rest of the predictors; keyboard and printer, showed negative correlation with years of teaching experience, yet they are also statistically not significant.

Table 25 shows that the predictive variables (Hard disk, Monitor, Mouse, Keyboard, and Printer) are not statistically significantly correlated with years of teaching experience which is the dependent variable for familiarity with computers. Table 25 also shows that none of the predictive variables are significantly correlated with each other. When the combination of all the predictors (Hard disk, Monitor, Mouse, Keyboard, and Printer) were entered into the model simultaneously to predict whether the respondents' years of teaching

experience correlate with their familiarity with ICTs, it showed no statistically significant correlation, $F(5, 91) = 2.28$, $p > 0.05$. From the analysis, $F = 2.28$ and is not statistically significant ($p = .06$). This indicates that the combination of all the predictors (Hard disk, Monitor, Mouse, Keyboard, and Printer) on years of teaching do not significantly influence respondents' familiarity with computer technologies. The standard multiple regression analysis was conducted to determine the amount of variance in respondents' years of teaching in relation with familiarity with ICTs that can be explained by the variables in this study. Table 26 shows the beta coefficients of the analysis.

Table 26

Multiple Regression Analysis Summary for Hard disk, Monitor, Mouse, Keyboard, and Printer predicting Familiarity with ICTs (N = 97)

Variable	b	SEb	β	t	sig
Constant	1.63	.45		3.66	.00
Hard disk	.40	.18	.25	2.20	.030
Monitor	.57	.36	.23	1.56	.12
Mouse	-.95	.52	-.32	-1.82	.07
Keyboard	-.22	.58	-.06	-.37	.71
Printer	-.16	.27	-.06	-.58	.56

Note: $R^2 = .062$; $F(5, 91) = 2.28$, $p > 0.5$

The predictors had p values greater than 0.05 which is the significant value allowed in the test. This is an indication that, none of the predictors contributes significantly to the prediction of respondents years of teaching experience on familiarity with ICTs. The adjusted R squared value was .062.

This indicates that only 6.2% of the variance in years of teaching experience on familiarity with computer technologies was explained by the model. According to Cohen (1998) this is a very small to medium effect.

Since the t-statistic (2.28) is not statistically significant (p= 0.06), the null hypothesis which states that there is no statistically significant relationship between teachers' years of teaching and their level of literacy in computer technologies is accepted.

Discussion of Results

The study showed that 65 (64.4%) of the respondents reported that they are not computer literate. Only 4 (14.3%)out of the 28 female respondents, reported that they are computer literate. A majority of the women; 24(85.7%) of the female respondents, reported that they are not computer literate. It also shows that, 32 (43.8%) out of the 73 male respondents reported that they are computer literates. A greater majority of the male respondents 41(40.6%) however reported that they are not computer literates. This study therefore, revealed that many teachers are not computer users and the computer literacy level of teachers is very low. It also came out that teachers' in basic educational schools in Ghana lack fundamental concepts, knowledge and skills for applying technology in educational settings.

This result also suggests that there is a disparity among male and female teachers concerning their level of computer literacy in the district. Although the result may not provide a conclusive evidence of specific gender disparity, Broos (2005), indicated that gender disparity in the use of IT for educational purposes

existed to a certain extent. This is definitely a cause for concern as IT is considered a crucial tool for effective teaching and learning in most curricula. Chen (1985) on the other hand found that females and males responded with similar levels of interest toward computers when they possessed similar amounts of computer experience. A lack of technical and theoretical knowledge is a barrier to the use of Computer-assisted Learning technology. Shashaani, (1997), Kirkpatrick and Cuban (1998) noted that the gender gap can be narrowed when both genders are exposed to the same amounts and types of experiences when using computers

Another area of concern of this study was teachers' attitude towards computers at the basic education schools in Jomoro District?

Unfortunately, research evidence (Cuban, 2000; Bosch & Cardinale, 1993) indicates that technology reform efforts have failed because teachers' beliefs, skills, and attitudes were never taken into consideration. Teacher behavior, though, is not only a function of their abilities, skills, and attitudes, but also a function of their surrounding work environment.

The result of the study shows that majority of the teachers 50 (47.6%) agreed that they feel comfortable with the idea of the computer as a tool in teaching and learning and they do not feel any skeptical about computers but are rather excited when using computers. The findings also showed that using computers in teaching do not stress them out. The result, therefore, agrees with Veen (1993) findings that the effective implementation of ICT depends upon users' having a positive attitude towards it. He showed that schools can go only so far to encourage ICT use, and that actual take-up depends largely on teachers'

personal feelings, skills, and attitudes towards ICT. This implies that teachers who have positive attitudes toward ICT and perceive it to be useful in promoting learning will evidently integrate ICT in their classroom more easily than others.

The study also revealed that there is no statistically significant relationship between respondents' years of teaching and their familiarity with computer technologies. There is also no statistically significant relationship between respondents' majoring subject area and their familiarity with computer technologies

The results of the analysis for school status revealed that the two groups of schools did not differ significantly in their familiarity with ICTs. Teachers who teach in Public schools did not differ significantly in their familiarity with ICTs than Private school teachers. This is not a surprise since majority of the respondents reported that they do not have computers and also they are not computer users. The respondents' as a whole seemed generally familiar with Information and Communication Technologies (ICTs). The frequency distribution showed that 62% of total teachers were familiar with Information and Communication Technologies.

However, this study showed that significant differences were found to exist between males and females in their familiarity with some types of ICTs.

There is statistically significant difference between male and female respondents' familiarity with computer technologies. More male teachers than female teachers were familiar with Hard disk, RAM, CD-ROM, Monitor, Sound Card, and Joystick. This seems not to be a surprise as this is consistent with earlier studies.

Shashaani & Khalili, (2001) and a recent study by Broos (2005) also found significant gender differences - favouring males in terms of attitudes toward new communications technology, the extent of computer use and self-perceived computer experience. Even when females perceived themselves as being more competent in using computers, they expressed higher computer anxiety levels compared to males. Liaw (2002), had also indicated that males had more positive perceptions towards computers and Web technologies than females.

Summary of Findings

Chapter 4 provided a detailed analysis of the research data. This chapter provided answers to five research questions and four hypotheses formulated for the study. The study found that, respondents' lack knowledge in using 'common-use' computers application software like MS Word, Excel, Publishing, and PowerPoint.

. Another findings of the research was that teachers' feel comfortable with using computer as a learning tool in the classroom. The findings also show that using computers in teaching do not stress them out neither are they skeptical about computers but rather, they are excited when using computer. The findings also revealed that teachers generally believe that the computer is a valuable tool for teachers and the computer can change the way they teach. The findings further revealed that teachers generally agree that computers help students understand concepts in more effective ways.

Another finding of the study was that significant differences were found to exist between males and females in their familiarity with some types of ICTs.

More male teachers than female teachers were familiar with Hard disk, RAM, CD-ROM, Monitor, Sound Card, and Joystick.

The study also showed that teachers major subject area, and the amount of teaching experience had no effect on teachers' familiarity with ICTs.

Finally, the study also found that teachers who teach in Public schools did not differ significantly in their familiarity with ICTs than Private school teach

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the research process, finding and recommendations. In addition, the chapter offers suggestions for further research.

Summary of Research Process

The purpose of this study was to investigate the basic school teachers' level of computer literacy and attitude to the use of computers in Jomoro district.

The following research questions were formulated to guide the study:

1. What is the level of computer literacy among basic school teachers in Jomoro District?
2. What are teachers attitude towards the use of computers in basic education schools in Jomoro District?
3. Do gender, major subject area, years of teaching, and school status differences affect teachers' level of literacy in computer technologies?

In relation to the research questions, the following statistical hypotheses were also formulated and tested:

1. Ho: There is no statistically significant difference between male and female teachers' level of literacy in computer technologies.

2. Ho: There is no statistically significant difference between public and private school teachers' level of literacy in computer technologies
3. Ho: There is no statistically significant relationship between teachers' major subject area and their level of literacy in computer technologies
4. Ho: There is no statistically significant relationship between teachers' years of teaching and their level of literacy in computer technologies.

The sample of the study covered 30 basic schools (20 public schools and 10 private schools) in the Jomoro District. In all 105 teachers participated in the study. Responses from the participants were put into frequencies and analyzed using tables.

Descriptive statistics were adopted for presenting and analysing the data in this study. The researcher summarized patterns in the responses from the sample by the use of frequency tables and percentages. However, inferential statistics (chi-square, an independent-sample t-test and standard multiple regression) was used, where necessary, to determine if the patterns described in the sample can be applied to the population from which the sample is drawn. This formed the basis of the analysis.

Summary of Major Findings

1. The findings of the study showed that majority of the teachers are not computer literates. A greater majority of the respondents reported that they are not computer literates.
2. The result of the study shows that majority of the teachers agreed that they feel comfortable with the idea of the computer

as a tool in teaching and learning and they do not feel any skeptical about computers but are rather excited when using computers.

3. The study also revealed that there is no statistically significant relationship between respondents' years of teaching and their familiarity with computer technologies

4. There is also no statistically significant relationship between respondents' majoring subject area and their familiarity with computer technologies

5. The results of the analysis for school status revealed that the two groups of schools did not differ significantly in their level of computer literacy and attitude to the use of computers

6. However, this study showed that significant differences were found to exist between male and female teachers in their level of computer literacy and attitude to the use of computers. There is statistically significant difference between male and female respondents' familiarity with computer technologies

Conclusion

The challenge confronting our educational systems is how to transform the curriculum and teaching-learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment. ICTs provide an array of powerful tools

that may help in transforming the present isolated, teacher centred and text-bound classrooms into rich, student focused, interactive knowledge environments. To meet these challenges, learning institutions must embrace the new technologies and appropriate ICT tools for learning.

In spite of the challenges that computing poses, its integration into the curricula of schools holds vast potential for their socioeconomic development. The increasing use of computers in industry places a demand on schools to provide opportunities for computer literacy. This in turn places a demand on teacher education to revise its curricula to provide quality teachers equipped for this purpose. As computer use continues to increase in society, educators must also prepare for the use of computers within the classroom. This involves all levels of education, including basic schools.

Recommendations

Considering the findings and conclusions drawn from the study, the following recommendations are made;

1. The Ministry of Education and Ghana Education Service should ensure that the Ghana National ICT in Education Policy is properly instituted and implemented.

2. The Government should implement a comprehensive programme of rapid deployment and utilization of ICT within the Education Sector to transform the education system and thereby improve the lives of our people.

3. More attention should be paid to the initial teacher training programme in Ghana. The training colleges must be well equipped with ICT facilities so that they can train teachers with good knowledge in ICT for our basic schools.

4. There is the need for in-service training in computer technology. Particularly because modern society and information change rapidly, pre-service education is no longer enough for teachers to keep abreast with current trends and maintain high quality of instruction. The effectiveness of teachers is a determinant to educational quality, and in-service training is important to enhance the effectiveness of teachers. Teachers need to receive training which will build their confidence so that they can become capable of dealing with available technology. They need to have continuous training so that they are up-to-date with the latest technologies.

5. The Ministry of Education and Ghana Education Service must purchase sufficient hardware and software for basic education schools. Computers and computer-related technologies should be part of classroom teaching activities in Ghana

Suggestion for Further Research

The current study is limited in scope because it was based only in Jomoro District. Also, only 30 schools were used for the study. To make the findings more representative and generalisable for the whole country, there is the need to

replicate this study among other population groups using larger geographic areas to compare and contrast Jomoro District with other Districts across the country.

A study must also be conducted using teachers from high schools to compare and contrast their responses with basic schools teachers.

Such studies should be conducted using the basic instruments of this study in order to confirm or refute the findings of this work.

REFERENCES

Al-Khaldi, M. A., & Al-Jabri, I. M. (1998). The relationship of attitudes to computer utilization: New evidence from a developing nation. Computers in Human Behavior, 14 (1), 23-42

Amedahe, F. K., & Gyimah E. A. (2002). Introduction to Educational Research. Centre for Continuing Education of the University of Cape Coast. Pg 134

Best, J. W., & Kahn, J. V. (1993). Research in education. Boston: Allyn a Bacon.

Bosch, K. A. & Cardinale, L. (1993). Preservice teachers' perceptions of computer use during a field experience. Journal of Computing in Teacher Education, 10(1), 23 – 27, EJ 492 121

Brock, D., & Sulsky, L. (1994). Attitudes towards computers: Construct validation and relations to computer use. Journal of Organizational Behavior,15,17-35.

Broos, A. (2005). Gender and information and communication technologies (IT)anxiety: male self assurance and female hesitation. Cyber Psychology & Behaviour, 8 (1), 21-31.

Bryman, A. & Cramer, D. (1997). Quantitative data analysis with SPSS for Windows, London and New York: Routledge

Carlson, S., & Gadio, C. T. (2002). Teacher professional development in the use of technology. In W.D. Haddad & A. Draxler (Eds.), Technologies for education: potential, parameters, and prospects, Paris and Washington, D.C.: UNESCO and AED, retrieved April 25, 2005

Chen, M. (1985). Gender and computers: the beneficial effects of experience onattitudes. Paper presented at the 1985 Conference on Computers and Children, Ann Arbor, Michigan.

Cronbach, L. J. (1990) Essentials of Psychological Testing. New York: Harper &Row.

Cuban, L. (2000). So much high-tech money invested, so little use and change in practice: How come? Paper presented for the Council of Chief State School Officers' Annual Technology Leadership Conference, Washington,DC.

Darling-Hammond, L. (1990). Instructional policy into practice: "The power of the bottom over the top." Educational Evaluation and Policy Analysis, 12(3), 233–241.

Davis, F. D.; Bagozzi, R. P.; Warshaw, P. R. (1989). User Acceptance of Computer Technology: A. Comparison of Two Theoretical Models. Management Science. 35, 8, 982-1003

De Vaus, D. 1991 Surveys in Social Research. (3rd ed). London, Unwin

Dupagne, M., & Krendi, K. A. (1992). Teachers' attitudes toward computers: A review of the literature. Journal of Research on Computing in Education, 24(3), 420-429.

Ertmer, P. A., Addison, P., Lane, M., Ross, E., & Woods, D. 1999, Examining teachers' beliefs about the role of technology in the elementary classroom. Journal of Research on Computing in Education, 32(1/2), 54-72.

Fraenkel J. R & Wallen, N. E. (2000) How to design and evaluate research in education. New York: McGraw-Hill.

Fullan, M. D. (1982). The meaning of educational change. New York, NY: Teachers College Press.

Fullan, M. (1991). The new meaning of educational change. Ontario Institute for Studies in Education: New York, N. Y.: Teachers College Press, Teachers
College, Columbia University.

Fullan, M. D. (2000). The three stories of educational reform. Phi Delta Kappan,81(8), 581–584.

Gay, L. R. (1981). Educational Research: competencies for analysis and application. (2nd ed), Columbus: Charles E. Merril publishing Company.

Gay, L. R. & Airasian, P. (2000). Educational Research: competencies for analysis and application. Upper Saddle River, NJ: Prentice-Hall, Inc

Harris, J. B., & Grandgenett, N. (1996). Correlates among teachers' anxieties, demographics, and telecomputing activity. Journal of Research on Computing in Education, 28(3), 300-318.

Hebert, M. and Benbasat, I. (1994) Adopting Information Technology in Hospitals: The Relationship between Attitudes/Expectations and Behavior, Hospital & Health Services Administration, 39, 3, 369-384.

Houtz, L. E., & Gupta, U. G. (2001). Nebraska high school students' computerskills and attitudes. Journal of Research on Computing in Education, 33 (3), 316-326.

Kadijevich, D. (2000). Gender differences in computer attitude among ninth-grade students. Journal of Research on Computing in Education, 22 (2), 145-154.

Kirkpatrick, H., & Cuban, L. (1998). What the research says about gender differences in access, use, attitudes and achievement with computers, Educational Technology, 38, 56-61.

Koohang, A. (1987). A study of the attitudes of pre-service teachers toward the use of computers. Educational Communication and Technology Journal, 35 (3), 145-149.

Koszalka, T. A. (2001). Effect of Computer-Mediated Communications on Teachers' Attitudes Toward Using Web Resources in the Classroom. Journal of Instructional Psychology, 28(2), 95- 103.

Leedy, P. (1993). Practical Research Planning and Design. 5th Ed. New York: Macmillan

Liaw, S. S. (2002). An Internet survey for perceptions of computers and the World Wide Web: relationship, prediction, and difference. Computers in Human Behavior, 18 (1), 17-35.

Lockheed, M. E., & Mandinach, E. B. (1986). Trends in educational computing: Decreasing interest and the changing focus of instruction. Educational Researcher, 15, 21-26.

Mitra, A., Steffensmeier, T., Lenzmeier, S., Avon, R., Qu, N. and Hazen, M. (2000). Gender and Computer Use in an Academic Institution: Report from a Longitudinal Study. Journal of Educational Computing Research, v 23 (1), 67-84.

Murphy, T. H., & Terry, R., Jr. (1998a). Adoption of CALL technologies in education: A national delphi. Proceedings of the Forty-Fourth Annual Southern Agricultural Education Research Meeting, 112-123.

Nevell, R. (1993). Questionnaire. In Gilbert, W. (Ed.) Researching Social Life. London: Sage: 94-115

Polit, D. F & Hungler, B. P (1995). Nursing Research – Principles & Methods (5 th Ed), J. B. Philadelphia, Lippincott Company

Robey, D. (1979. User attitudes and management information system use. Academy of Management Journal, 22 (3), 527-538.

Sandholtz, J. H., Ringstaff, C. & Dwyer, D. C. (1997). Teaching with technology: Creating student-centered classrooms. New York, NY: Teachers College Press.

Sarantakos S. (1998) . Social research. South Yarra: MacMillan Publishers Australia Pty Ltd.

Shahan, K. E. (1976). The administrator's role in developing innovations. Unpublished manuscript, Boston, MA: Harvard Graduate School of Education.

Shashaani, L. (1993). Gender-based differences in attitudes toward computers. Computers and Education, 20(2), 169.181.

Shashaani, L.(1997). Gender differences in computer attitudes and use among college students. Journal of Educational Computing Research, 16 (1), 37-51.

Shashaani, L., & Khalili, A. (2001). Gender and computers: similarities and differences in Iranian college students' attitudes toward computers. Computers & Education, 37 (3-4), 41-51.

Swarts, P. (2006). Global e-Schools and communities Initiatives(GeSCI)

The Ghana ICT for Accelerated Development (ICT4AD) Policy, 2003 p. 37

The Ghana National ICT In Education Policy p. 1 and 13

Todman, J. (2000). Gender differences in computer anxiety among university entrants since 1992. Computers and Education, 34 (1), 27-35.

Tsai, C. C., Lin, S. S. J., & Tsai, M. J. (2001). Developing an Internet attitude scale for high school students. Computers & Education, 37 (1), 41-51.

Veen, W. (1993). The role of beliefs in the use of information technology: implications for teacher education, or teaching the right thing at the right time. Journal of Information Technology for Teacher Education, 2(2), 139–153.

Watt, D. H. (1980). Computer literacy: what should schools be doing about it? Classroom Computer News, 1(2), 1– 26.

Yildirim, S., (2000). Effects of an educational computing course on pre-service and in-service teachers: a discussion and analysis of attitudes and use. Journal of Research on Computing in Education, 32 (4), pp.479-495.

APPENDIX A

Basic Schools in Jomoro District

1. Adusuazo Pry & JHS
2. Ahobre Pry & JHS
3. Allengenzule Pry & JHS
4. Allowule Pry & JHS
5. Almighty Basic Prep
6. Amoakwa/Compond JHS
7. Amokwawsuazo Pry & JHS
8. Anlomatuope Pry & JHS
9. Anwiafutu Junction Pry & JHS
10. Anwiafutu Town Pry & JHS
11. Atwebanso/Edobo Pry & JHS
12. Azuleti Pry
13. Believer Basic Int.
14. Bemant Pry & JHS
15. Beyin Pry & JHS
16. Bonyere Cath Pry & JHS
17. Banyere Meth. Pry & JHS
18. Christ the King Basic
19. Christian Academy Basic
20. Coco Town Pry & HIS
21. Compond D/C sch

22. Andoh Memorial Prep

23. Ebenezer Prep Sch.

24. Ebonloa Pry & JHS

25. Effasu Pry & JHS

26. Egbazo Pry & HIS

27. Ehoaka Pry & JHS

28. Ekpu Cath. Pry & JHS

29. Ellenda Pry & JHS

30. Ellloyin SDA Basic Sch

31. Elubo Pry & JHS

32. Elubo New Generation Basic

33. Half Assini Cath Pry & JHS

34. Half Assini Meth Pry & JHS

35. Jaway Pry & JHS

36. Jaway Wharf Pry & JHS

37. Jaway Wharf Pentecost Basic

38. Jaway Wharf Islamic Pry

39. Kengen Pry & JHS

40. MAN'S Pry & JHS

41. Mangyea Pry & JHS

42. Mochia Academy Prep Sch

43. Mpataba Pry & JHS

44. Mpeasem Cath Pry

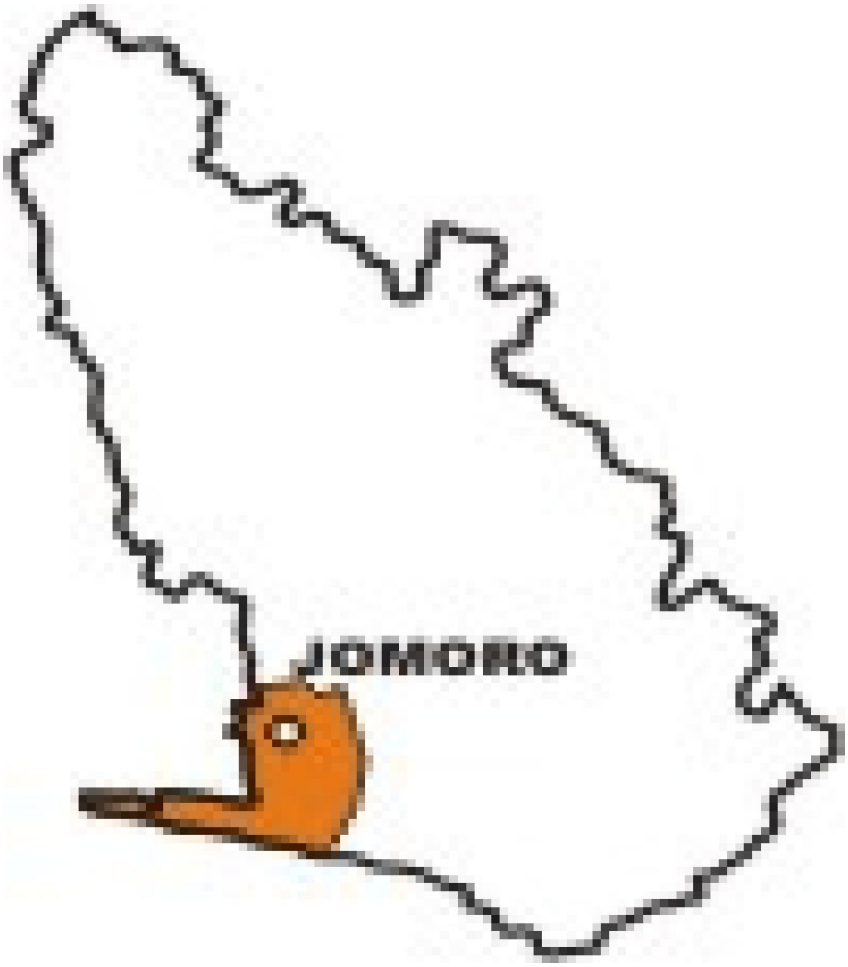
45. Mpim Pry

46. Nana Ayebie-Amihere Pry & JHS
47. Nana Nda Blay JHS
48. Nashrudin Islamic Pry
49. Navrogo/Tweako Pry
50. Nawule Pry & JHS
51. New Ankasa D/C Pry
52. New Ankasa Pry
53. New Gen. Complex Basic
54. New Kabenlasuazo Pry & JHS
55. New Town Pry & JHS
56. New Town Salvation Pry
57. Nzimaman Complex basic Sch
58. Nuba Annor-Agyei Prep
59. Nuba D/A JHS
60. Nungua R/C Basic School
61. Nzimitianu Prep. Pry.
62. Nzulezo Pry
63. Peace International Prep
64. Prophet Nkansah D/C Pry
65. Psalms Basic Sch
66. Sakito Prep School
67. Salvation International Prep Basic School Mpataba
68. Samenye Pry & JHS
69. Samenye Adventist Prep School

70. Takinta Pry & JHS
71. Tikobo 1 Pry & JHS
72. Tikobo 2 Anglican Pry
73. Tikobo 2 Cath. Pry
74. Tikobo 2 DC JHS
75. Twenen Pry & JHS
76. Western International Basic
77. What a Man Academic
78. Domiabra Pry
79. Sowotuom
80. MT Zion Prep Sch
81. Sowodadem
82. Green Leaf International Ndumsuazo

APPENDIX B

The map of western region showing the location of Jomoro district.



APPENDIX C

Introductory letter from Jomoro Education Office

GHANA EDUCATION SERVICE

JOMORO DISTRICT

Telephone
Office: 233 (0) 31 94530
Residence: 233 (0) 31 94531

REPUBLIC OF GHANA

District Education Office
P. O. Box 24
Half Assini

My Ref No. HADO. 50/Vol.i/456
Your Ref No:.....

4th March, 2009.

TO WHOM IT MAY CONCERN

ACADEMIC RESEACH
RE: ELISHA D'ARCHIMEDES ARMAH

The above-named student from the University of Cape Cost is soliciting your assistance for collection of some information for his final programme.

Please give him your maximum support.

Thank you

J. J. KWAW
A/D (HRMD)
For: DISTRICT DIRECTOR

APPENDIX D

QUESTIONNAIRE

This questionnaire is meant to collect data that will help to empirically ascertain the level of information and communication technology (ICT) awareness by basic school teachers in the Jomoro district of the western region of Ghana. In this questionnaire, quite few questions require you to fill some information, while the rest of the questions require you to either tick(v) items or circle a response that apply to your situation. I wish to let you know that all the information you provide will be used only for the purpose of this data and that it will be treated confidentially.

PART ONE: DEMOGRAPHIC INFORMATION

Please circle, tick or write your answer in the space provided

1.Age: …….

2. Gender: ☐ male ☐ female

3. Subject area of specialization :
……

4. School Status of School: ☐ public ☐ private

5. The level you teach(circle your answer): Lower Primary 1 2 3

Upper primary 4 5 6

JHS 1 2 3

6. Years of teaching experience: …….

7. Does your school have computers? ☐ yes ☐
no

8. How many years ago were computers introduced for the first time in your school (if any)? .....

9. How many computers are there in your classroom? …….

10. Does your school have sufficient computer resources? ☐ yes ☐ no

11. Do you have a home computer ? ☐ yes ☐ no

12. Do you read computer and Internet magazines? ☐ yes ☐ no

13. Do you visit computer stores and exhibitions? ☐ yes ☐ no

14. Are you a computer user? ☐ yes ☐ no

15. Do you enjoy using the computer? ☐ yes ☐ no

16. Do you think that you are computer literate? ☐ yes ☐ no

17. Do you have access to the Internet? ☐ yes ☐ no

18. Are you an Internet user? ☐ yes ☐ no

19. Have you participated in professional development courses related to the integration of computers in teaching and learning?

☐ Yes ☐ no

PART TWO: KNOWLEDGE OF COMPUTER SOFTWARE

Please circle your answer

		I cannot use it	I can use it to a small extent	I can use it satisfactorily	I can use it well	I can use it very well
1	. Word processing (e.g., Word)	1	2	3	4	5
2	Databases (e.g., Access)	1	2	3	4	5
3	Spreadsheets (e.g., Excel)	1	2	3	4	5
4	Graphics (e.g., Paint, Photoshop)	1	2	3	4	5
5	Multimedia authoring software (e.g., HyperStudio)	1	2	3	4	5
6	Presentation software (e.g., PowerPoint	1	2	3	4	5
7	Internet	1	2	3	4	5
8	Email	1	2	3	4	5
9	Publishing software (e.g., Publisher)	1	2	3	4	5
10	Webpage authoring software (e.g., FrontPage)	1	2	3	4	5
11	Programming languages (e.g., Logo, C)	1	2	3	4	5

PART THREE: COMPUTER ATTITUDES

Please circle your answer

		Completely disagree	Disagree	Neutral	Agree	Completely agree
1	I feel comfortable with the idea of the computer as a tool in teaching and learning	1	2	3	4	5
2	The use of computers in teaching and learning stresses me out	1	2	3	4	5
3	If something goes wrong I will not know how to fix it	1	2	3	4	5
4	The idea of using a computer in teaching and learning makes me skeptical	1	2	3	4	5
5	The use of the computer as a learning tool excites me	1	2	3	4	5
6	The use of computers in teaching and learning scares me	1	2	3	4	5
7	The computer is a valuable tool for teachers	1	2	3	4	5
8	The computer will change the way I teach	1	2	3	4	5
9	The computer will change the way students learn in my classes	1	2	3	4	5
10	I can do what the computer can do equally as well	1	2	3	4	5

11	The computer is not conducive to student learning because it is not easy to use	1	2	3	4	5
12	The computer helps students understand concepts in more effective ways	1	2	3	4	5
13	The computer helps students learn because it allows them to express their thinking in better and different ways	1	2	3	4	5
14	The computer helps teachers to teach in more effective ways	1	2	3	4	5
15	The computer is not conducive to good teaching because it creates technical problems	1	2	3	4	5

PART FOUR: COMPUTER TECHNOLOGY AWARENESS

Please examine the list of items in the other column and answer the questions	Items
1. What hardware innovations in computer technology would be considered essential for teaching and learning in the 21st century? (Please select <u>three items</u> that you consider most essential.) i. ……. ii. …….. iii. …….. 2. Describe the value or role of each device (the three devices you have selected above) for teachers and students in a 21st century classroom? i. …… ……. ……. ii. …… ……. ……. iv. ……..... ……. ……. 3. State problems (if any) that you are facing with the teaching of ICT in your school at the back of this sheet.	Hard disk RAM CD-ROM CD (compact disk) DVD Floppy Disk Keyboard Mouse Monitor Printer Scanner Sound Card TV/Radio Card Microphone/Speaker Digital Camera Joystick Optical Scanner Overhead projection / PC Compatible Modem

Please mark each item on the list as familiar or unfamiliar

	Items	Familiar	Unfamiliar
1	Hard disk		
2	RAM		
3	CD-ROM		
4	CD (compact disk)		
5	DVD		
6	Floppy Disk		
7	Keyboard		
8	Mouse		
9	Monitor		
10	Printer		
11	Scanner		
12	Sound card		
13	TV/Radio card		
14	Microphone/Speaker		
15	Digital camera		

16	Joystick		
17	Optical Scanner		
18	Overhead Projector/PC Compactible		
19	Modem		