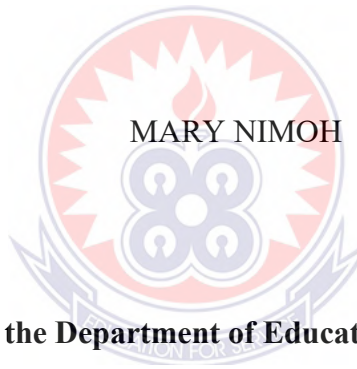UNIVERSITY OF EDUCATION, WINNEBA

PERCEPTION OF TEACHERS ABOUT THE TEACHING OF ICT IN BASIC

SCHOOLS IN ATWIMA NWABIAGYA DISTRICT

MARY NIMOH

A Project Report in the Department of Educational Leadership, Faculty of Education and Communication Sciences submitted to the School of Graduate Studies and Research, University of Education, Winneba, in partial fulfilment of the requirements for award of the Master of Arts (Educational Leadership) degree

OCTOBER, 2016

DECLARATION

STUDENT'S DECLARATION

I, MARY NIMOH, declare that this project report, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: …………………………………………

DATE: …………………………………………………

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of project report as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: PROF. MARTIN AMOAH

SIGNATURE…………………………………………

 DATE: ………………………………………….

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DEDICATION

To my lovely children, Roger Kwadwo Sarfo Boateng, Lene Afia Kyerewaa Sarfo and

Michael Adu Sarfo Kakyire.

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ABSTRACT

The aim of the study was to find out perception of teachers on the teaching of ICT in basic schools in Atwima Nwabiagya District of Ashanti Region. Specifically, it was designed to elicit respondents' view on the importance of teaching ICT. It also sought to determine the challenges that affect the effective teaching of ICT. More so, the study sought to examine the support the teachers receive from school administrators with respect to the teaching of ICT. Fifty seven ICT basic school teachers were randomly selected to respond to self-completion questionnaire which was in the form of a rating scale, the main research instrument used for the data collection. Data collected were analysed using descriptive statistics such as frequencies, percentages, means and standard deviations. The findings from the study indicated that participants agreed to the relevance of teaching ICT to the students of basic schools. In addition, participants also agreed that they face challenges such as inadequate power supply, lack of qualified computer technicians, and inadequate number of computers when teaching ICT in the basic schools. Furthermore, participants of the study indicated that they do not receive support from school administrators when teaching ICT in basic schools. From these findings, it was recommended that government should provide schools with adequate ICT infrastructure to enable schools provide effective teaching of ICT.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The rapid global technological advancement and economic development places a great investment into education (Wheeler, 2000). Nowadays, with the expansion of knowledge, advancement of technology as well as globalization issues, the profession 'teaching' becomes a central figure and most challenging, for it requires new planning and technological adaptation to cope with cultural dynamism. Teachers are implementers, and thus need to learn and apply new technologies into their classroom instructions.

Information and Communication Technology (ICT) has become an important part of most organisations and businesses these days (Zhang &Aikman, 2007). Computers began to be placed in schools in the early 1980s, and several researchers suggest that ICT will be an important part of education for the next generation too (Grimus, 2000; Yelland, 2001). Modern technology such as computer offers many means of improving teaching and learning in the classroom (Lefebvre, Deaudelin & Loiselle, 2006). The issue comes in when differentiating between whether ICTs should be used as teaching and learning aids or as a course of study especially at the basic school level.

Dawes (2001) is of the view that new technologies have the potential to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have not been possible before. The teaching of ICT has the potential to be influential in bringing about changes in ways of thinking of students. However, this potential may not easily be

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realized, as Dawes underlined when he stated that "problems arise when teachers are expected to implement changes in what may well be adverse circumstances" (p. 61).

Due to ICT's importance in society and possibly in the future of education, identifying the possible obstacles to the teaching of ICTs in schools would be an important step in improving the quality of teaching and learning of ICT. Balanskat, Blamire, and Kefala (2006) argue that although educators appear to acknowledge the value of ICT in schools, difficulties continue to be encountered during the processes of adopting these technologies and teaching them as programs in schools.

As a result of the aforementioned, in the year 2007, the Government of Ghana through the Ministry of Education introduced new educational reform. This was the second of two major educational reforms implemented in the country since independence in 1957; the first was launched in 1987 (Cobbold & Ani-Boi, 2011). The new educational reform was the Government's response to recommendations made by a committee that was appointed to review the entire educational structure in order to make it relevant to societal needs. The development of ICT at the basic education level, which is the focus of this study, is defined as the first eleven years of formal education to which every child in Ghana is entitled as a right to equip him/her to function effectively in society (Ministry of Education, 2008). It is composed of two years of kindergarten, six years of primary education, and three years of junior high school (JHS) education (2:6:3). Basic education is not only a right but also compulsory for all school age. According to Baku, Guido and Banini, (2012), the basic school curriculum in Ghana is officially defined "by the syllabuses developed on behalf of the Ministry of Education by the Curriculum Research and Development Division (CRDD) of the Ghana Education Service (GES)" (p.9).

At the end of basic education, students are to be examined on ICT as part of the Basic Education Certificate Examination (BECE) organised by the West African Examinations Council (WAEC). The extent to which these stated objectives are to be achieved depends on what teachers think and do in practice in their respective classrooms as well as other factors that affect the teaching of ICT in schools. Many studies have been conducted to investigate barriers to the teaching of ICT particularly at the basic school level (e.g. Al-Alwani, 2005; Gomes, 2005).

The introduction of ICT curriculum therefore requires that teachers have to learn new knowledge and skills, use new teaching methods, techniques and strategies as well as to work for more hours. These, together with the increase in pupil enrolments resulting from the implementation of capitation grant, the school feeding programme, free textbooks and uniform distribution as well as the special emphasis given to girl-child education, all add to the teachers' roles and responsibilities. However, the school environment in which the teachers work, particularly the classroom conditions and non- adequacy and non-availability of educational resources (computers, projectors, internet facilities etc) remain unchanged. All these presumably make the teaching of ICT in basic schools quite difficult.

1.2 Statement of the Problem

Until relatively recently, ICT as a discipline and an area of academic study has been a phenomenal success story. Since its humble beginnings almost 60 years ago, its importance and popularity have increased so that it has become one of the largest areas of study within many education institutions. However, the ICT discipline has come to an 'awkward age' at the moment, not only in Africa but across the world. With respect to successful implementation of ICT into the Ghanaian school

curriculum introduced the Information and Communication Technology Accelerated Development (ICT4AD) Policy in 2007 with vision:

> "to improve the quality of life of the people of Ghana by significantly enriching their social economic and cultural well-being through the rapid development and modernization of the economy and society using information and communication technologies as the main engine for accelerated and sustainable economic and social development". (Ministry of Education, 2008, p.2).

Strides have been made to achieve this vision but little success has been chalked with respect to the implementation of the policy especially at the basic school level. The implementation of ICT as a course of study has come under intense scrutiny. Coupled with low infrastructural development, the study of ICT in Ghanaian schools especially basic schools have has been greatly affected by teacher competence and perception about the study of the course. Osborne and Hennessy (2003) posit that the public image and public understanding of any discipline will greatly influence the teaching and learning of that discipline. They further argue that factors such as infrastructure, teacher perception and usage of ICT, students' competence and administrative issues are integral when it comes to the learning of ICT in schools. Their assumption is based on the fact that successful personal use of ICT is likely to motivate the teachers to teach ICT in various basic schools (Steel, 2009). Therefore, inter alia, it is experience that makes teachers see the value of the technology they use (Mugaloglu & Bayram 2009) and hence help them to effectively teach ICT in schools. A careful examination of Ghanaian basic schools provides no different view to the views of the above mentioned authors. Ghanaian basic schools are short of ICT infrastructure, competent teachers and low administrative support when it comes to the study of ICT. Teachers as it were are seen as a repertoire of knowledge and as such should play an integral in the learning of ICT in Ghanaian schools especially at

the basic school level. This study was therefore aimed at examining the perception of teachers about the teaching ICT in basic schools in Atwima Nwabiagya.

1.3 Purpose of the Study

The main purpose of the study was to find out the perception of teachers about the teaching ICT in basic schools in Atwima Nwabiagya District of Ashanti Region.

1.4 Objectives of the Study

Specifically, the study was conducted to achieve the following objectives:

1. To find out the importance of teaching ICT at the basic schools
2. To identify the challenges that affect the effective teaching of ICT in basic schools
3. To determine the support ICT teachers receive from school administrators
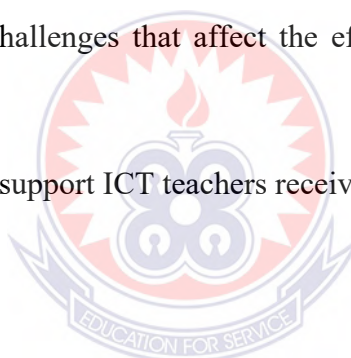
1.5 Research Questions

This study was basically guided by the following research questions.

1. How do teachers perceive the importance of teaching ICT in basic schools in Atwima Nwabiagya District?
2. What challenges do teachers face when teaching ICT in basic schools in Atwima Nwabiagya District?
3. What support do the teachers receive from school administrators when teaching ICT in basic schools in Atwima Nwabiagya District?

1.6 Significance of the Study

The findings of the study may be useful to educational planners, policy makers and administrators who wish to identify areas where materials or support are needed to ensure successful teaching of ICT in the basic schools. Moreover, the results from the study may enable curriculum developers to plan for the future and make adjustments or restructure the teaching of ICT in the schools where necessary to make it more functional. Furthermore, it would help the Ministry of Education and Ghana Education Service to develop teachers' preparation and in-service training programmes to energise and sustain teachers in teaching ICT. Finally, the information and knowledge provided by the study would not only add to but may also whip up interest in curriculum implementation in Ghana, particularly in the field of ICT curriculum.

1.7 Delimitation of the Study

The scope of this study was delimited to the perception of teachers about the teaching of ICT in the public basic schools in Atwima Nwabiagya District of Ashanti Region. The study would only attempt to explore the public basic school teachers' perception about the teaching ICT in the basic schools in relation to the importance of teaching ICT, the challenges teachers' face when teaching ICT and the support the teachers receive from school administration with respect to the teaching of ICT in public basic schools.

1.8 Limitations of the Study

The study encountered a number of challenges. Key among them was the issue of funding. Activities such as transportation, printing of questionnaires, pretesting of questionnaires and other relevant documents proved financially burdensome. Another limitation was the relatively short period (four months) within which the research was carried out. As a student who is also a full time worker, the researcher was constrained with time and this was quite challenging. Another challenge was the difficulty in getting clients to respond to the questionnaires. Even though most teachers and students of the school agreed to answer sample questionnaires, it was difficult getting most of the respondents to attend to the questionnaires. The researcher was not oblivious of and was not overwhelmed by these challenges and took steps to as much as possible minimize the effects of these challenges on the study.
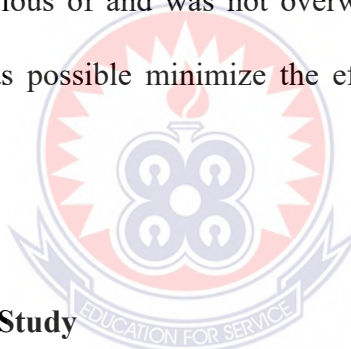
1.8 Organisation of the Study

The study had been organized into six (6) chapters. Chapter one which is Introduction presents the background of the study, problem statement, purpose and objectives of the study, research questions, significance of the study, scope of study, limitations of the study and organization of the study. Chapter Two is concerned with review of related literature. It looks at concepts and theories as they relate to the research topic and research questions. Chapter Three discusses the research methodology that was adopted. It outlines the research design, population, sample and sampling procedures, research instrument, data collection techniques and data analysis procedure.

Chapter four is devoted to the presentation and summary of results whereas Chapter Five discuses the findings from the study. The last chapter looked at the summary of the study and findings, and draws conclusions for the study. Recommendations have also been made based on the findings of the study. Finally, areas for further studies have been suggested.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The teaching of ICT in the classroom has become important, as it provides opportunities for students to learn how to operate in an information age. The study of obstacles to the teaching of ICT may assist educators in overcoming barriers and support students in becoming successful technology adopters in the future. This literature review analyses some relevant literature and aims to identify the perceived barriers to the teaching of ICT by teachers with emphasis on teachers. The availability of computer equipment per say does not in itself guarantees effective teaching of ICT (Mikre, 2011). Grimus (2000) posited that successful instructional delivery is a complex process, determined by pedagogical values, attitudes, curricular needs and physical infrastructures. Ozden (2007) concluded that successful learning of technological subjects is not simple, because it depends on such interlinking variables. ICTs are radically transforming the curriculum in a number of ways, demanding that teachers reflect on new pedagogy and not the traditional methodologies for instructional delivery. Teachers themselves assert that the teaching and learning of ICT will greatly enhance the learning experience of not only the students but teachers as well (William, 2000). The growth of ICT itself dictates that in order for students to adjust to modern society and the global economy, the way in which they are taught and what they are taught, requires adjustments to and around ICT (Watson, 1999). Buabeng-Andoh (2012), however argues that although teachers appear to acknowledge the value of ICT, difficulties continue to be encountered in adopting and integrating such technologies. Kozma (2005), conclude that although many teachers are comfortable with technology in general, they still may not be ready or capable to

integrate such technology and as well teach. The following section will provide a brief overview of what the teaching of ICT means. Portion of the proposal presents the literature review on the topic, both theoretical empirical conceptual framework on the challenges teachers face when teaching ICT in schools have also been reviewed.

2.2 Meaning of the teaching of ICT

In order to appreciate what is meant by teaching ICT, it is important that we know the origin of ICT and what it really is. Research has it that the use of computers became popular in the 1980's when personal computers became available to consumers. Again research has shown that it is this global competition that has influenced governmental policies all over the world in ensuring that they keep pace with these technological advancements. These policies motivated the mass production of computers for schools. Several researchers suggested that ICT will be an important part of the education process for the next generation.

According to Pelgrum & Law (2003) history has it that towards the end of the 1980's, the term 'information technology' began to replace the word 'computer'. The term information technology therefore referred to computer's processing ability, indicating a shift from computing technology to the capacity to store and retrieve information. Again, Pelgrum and Law posited that the term ICT emerged, signaling the introduction of e – mail and electronic messaging with computer technology. Simply put ICT is an accepted acronym of the word information communication technology. It is a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information (Carol, 1997). This means that ICT helps in the storage and management of information.

Moreover, Murphy, Coover and Owen (2002) defined ICT as the use of computer systems and telecommunications equipments in information processing. Finally, ICT as described by Steel (2009) encompasses a range of applications, communications and technologies which aid information retrieval and research communication and administration. These include: Internet access, electronic mail, CD-ROMS, telephone, on line databases, library services and fax machines.

The emerging phenomenon was welcomed in the 1980's that educational systems needed to prepare students to adjust to and survive in this new technologically driven society. This meant preparing students for "lifelong leaning in an information society" (Pelgrum & Law, 2003, p.20). Allied to this, early advocates of ICT integrated education, saw it as a catalyst for change, fostering skills in problem solving and critical thinking, as well as the development of student centred learning (Papert, 1999). In the view of Kozma (2005), there are three rationales for the introduction of ICT into education. The first one is the economic rationale which refers to the role it can play in preparing students as future workers and in supporting economic development. The second is the social rationale where ICT investment aims to: increase knowledge sharing, encourage cultural creativity, increase civic participation, make government services more accessible and finally enhance social cohesion. The third and final rationale is the educational and pedagogic rationale where ICT can advance educational reform and improve educational management structures.

Similarly, Cuban and Kirkpatrick (2012) broadly concur, identifying three reasons for the teaching and learning of ICT in education: the development of new skills for the information age, increased productivity and the development of quality learning. Whereas Kozma (2005) posits that there are three rationales for the

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introduction of ICT into education, Veen (1996) proposes four rationales for the utilization of computers in schools. He notes these as social, vocational, pedagogical and catalytical. The social and vocational rationales point to the increased use of ICT in all spheres of human activity. The pedagogical and catalytically rationales relate to the effects of technology on students and schools. Grimus (2000) arguments for teaching ICT in schools stem from technological and socially determined points of view. His standpoint is that the school systems within which ICT is taught, is driven by ICT. Grimus (2000) argues that a change occurs within the education system using and teaching ICT and that change is as a result of the effect of technology. Grimus further claims that the social context sees ICT as neutral technology-technical means of achieving a defined purpose in education.

Two contexts emerge and are used in this study. The social context and the pedagogical context. The social context runs along the lines of Gomes (2005) social and vocational rationales, whiles the pedagogical context agrees with Gome's pedagogical and catalytical rationales. The pedagogical context also agrees with the views of Farrell and Isaacs (2009), identify three objectives for the teaching of ICT in education.

They are: the use of ICT as a 'discipline or profession'; ICT as a "teaching or learning medium' and the use of ICT as an 'object of study" (Farrell & Isaacs, 2009, p.7). It can be gleaned from these objectives that teaching of ICT involves teachers understanding the context of pedagogy with respect to ICT.

2.3 Importance of ICT to Education

The importance of ICT (Information and Communications Technology) in the school curriculum has been emphasised recently by government initiatives involving increasing investment in ICT facilities related to teaching, learning and teaching with ICT. Several studies argue that the study of ICT is essential for providing opportunities for students to learn to operate in an information age. It is evident, as Yelland (2001) argued, that the study of the humanities do not seem to be suitable for preparing learners to function or be productive in the workplaces of today's society. She claimed that organisations that do not incorporate the study of new technologies in schools cannot seriously claim to prepare their students for life in the twenty-first century. This argument is supported by Grimus (2000), who pointed out that "by teaching ICT skills in primary schools the pupils are prepared to face future developments based on proper understanding" (p.5).

The study of ICT as a course of study has become an unstoppable force in recent years (Sicilla, 2005). ICT impacts on a large section of education, from record keeping and school websites to the creation of online learning communities. The teaching and learning of ICT however requires undoubted potential on the part of teachers in other to influence its impact on students. Studies have also demonstrated that ICT study can result in effective literacy gains. There is empirical evidence that students, who are having difficulties with reading, can be motivated and engaged to use ICT to support further studies (Kargiban & Siraj, 2009).

Hew and Brush (2007) conclude that the use of ICT has had positive effects on students that are marginalized as a result of personal or familial issues. Even though the study of ICT requires inept knowledge on the part of the student, ICT has the

potential of enacting students' practical ability. Thus ICT helps students to potentially do something right after school instead of relying on the government for job creation. Research has shown that many students benefit from the study of ICT (Schiller, 2002). Al-hardi (2012) claims that student achievement in the study of ICT depends immensely on the teacher's ability to give immediate feedback or rewards. Again, Papert (1993) asserts that the computer is a tool, allowing for the construction of higher order thinking, facilitating users to take responsibility for their learning, while Levin and Wadmany (2008) refer to the teacher's ability to motivate learning. The teacher is not left out when it comes to the benefit derived from the teaching and teaching with ICT. Modern educational software uses sound, animation, video and interactivity, assisting the different intelligences proposed by Gardner in his Multiple Intelligences Theory. Kim and Khine (2006) assert that the computer has enormous potential in developing the various multiple intelligences proposed by Gardner.

Kozma (2005) underlined this notion by suggesting that ICT can be used to improve delivery of and access to education. In learning ICT skills, the student becomes better equipped for the world of work, which increasingly demands such competency. Furthermore, Pelgrium and Law (2003) claim that the study of ICT is transforming education by introducing students to a new curricula based on real life problems, providing different tools to enhance learning, providing students and teachers with more opportunities for feedback and reflection.

Social Constructivism places emphasis on this type of student centred learning, viewing the teacher as a guide or facilitator, motivating students to discover things for themselves (Vygotsky, 1978). Schoepp (2005) claims that constructivist approach must dominate the learning environment for technology to have a significant impact on the education of the child. However, it must be remembered that the study

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of ICT in classrooms is a relatively new phenomenon when compared to traditional subjects and as such must be treated with caution. While there have been notable critics (Kirkpatrick & Cuban, 2012), most research strongly supports the premise that ICT enhances the thinking faculty of the child whilst augmenting the teaching and learning process.

Furthermore it has been argued by Tong and Trinidad (2005) that if one defines student learning as the retention of basic skills and content information, as reflected in standard tests, then evidence suggests that there is a positive relationship between ICT studies and students achievement in other subjects. According to Dawes (2005), computers as pedagogical tools in Computer Assisted learning or Computer Assisted Instructions offer advantages over other methods of teaching and have revolutionized education in advanced countries when it comes to teaching and learning of ICT. Brandy (2011) concurs with Jones (2004) that computers are useful tools for pupils' drills and practice. Tutorial activities, guided discover, building intellectual structures, data retrieval and data manipulation should be used when teaching students ICT by teachers.

The computer serves as a cognitive tool. Its software programs are able to amply, extend or enhance human cognition (Kozma, 2005). They are designed to aid users in task relevant, Cognitive components of a performance, leaving the performance open-ended hand controlled by the learner (Veen, 1996). The impedance of ICT in teaching and learning has prompted Carol (1997) to declare that a real learning revolution has started, in which educators use information technologies to provide learning experiences that are qualitatively different from their predecessors. Added to the advantages ICT offer in education, Gomes (2005) recommends that ICT should not be seen as the only as a subject, but as one of a number of possible tools

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which could be used to teach content and skills. Cox, Preston and Cox (1999) suggested that the advent of ICT has revolutionized learning related to accessing, evaluating and using information resources in digital library environments today in schools. In line with that Lefebvre et al. (2006) recommends that a sound understanding of computers and information technology with a pedagogy focusing on developing students' knowledge and skills is required, Lefebvre's et al. recommendation is to manage, process and utilize the enormous variety of information that ICT provides. More so, Gomes (2005) highlights the effect of ICT in teaching especially as a program or course of study stating that considering the relevance of computers in schools, is of the opinion that computers have become catalysts for teaching, helping students to be less dependent on teachers and enhance collaborative learning. Kim and Khine (2006) however, state that evidence shows that to innovate and create stocks of information and knowledge by utilizing ICT, developing nations need telecommunication networks that can support electronic data exchange. Baku et al. ((2012) point out that many schools in Ghana can boast of a computer laboratory through which students are gaining basic computer literacy. A number of these schools have Internet facilities, enabling students to deepen their connection to the outside world. Although this is encouraging information, extensive review of documents of NGOs that are spearheading ICT implementation in Ghanaian schools reveals that most schools now benefiting from ICT are either located in urban areas or are classified as premier schools (Baku et al., 2012; Afful-Dadzie, 2010).

According to Afful-Dadzie (2010), computer literacy education in Ghana has been concentrated in major urban areas. A few better schools in countryside have attempted to "catch up" with their urban counterparts by contracting with private companies to provide computer education. Contrary to the promising notion of ICT as

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a means of knowledge production, numerous scholars have highlighted the need to address the numerous problems that the introduction of ICT will bring. These issues include: a lack of adequate planning for implementation of ICT (Odera, 2011); inadequate teacher training (Acquah, 2012), inequalities in ICT distribution (Afful-Dadzie, 2010), lack of information regarding the distribution of ICT, low levels of literacy in general, and lack of relevant content and technology applications to meet the needs of diverse societies (Farrell & Isaacs, 2009).

A review of the available literature reveals significant inequity in the implementation of ICT in Ghanaian schools. The literature (Baku et al., 2012; Afful-Dadzie, 2010) reveals that ICT provision in schools is skewed in favour of schools categorized as premier schools and schools in urban areas. Moreover, teachers have been found to possess little or no competence in the implementation of ICT policies in the country. Teachers' perceptions have been known to greatly affect how they teach ICT or apply ICT in teaching. Therefore it is critical that policy makers ensure that teachers are the fore front of implementation of any educational policy especially when it comes to technologies.

2.3 Challenges Teachers face in Teaching ICT

In general, the research literature on the implementation of ICT policies shows that it involves a large number of influencing factors (Buabeng-Ando, 2012). Researchers normally make a distinction between non-manipulative and manipulative school and teacher factors by reviewing several studies on factors that influence teachers' decisions to use and teach ICT. Non-manipulative factors are factors that cannot be influenced directly by the school, such as age, teaching experience, computer experience of the teacher or governmental policy and the availability of

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external support for schools (Dawes, 2001). On the other hand, manipulative factors refer to the attitudes of teachers towards teaching and ICT, ICT knowledge and skills of teachers, commitment of the school towards the implementation process and availability of ICT support (Dawes, 2001).

2.3.1 Non-manipulative school and Teacher Factors

2.3.1.1 Teacher Characteristics

Teachers' characteristics (e.g. individual's educational level, age, gender, educational experience, experience with the computer for educational purposes and financial position) can influence the adoption of an innovation (Schiller, 2002). The report by the National Center for Education Statistics as cited in Hew and Brush (2007) in the UK indicated that teachers with fewer years of experience in using computers and other ICT were more likely to teach ICT well in their classes than teachers with more years of experience. More specifically, teachers with three years or less teaching experience reported using computers 48% of the time; teachers with 4-9 years, 45% of the time; those with 10-19 years, 47% of the time, while teachers with 20 years or more reportedly used computers only 33% of the time (National Center for Education Statistics as cited in Hew & Brush, 2007). This may be due, in part, to the fact that new teachers have been exposed to computers during their training and therefore, have more experience using this tool to teach.

Then, one of the factors that determine the extent to which teachers teach ICT may be the number of years they have been teaching the program. The researcher in her exploit recognized that most teachers' especially teachers had taught for five years and over. These teachers however had little or no experience with the use of computers, talk less of teaching it as a course of study. Moreover, Mikre (2011)

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investigated about age and gender differences in the overlooked context of individual adoption and sustained usage of technology in the workplace using the Theory of Planned Behavior (TPB). Mikre (2011) studied on user reactions and technology usage behaviour over a 5- month period among 355 workers being introduced to a new software technology application. The results showed that the decisions of men and younger worker were more strongly influenced by their attitude toward using the new technology. In contrast, women and older worker were more strongly influenced by subjective norm and perceived behavioural control. Then, these groups of people adopt very different decision processes in evaluating new technologies.

On the other hand, Albirini (2006) found that age was not a significant factor in relation to teachers' attitudes towards ICT. The researcher holds a different view to Albirini's view as observation by the researcher found out that younger teachers were more likely to use ICTs than older teachers. This finding confirms the results of Mugaloglu and Bayram's study (2009) that the probability that teachers would use and teach ICT was limited by the reality that teachers who were educated 20 years ago were trained by people who themselves were trained before the arrival of computers in schools.

In addition, Oladosu (2003) carried out a study about technology integration in the schools. They used a qualitative study to examine the classroom practice of 30 "tech-savvy" teachers who taught computer technology and other ICTs in school. They found that the teachers were highly educated and skilled with technology, were innovative and adept at overcoming obstacles, but that they did not integrate technology on a consistent basis as both a teaching and learning tool. They stated two reasons regarding these findings: students did not have enough time at computers, and teachers needed extra planning time for technology lessons. The researcher believes

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even though training could be given to teachers on effective use of ICT, teachers should designate enough time to practice of ICTs. This would give them greater depth of knowledge on the course. Other concerns that can be outlined within the non-manipulative factors include out-dated hardware, lack of appropriate software, technical difficulties, and student skill levels. Furthermore, there are other personal characteristics that may influence how teachers use teach ICT. The teacher's own learning style is certainly one such factor. For example, if a teacher is a creative thinker who likes the idea of constructing knowledge, is a life-long learner, a social learner, and a decision maker, he may be more likely to use computers in more integrative and transformational ways that are useful and valuable to students instead of ways that promote and support traditional classroom practices (Swarts & Wachira, 2010; Zhang & Aikman, 2007).

Therefore, personal characteristics of teachers are an important influence on how easily they take up an innovation. Support for this is provided by a classic American study of the diffusion of innovations. Rogers (1995) found that innovators are divided into five categories, depending on the stage at which they take up an innovation. The initial innovators typically form the first 2-3 % to take up an innovation, while early adopters make up the next 13-14%. These two groups together might be called the earlier adopters. This is important when looking for ways to encourage further take-up, because Rogers identifies a tendency for there to be distinctive differences in the personality characteristics of earlier and later adopters. As he summarizes it, earlier adopters differ from later ones in tending to show greater empathy, less dogmatism, a greater ability to deal with abstractions, greater rationality, a more favourable attitude towards change, a better ability to cope with uncertainty and risk, a more favourable attitude toward science, less fatalism and

higher aspirations. This characterization implies a distinctly unfavourable perception of later adopters. However a positive description of later adopters is not hard to provide. Compared to earlier adopters, later adopters could equally well be described as more realistic, steadier in their judgments, with a concrete grip on problems, having a dislike for fads, being less willing to take unnecessary chances, having a preference for being guided by experience and with a more realistic appreciation of possibilities than earlier adopters.

2.3.1.2 Lack of Parent and Community Support

One way in which schools can move to student-centred use of ICT is through links with the wider community. Such links enable the development of a more authentic and contextualized approach to learning ICT supported by the use of ICTs (Grimus, 2000). Thus, human responsibilities, roles and priorities within the community must be rearranged. For example, assessment methodologies should be redesigned to allow all interested community members to play an appropriate role. In this respect, Granger and his colleagues (2002) studied on four schools to identify factors contributing in successful adoption of ICT by teachers as a course of study. Based on their findings, they concluded that successful adoption required not only computers but commitment and community, with the last two being closely interlinked. Also, they added that the schools worked continually with questions of equity, privilege, language, and community support. Each aimed to develop a philosophy of pedagogy informed by the unique characteristics of their specific communities.

In addition, Makewa, Meremo, Role and Role (2013) carried out a study on innovative practice adopting ICT in schools. They showed how a school used the

introduction of laptops to build up a 'connected learning community' in an area of lack of social and economic context. Makewa and his colleagues categorized the main elements of the model developed by the school. They are as follows:

The creation of an "open access" school where dialogue about learning between parents and teachers and children was encouraged;

1. The provision of laptops at school and home: for pedagogical and personal purposes; to develop pupils' ICT skill and competence; and to support the adoption of new teaching approaches which motivate students and parents and which give students a sense of success;

2. The arranging of e-Mentors in industry for students with little family history of formal employment;

3. Access to skill development in ICT for parents through adult education courses on site;

4. A network of support for students and parents learning about ICT together;

5. The provision of a crèche to support parental access to learning;

6. The celebration of the learning of adults and children through assemblies.

Therefore, instead of taking innovative ICT-based learning to the students, the students are taken to the innovative learning. Teachers should be aware of the influence of home on school success. When parents are encouraged to participate in and contribute to change management activities within a school's ICT master plan, change occurs more quickly (Al-Alwani, 2005). For some of the schools that the researcher visited, morale was generally high in these schools, while teachers, students, and parents were excited about the level of innovation in the school and quite anxious to share their experiences with others. Hence, parent and community

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support can influence the implementation of ICT policies in education especially when it comes to teaching it as a course of study.

The researcher is of the view that teachers aside teaching must explore business partnerships to support technology initiatives in schools. To involve parents in the decision-making process, school leader must host ICT information or education events for community. Therefore, ICT facilitates linkages among schools, homes and communities, enabling teachers, peers, parents and members of the community to play a greater role in the students' learning experiences. These experiences include engaging in authentic problem solving, working with researchers and honing their entrepreneurial skills. The bonds between schools and homes and communities are also strengthened through increased interaction and communication.

2.3.2 Manipulative School and Teacher Factors

2.3.2.1 Availability of Vision and Plan about the Contribution of ICT to Education

Teachers need to know exactly how ICT is used as a teaching and learning tool and as a course or program of study. Many researchers have pointed out that a school's ICT vision is essential to effective ICT adoption (Obiri-Yeboah, Kwarteng & Kyere-Djan, 2013). Bennett (1996) stressed the importance of a "well-defined mission that describes technology's place in education" (p. 6). In line with this idea, Ertmer (1999) wrote, "A vision gives us a place to start, a goal to reach for, as well as a guidepost along the way" (p. 34). Also, Allan, Yuen and Wong (2003) recommend that teachers and schools must develop a vision before they make substantial investments in hardware and software. In other words, users and teachers of technology must have a fundamental belief in the value of innovation or the

innovation is doomed to failure. Teachers must have opportunities to study, observe, reflect, and discuss their practice, including their use of ICT, in order to develop a sound pedagogy that incorporates technology (Korte & Husing, 2007). Hence, the vision should not be created by a single person or through a top-down process starting from the Ministry of Education.

It is crucial to involve those who have a stake in the outcomes, including teachers, parents, students, and the community, and allow them to assist in the creation of the vision by contributing their knowledge, skills, and positive attitudes. Therefore, a clear vision of ICT adoption in schools that is shared by all members of the school community promotes effective teaching of ICT. Once the vision has been successfully created and accepted, the next step is to articulate an ICT adoption plan, spelling out how the teachers are expected to integrate technology in their lessons (Obiri-Yeboah et al., 2013) particular ICT teachers. In fact, an ICT master plan that is formulated according to a school's vision and its sociocultural setting assures effective adoption of ICT (Grimus, 2000).

Gulbahar (2007) conducted a study to illustrate how technology planning process was carried out in a private K-12 school in Turkey. Data were collected from 105 teachers, 25 administrative staff, and 376 students. Findings of this study indicated that educational institutions must develop a technology plan in order to use technology in an effective and efficient manner for teaching, learning and administrative purposes. Also, some issues that should be considered include staff and student development in ICT-related skills, curriculum and assessment, ICT facilities and resources and support teams (both technical, administrative and pedagogical). Therefore, an ICT adoption plan provides a detailed blueprint of the steps and methods needed to translate the school ICT vision into reality. Developing ICT

adoption plans is no doubt a complex and time consuming task, but they are usually well worth the time required to put them together.

2.3.2.2 Level of and Accessibility to the ICT Infrastructure

Using up-to-date hardware and software resources is a key feature to diffusion of technology (Gulbahar, 2007). In recent years, most of the schools are equipped with different kinds of technological infrastructure and electronic resources available. For instance one Australian school has reported that this school has provided personal notebook computers and their own web spaces, email access and workspace for all staff, and students from Year 5 onwards.

Video conferencing is available and the school has established its own intranet, placing all its resources on-line. These are accessible via radio connections from school and home. In this college the use of radio is seen as an innovation that has completely changed the nature of teaching and learning (Richardson, 2000). This implies that training of teachers is not the only way to efficient ICT teaching and learning but schools must make adequate provisions of infrastructure too to augment the effort of teachers.

Appropriate resourcing and flexible, forward-looking planning, linked closely to what teachers actually want and need at any given stage, will be essential. Albirini (2006) carried out a study examining the factors relating to the teachers' attitudes toward information and communication technologies. A questionnaire was designed to collect evidence from basic school English teachers about their perceptions of computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer training background). The sample consisted of 63 male and female teachers. The results showed that a relatively high

percentage of the respondents (57%) had computers at home while only 33.4% of the respondents had access to computers at school. This percentage gives a clear indication of the insufficiency of computers at schools of developed countries, particularly for teacher use. Similar situations are recorded in developing countries such as Ghana. Thus, Albirini's findings substantiated this globally felt barrier that computer access has often been one of the most important obstacles to technology adoption and integration worldwide (Pelgrum & Law, 2003). On the other hand, Mumtaz (2000) stated that many scholars proposed that the lack of funds to obtain the necessary hardware and software is one of the reasons teachers do not teach ICT effectively. Also, a report on teachers' adoption of technology by the National Center for Education Statistics as cited in Hew and Brush (2007) in the United Kingdom indicates a correlation between availability of computers and computer use. In general, teachers who had computers in their classes were more likely to use them in instruction than teachers who did not; more than 50% of teachers who had computers in their schools used them for research and activities related to lesson preparation. A total of 78% of teachers surveyed cited limited access to computers as a barrier to effectively teaching and using computers and other ICTs. Therefore, efficient and effective use of technology depends on the availability of hardware and software and the equity of access to resources by teachers and students.

2.3.2.3 Availability of Time, to Experiment, Reflect and Interact

According to Mumtaz (2000), lack of time is a factor that hinders technology adoption by teachers in schools. This barrier becomes manifest in two ways: (a) release time and (b) scheduled time (Mumtaz, 2000). Results of a study conducted by the National Center for Education Statistics as cited in Hew and Brush (2007) with

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teachers revealed that 82% of the participants thought that lack of release time was the most significant factor that prevented them for using computers and as well preparing effectively for ICT classes. Teachers felt that, with their regularly scheduled classes, they did not have enough opportunities to practice the use of ICTs. The issue here is most teachers do not only find it teaching ICT but also had issues using ICTs in their day to day life especially for lesson preparation.

Also, lack of time scheduled on the timetable to use computers with students is a factor mentioned by teachers as a barrier to using computers in their classes. Approximately 80% of the teachers surveyed in the aforementioned study thought there was not enough time scheduled for students to use computers. The researcher in his observation of schools found an inappropriate allocation of time on school timetables for teaching of ICT. For some schools, ICT was seen as a peripheral course that was needed just to give students knowledge on the use of only the computer. Some teachers of the schools the researcher visited believed time allocation also never favoured their busy work schedules. Even though some of the teachers had a genuine need to use computers with their students, there was no available time to do it. Hence, the lack of time required to successfully adopt ICT is not reassuring in certain schools.

2.3.2.4 Available Support to Computer-Using Teacher in the Workplace

The researcher also found out that the lack of technical support as one of the major barriers that resulted in computers being underutilized in the classes. Teachers did not want to use computers because they were not sure where to turn for help when something went wrong while using computers. Jones (2004) carried out a study on barriers to adopting technology for teaching and learning. Regarding to the role of

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technical support staff, they recommended that schools should work to convince technology staff that reliability is very important, especially concerning technology in classrooms; encourage the purchase of highly reliable technologies; improve systems for checking and maintaining classroom technologies; create new approaches (including staff training) to assure that extremely rapid responses are made to breakdowns; new classroom technology setups should be tested by faculty before they are installed; classrooms should be as similar as possible; differences in the technologies in each classroom should be well documented ; help faculty learn by encouraging faculty discussions about teaching, learning and technology; identify faculty who have used and evaluated the impact of technologies on learning and organize a workshop, conference, or set of papers to make this information more widely available to faculty; encourage faculty to assess and evaluate the impact of technologies on learning; identify attitudes and behaviours that are seen as poor or inadequate support and work with technology staff to reduce these; rapid response system must be in place that can deal with a wide range of problems. Therefore, lack of technical support is very stressful for the teacher, which may affect the teacher's willingness in the adoption of ICT (Tong &Trinidad, 2005).

On the other hand, appointing an ICT coordinator or head of the ICT department in each school helps to assure administrative and pedagogical support for the teachers. This appointment should not be confused with that of a technology assistant. The ICT coordinator or head of department should advise teachers on ICT solutions to their teaching or learning problems, help teachers to acquire ICT resources, and conduct training needs assessment of teachers' ICT-related capacities and advise them on their professional development (Madzima, Dube & Mashwama, 2010).

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Regarding to the in importance of technical coordinator in school, the National Center for Educational Statistics as cited in Hew and Brush (2007) reported that about 68% of the teachers surveyed believed that lack of support regarding ways of using technology in the class hindered technology use. The survey also found that teachers in schools with no technical coordinator were more likely to cite lack of technical support as a barrier to their use of technology than teachers in schools with a technical coordinator. Also, sixty-four percent of the teachers surveyed identified lack of technical support or advice as a barrier to using technology in their classes. Hence, lack of on-site support is one of the reasons that teachers do not use technology in their classes.

In addition, Bosley and Moon (2003) review the literature on the study of Information and Communication Technology within an educational context. They mentioned a case study research in the UK that identified a number of factors that enable teachers to successfully engage in innovative practice. These were: support at senior management level for implementing new practices and addressing financial implications where appropriate; involvement of several members of staff; fostering culture within schools of collaboration and mutual support; and lastly willingness to take risks. The role of school leadership is clearly central in meeting several of these preconditions and the teacher is integral to this processes. In fact, teachers need both technical and administrative support when they decide to use technology in their classes. Although infrastructure is important, leadership is an important element in establishing technology as a part of school culture (Anderson & Dexter, 2000). Fullan (2007) believes that the role of the leader is crucial to the successful implementation of educational innovations. Similarly, Baylor and Ritchie (2002) describe leadership as a critical predictor of ICT integration, since it focuses on promoting the use of ICT

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at a strategic and action level: "teachers who wish to nurture a technology culture need to join in rather than sitting by the side" Baylor and Ritchie (2002). Then, if leaders are cognizant of the benefits to be gained from teaching ICT, technology usage is also likely to improve in schools.

To promote ICT adoption in schools, school leaders should adopt strategies that make ICT a part of the daily routine or tasks of the teachers. These strategies may include using e-mail as the mode of communication among staff, accessing the Intranet to download forms and use a word-processor to complete lesson plans for submission (Bangkok, 2004). Therefore, school leaders should be a role model and should make ICT a tool in his everyday life.

2.3.2.5 School Culture

Social system is an important parameter in the innovation diffusion process (Rogers, 1995). Martinez (1999) found that one of the major challenges facing developing countries is to make technology an essential part of the culture of the people. According to Hodas (1993), the diffusion of technologies may be inhibited by the micro culture of a certain institution or organization. Hence, acceptance of a new technology in a society depends on how well the proposed innovation fits the existing culture. Therefore, there must be a match between organizational culture and new technology into an organization. Within the school organization, school culture is an important consideration in terms of ICT adoption (Tearle, 2003). School culture can be defined as the basic assumptions, norms and values, and cultural artefacts that are shared by school members (Maslowski, 2001). These meanings and perceptions indirectly affect attitudes and behaviour in the organization of schools (Cavas, Cavas, Karaoglan & Kisla, 2009). Hence, if the technology is not received well by teachers

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especially teachers, there must be a mismatch of values between the culture of schools and the technology (Albirini, 2006). Thus, teachers who have positive perceptions about the cultural relevance of computer technology will see to the adoption of ICT in the school.

2.3.2.6 Level and Quality of Training for teachers on ICT

Professional development of teachers sits at the heart of any successful technology and education program. Baylor and Ritchie (2002) carried out a quantitative study that looked at the factors facilitating teacher skill, teacher morale, and perceived student learning in ICT adoption schools. They found that professional development has a significant influence on how well ICT is embraced in the school. Also, they added that teachers' training programmes often focus more on basic literacy skills and less on the integrated use of ICT in teaching.

Despite the numerous plans to implement ICT policies in schools, however, teachers have received little training in this area in their teacher education programs (Bingimlas, 2009). According to Schaffer and Richardson (2004), when technology is introduced into teacher education programs, the emphasis is often on teaching about technologies and not teaching technology or teaching with technology. Hence, inadequate preparation to use technology is one of the reasons that teachers do not systematically use computers in their classes. Teachers need to be given opportunities to practice using technology during their teacher training programs so that they can see ways in which technology can be used to augment their classroom activities (Sicilia, 2005). Teachers are more likely to teach ICT effectively, when professional training in the use of ICT provides them time to practice with the technology and to learn, share and collaborate with colleagues.

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On the other hand, training school students to serve as technology experts may aid the adoption of computers into the classroom setting (Hruskocy, Cennamo, Ertmer and Johnson, 2000). This is why the issue of adopting ICT in schools should be taken seriously by not only the teachers but students as well. Hruskocy et al (2000) carried out a study on training students to become technology experts for teachers and peers. Based on this study, ten teachers of grades one through five sent their students to the training sessions. The strengths and limitations of the programmes were evaluated through reflection papers prepared by each member of the university team. The strengths of the programmes showed that teachers became more frequent users of technology, expressed a greater desire to learn along with their students. Teachers became more curious about their students' expanding computer skills and enthusiasm and lost their reluctance to ask questions. In the end, teachers began to use their students' expertise to increase their own computer skills. Also, students' skills were transferred to the classroom, and teachers became more motivated to teach computer related courses in their schools.

2.3.2.7 Attitude towards ICT

Drent and Meelissen (2007) conducted a study about factors which stimulate or limit the innovative use of ICT by teacher educators in the Netherlands. The study used questionnaires for 210 teachers and interviews for 4 of those teachers who had responded. Their findings showed that several factors such as a student–oriented pedagogical approach, a positive ICT attitude, computer experience, and personal entrepreneurship of the teacher educator have a direct positive influence on the innovative use of ICT by the teacher. Also, comparison between these factors in

predicting computer use identified that attitude toward computer contributed more in explaining ICT teaching on the part of teachers.

In addition, educational theorists and researchers have realized that an important factor in the implementation of computers is users' acceptance, which is in turn influenced by their attitudes towards these media (Koohang, 1989). Teachers' attitudes have been found to be major predictors of the adoption of ICT in educational settings (Almusalam, 2001). The successful adoption of technology in the classroom depends to a large extent on the teachers' attitudes toward these tools (Lawton & Gerschner, 1982). In fact, it has been suggested that attitudes towards computers affect teachers' use of computers in the classroom and the likelihood of their benefiting from training (Kluever, Lam, Hoffman, Green & Swearinges, 1994).
Positive attitudes often encourage less technologically capable teachers to learn the skills necessary for the implementation of technology-based activities in the classroom especially when teaching ICT. Harrison and Rainer (1992) found that participants with negative computer attitudes were less skilled in computer use and were therefore less likely to accept and adapt to technology than those with positive attitudes. They concluded that changing individuals' negative attitudes is essential for increasing their computer skills. Therefore, if teachers want to successfully adopt technology, they need to possess positive attitude to use technology. Such attitude is developed when teachers are sufficiently comfortable with technology and are knowledgeable on its use.

Moreover, poor previous ICT experience among teachers can clearly be regarded as a very real barrier to ICT teaching in the classroom. Drent and Meelissen (2007) posit that solid experience in the use of ICT and the changes related to ICT, support the development of a learner centered pedagogical practice, while Becker

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(1994) views substantial previous computer use by teachers, as one of the key determinants, in his classification of teachers, as either 'exemplary computer-using' or 'non-exemplary computer-using'. With this in mind, teacher trainees should be given adequate I.T education coupled with pragmatic usage of technological devices to enable them get acquainted with modern trends of I.T tools to help them teach ICT effectively in basic schools.

2.3.2.8 Computer Competence

According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. Also, he found that teachers' lack of knowledge and skills was the second most inhibiting obstacle to the study of ICT in schools. Similarly, in the United States, Knezek and Christensen (2000) hypothesized that high levels of (attitude), skill and knowledge (proficiency), and tools (level of access) would produce higher levels of technology adoption that will reflect on student achievements positively. Their model postulated that educators with higher levels of skill, knowledge, and tools would exhibit higher levels of technology adoption in schools. Moreover, Berner (2003) studied the relationship between ICT adoption in school and seven independent variables: perceived relevance; desire to learn; emotional reaction to technology; beliefs about computer competence; beliefs about technology; administrative support; and peer support. He found that the faculty's belief in their ICT competence was the greatest predictor of their adoption of ICT. Therefore, teachers should develop their competence based on the educational goals they want to accomplish in ICT.

In addition to the factors mentioned above, there are other factors that influence teachers' decision to adopt ICT. They are collegiality among computer

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using teachers, self-image, student- oriented educational philosophy of the teacher, positive views about the impact ICT has on teachers' work, perceived changes, student-oriented pedagogical approach, personal entrepreneurship, professional engagement, self- confidence, and willingness to change.

However, the research literature on factors influence the implementation of ICT in education has a relatively long history and is international in nature (Jones, 2005). If one is aware of these factors 'teacher level factor' and 'school level factor' steps can be taken to gain success in technology adoption process.

Most of the literature reviewed focus either upon the individual teacher or upon the school as a whole as the unit of analysis. However other issues emerge about the innovation tasks facing both if they are viewed together. The study by Ertmer and her colleagues (1999) offers one useful framework for making this connection. They identified three levels of teachers' ICT adoption, varying in their relationship to the existing curricula. These involve using ICT as: (1) a supplement to the curriculum, (2) a reinforcement or enrichment of the curriculum, or (3) a facilitator for an emerging curriculum. However, these three categories help us to distinguish the positions of whole schools as well as individual teachers. This enables us to speculate about what the implications might be of various kinds of match and mismatch between a schools' position and that of an individual teacher within it. The position is different again in schools where both teacher and school favour using ICT to promote an emerging curriculum. Many of the sources, such as Evans (2002) and Richardson (2000) show such schools as learning organizations that are continually looking for ways of improving teaching and learning. These schools train their teachers to use technology as a tool, and to transform their classrooms into interactive, inquisitive learning environments whilst also teaching the course "ICT".

2.3.2.9 Effective Training Program

The teacher has an important role to play in the teaching/learning paradigm shift, with ICT facilitating the development of a higher level of cognitive skills in evaluating arguments, analyzing problems and applying what is learnt. Although teachers play an important role in the learning environment, they are often not consulted regarding changes to teaching learning procedures (Bangkok, 2004). In fact, the teachers' needs under changing conditions have to be continuously assessed and activities to satisfy these have to be developed. So, professional development is necessary for teachers to enable them to effectively use technology to improve student learning. Staff development should be collaboratively created, based on faculty input and school needs. It must prepare teachers to use technology effectively in their teaching. According to Spillane (1999), teachers who have a strong engagement towards their own professional development are more motivated to undertake activities, which lead to a better understanding of the goals of an innovation. Similarly, Fullan (2007) pointed out that teachers who are actively involved in their own professional development are more able to implement changes in their teaching. Hence, having a recognition system for innovative and effective use of ICT adoption in schools will motivate teachers to use ICT in teaching all subjects including ICT. For example, formal certification of in-service professional development that leads to diplomas or degrees could provide an incentive for teachers to upgrade and update their skills in and knowledge of ICT. In line with this idea, Fullan (2007) suggested that training should not be one shot workshops, but rather ongoing experiences so that learners can be kept up to- date with ever-changing technologies. Teachers need follow-up training sessions to ensure that they keep abreast with current technologies. Hence, teacher training is crucial and these programmes must adequately prepare

teachers with skills necessary to teach and teach with ICT. Moreover, they must learn to work smarter and have a vision to implement ICT in their classes. Having vision requires strategic planning, risk-taking and decision making, imagination and commitment. In addition, teachers need to have a clear understanding of what to change as well as how to change (Fullan, 2007). Therefore, they need to become lifelong learners and develop their skills and abilities to overcome their fear of being the captain and focus on leading the ship. In other words the teachers must work to become transformational leaders.

2.4 Teacher's ICT Self-Efficacy and the Teaching of ICT

Research has been conducted on teacher's self-efficacy and reported to have greater effect on their adoption of ICT. Self-efficacy is defined as a belief in one's own abilities to perform an action or activity necessary to achieve a goal or task (Bandura, 1997). In real meaning, self-efficacy is the confidence that individual has in his/her ability to do the things that he/she strives to do (Buabeng-Andoh, 2012). Thus teachers' confidence refers both to the teachers' perceived likelihood of success on adopting ICT for educational purposes and on how far the teacher perceives success as being under his or her control (Peralta & Costa, 2007). Teachers' computer self-efficacy is described as a judgment of their capability to use a computer and other ICTs (Compeau & Higgins, 1995). According to Liaw, Huang and Chen (2007), teachers' computer self-efficacy influences their adoption of ICT in terms of teaching it as a course of study and using it as learning aid to support teaching and learning. Similarly, (Yuen & Ma, 2008) revealed that the Hong Kong teachers' implementation of ICT was depended on simplicity of computer use and perceived teacher self-efficacy.

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Christensen and Knezek (2006) described computer self-efficacy as computer confidence in competence. Knezek and Christensen revealed that teachers' competence with computer technology is a key factor of effective adoption of ICT in teaching. Peralta and Costa (2007) conducted a study on 20 teachers' competences and confidence regarding the use of ICT in classrooms. They revealed that in Italy, teachers' technical competence with technology is a factor of improving higher confidence in the use of ICT. In addition, teachers in Greece reported pedagogical and personal factors as those which mostly contribute to their confidence in ICT use.

Also, innovative teachers in Portugal linked the perception of confidence in adopting ICT with the loss of fear of damaging the computer and at the same possessing absolute control over the computer. This implies that fear on the part of some teachers decreases their confidence in terms of using ICT and subsequently teaching it or applying it in teaching.

However, they reported plenty of available time to work and practice ICT, support of experienced teachers and training as favourable conditions for gaining confidence in ICT usage. The conventional teachers also reported organizational factors as a facilitating condition towards gaining confidence and finally new teachers stated that their confidence level in using ICT depended on personal factors. According to Jones (2004), teachers feel reluctant to use computer if they lack confidence. "Fear of failure" and "lack of ICT knowledge" (Balanskat et al., 2007) have been cited as some of the reasons for teachers' lack of confidence for adopting and integrating ICT into their teaching. Similarly, in a survey conducted by (Jones, 2004), approximately 21% of the teachers who were surveyed, reported that lack of confidence influence their use of computers in their classrooms stated that "many teachers who do not consider themselves to be well skilled in using ICT feel anxious

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about using it in front of a class of children who perhaps know more than they do"

(Jones, 2004, p. 7).

CHAPTER THREE

METHODOLOGY

This chapter describes the processes and procedures by which data required for the study was collected and analysed. It specifically takes a critical look at the research design, population, sample and sampling procedure, research instrument, validity and reliability of research instrument, administration of the instrument and data analysis procedure.

3.1 Research Design

This study adopted the descriptive survey research design. Descriptive research design is used in cases where researchers expect to have target group explain or describe certain issues about important variables of the study. According to Amedahe (2000), in descriptive research, the events or conditions either already exists or have occurred and the researcher merely selects the relevant variables for an analysis of their relationships. Hence; the design is selected to satisfy this aspect of the study. It is an efficient way to obtain information needed to describe the attitudes, opinions and views of various stakeholders on the challenges teachers especially teachers face in teaching ICT in basic schools.
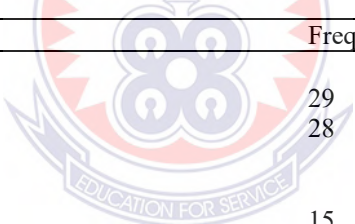
3.2 Population of the Study

The target population of this study was made up of teachers who teach ICT in all public basic schools in the in the Atwima Nwabiagya District of the Ashanti Region. In all 68 (comprising male and females) makes up the total population.

3.3 Sample and Sampling Procedure

The researcher employed purposive sampling technique in selecting the sample for the study. Purposive sampling is used in cases where the specialty of an authority can select a more representative sample that can bring more accurate results than by using other probability sampling techniques (Gay, 2002). The process involves nothing but purposely handpicking individuals from the population based on the authority's or the researcher's knowledge and judgment. The researcher on purpose decided to select all teachers of various basic schools within the Atwima Nwabiagya District of the Ashanti Region for the study. The researcher therefore arrived at a sample size of 57 teachers. Table 3.1 presents the demographic information on the participants.

Table 3.3: Demographic characteristics of respondents

Variable	Frequency	Percentage %
Gender		
Female	29	49.1
Male	28	50.9
Age groups		
21-30 years	15	26.3
31-40 years	29	50.9
41 and above	13	22.8
Education Qualification		
Post Graduate	16	28.1
Degree	38	66.7
HND	3	5.3
Number of years taught		
2 - 5 years	11	19.6
6 – 10 years	21	37.5
11 years and above	24	42.9

Source: Field Work, 2016

Table 4.1 shows the demographic representation of respondents. Out of a 57 respondents, 29 respondents representing 49.1% were female with the remaining 28 respondents representing 50.9% being male. This indicates that majority of the

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teacher population were female. Moreover, 38 respondents representing 66.7% had Bachelor's Degree, 16 respondents representing 28.1% possessed Post Graduate certificates with the remaining three (3) respondents representing 5.3% possessing HND. This indicates that a majority of the respondents had the minimum requirement for teaching at the second cycle level. On the other hand, 24 respondents representing 42.9% teaching experience of at least 11 years, 21 respondents representing 37.5% had 6-10 years of experience whilst the remaining 11 respondents representing 19.6% had 2-5 years teaching experience. This implies that respondents had the requisite experience to provide adequate data needed for generalization of results.

3.4 Instrumentation

The instrument that the researcher employed for data collection was a set of questionnaires. This is because, the use of questionnaires promises a wider coverage since researchers can approach respondents more easily than other methods (Amedahe, 2002). Questionnaires also provide a sense of uniformity since questionnaires are consistent without variation during data collection. The questionnaire was developed by the researcher based on the literature reviewed. The questionnaire administered was made up of introduction and four sections (A, B, C and D). The introduction section briefly informed the respondents about the purpose of the study and assurance of anonymity for any kind of information they would provide. Section "A" of the questionnaire sought to obtain demographic data of the respondents. It included four items covering gender, age, educational qualification and years of teaching experience. Section "B" had eight items regarding the importance of teaching ICT (e.g. teaching of ICT ensures high order thinking in students) Section "C" also had six items which dealt with the challenges that teachers

face when teaching ICT (e.g. inadequate supply of computers). Section "D" of the instrument had five items that assessed the support that ICT teachers receive from school administrators (e.g. school administrators offer effective monitoring system for teachers' ICT use and integration). All of the items on sections B, C and D were rated on a 5-point Likert scale from 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree (See Appendix A)

3.5 Validity and Reliability of the Instrument

The validity (trustworthiness) and reliability issues demonstrate integrity and legitimacy of research (Aroni, Goeman, Stewart, Sawyer, Abramson & Thein, 1999). For the purpose of this study, the instrument was given to three colleague MA students who made an input and thoroughly vetted the instrument before its approval by my supervisor and other experts in educational measurement and evaluation and the field of research to establish its validity. More concretely, the face validity of the instrument, the structure, layout, alignment and configuration of the questionnaire were examined.

Reliability is the degree to which an assessment tool produces stable and consistent results. After the approval was given to the research instrument and o ensure reliability of the questionnaire items used for the study, the research instrument was piloted on a group of teachers (n=10) drawn from five schools in Bosomtwi District, which was outside of the study area. From the pilot study conducted, no ambiguous items were found. The reliability of the instrument was determined using the Cronbach alpha index. The instrument yielded reliability coefficient of 0.673 indicating a high degree of reliability of the questionnaire items. Consequently, the

researcher accepted the instrument to be reliable and appropriate for the study and continued its administration to the 57 respondents

3.6 Data Collection Procedure

Before the research instrument was administered to the participants, the researcher visited the sampled schools with introductory letter which was obtained from the Head of Department of Educational Leadership, College of Technology Education, University of Education, Winneba introducing the researcher as MA degree candidate who is undertaking this research. Moreover, a personal letter seeking permission to involve the teachers in the study was sent to the District Director of Education in Nkawie. With this permission and consent, the questionnaire was personally administered by the researcher. The researcher explained the purpose of the study to the teachers. They were made to understand that all information being provided would be treated with confidentiality and used for the purpose of research only. It took the researcher two weeks to administer and collect the questionnaire, due to the geographical location of the area; after it was personally delivered to the respondents. The researcher personally introduce herself to the head of various schools ahead of the scheduled time and later arranged for teachers to be met. The adequate time spent with the respondents helped the respondents to respond to the items and also asked for clarifications. A total of 68copies of the questionnaire will be administered.

The content of the questionnaire items was validated by research experts to measure what is supposed to measure. The researcher will use Cronbach Alpha reliability test to test the reliability of the questionnaire items. I will also give the

questionnaire items to my supervisor, colleagues and experts in this area to test for the appropriateness of the questionnaire.

3.7 Data Analysis Procedure

In order for this study to address the stated research questions, the data that were obtained from the respondents were organised, analysed, interpreted and presented using descriptive statistics. The data were coded and inputted into the Statistical Product and Service Solutions (SPSS) 16.0 version, a computer programme for data analysis and interpretation. Descriptive statistics describe, summarise and make sense of a particular set of data. According to Cohen, Manion and Morrison (2000), descriptive statistics "do exactly what they say" (p.503). That is, they describe and present data in terms of summary frequencies. In this direction, they make no inferences or predictions but rather they only report what has been found on a variety of ways. In relation to the related research questions and the items displayed in the questionnaire, descriptive statistics was used to analyse the data collected from the respondents. The results were presented in the form of percentages, means and standard deviations. Tables with frequencies and percentages were used to ensure that the issues were made clear to give visual impression on values without necessarily reading long sentences and also to help in the discussion and interpretation of the data collected.

To address the three research questions formulated means and standard deviations were used. A theoretical mean of 3.0 (1 + 2 + 3 + 4 + 5 =15/5=3) and above indicate agreement with the item while a theoretical mean of below 3.0 indicates disagreement.

3.8 Privacy, Confidentiality and Anonymity

After ensuring that participants understand the purpose and procedures followed throughout this research study, the participants were assured that their identities would be protected. The protection of identities would be guaranteed through not linking their names to the research publication or using quotes that may compromise their identities. The principle of privacy was applied, therefore the confidentiality and anonymity of the participant was protected at all times.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

This chapter therefore presents data collected and the results presented in accordance with the sequence of the research questions. The purpose of the study was to find out the challenges teachers face in teaching ICT in basic schools in Atwima Nwabiagya District of Ashanti Region, Ghana. A self-completion questionnaire was employed to collect data from the participants. The participants were asked to rate their agreement or disagreement with the items measured on a 5-point Likert scale ranging from strongly disagree =1, disagree =2, neutral =3, agree =4 and strongly agree =5 Responses from the sample size of 57 basic school ICT teachers from public schools were used in the analyses. Data obtained from the participants were analysed using descriptive statistics. The mean rating for each item and grand means were computed. The computed means were then compared with the theoretical mean rating (assuming normal distribution of responses) of 3.0 to determine whether or not the respondents agree or disagree with the statements on the questionnaire.

4.2 Presentation of Results on Teachers' Perception of Importance of Teaching ICT

Research question one: How do teachers perceive the importance of teaching ICT in basic schools in Atwima Nwabiagya District of Ashanti Region?

This research question sought to explore how teachers perceive the importance of teaching ICT in basic schools. In answering this research question, eight items were used to examine the importance of ICT in teaching. The participants were asked to rate their agreement or disagreement with the items on a 5-point Likert scale ranging from 1 strongly disagree to 5 strongly agree. The results are reported in Table 4.1.

Table 4.1: ICT teachers' rating of the perceived importance for the teaching of ICT

S/N	items	Mean (X)	SD	Remarks
1.	ICT improves the practical abilities of students	4.98	1.637	Agree
2.	Teachers adoption of ICT make learning interesting	4.41	.795	Agree
3.	Computer aided-instruction ensures student-centred learning	4.19	.826	Agree
4.	ICT allows students to conduct further studies	4.18	1.071	Agree
5.	The teaching of ICT ensures high order thinking in students	4.17	.861	Agree
6.	Students become less depended on teachers when teaching with ICT	4.10	.810	Agree
7.	ICT is catalyst for teaching	3.91	.888	Agree
8.	Students become problem solvers in the community	3.72	1.114	Agree
	Grand mean	4.21	1.000	Agree

Source: Fieldwork, 2016

From Table 4.1, the mean ratings of the items ranged between 3.72 and 4.98 suggesting that, in general the participants consider all the items important in respect to teaching and learning. From the results, the items can be grouped into three main categories. The first group of the items received the highest rating were the items that related to the "improvement of ICT in the practical abilities of students" (X=4.98, SD=1.637) and "teachers' adoption of ICT to make learning interesting" (X=4.41, SD=.795). The next group of items that the teachers considered important included the "use of ICT that ensures that the teacher adopts student-centred teaching (X=4.19, SD=.826), "ICT providing the opportunity for students to consider further studies (X=4.18, SD=1.071) and the "use of ICT in improving higher order thinking abilities

of students (X=4.17, SD=.861). Three items were rated least important by the participants and they comprise the perception that by using ICT, "students become less depended" (X=4.10, SD=.810) "ICT providing impetus for teaching" (X=3.91, SD= .888) and the fact that "ICT enables students become problem solvers in their communities" (X=3.72, SD=1.114)

Based on the grand mean, it can be concluded that participants agreed to the importance of teaching ICT in the basic schools (X=4.21, SD=1.000) and Table 4.1 shows this.

4.3 Presentation of Results on Challenges Teachers' Face when Teaching ICT

Research question two: What challenges do teachers face when teaching ICT in basic schools in Atwima Nwabiagya District of Ashanti Region?

This research question sought to find out from the participants the barriers affecting the teaching of ICT in the basic schools. To understand some of the key factors affecting the teaching of ICT in basic schools, participants were asked to rate a total of six items on a 5-point Likert scale. The weighting of the scale were strongly disagree =1, disagree =2, neutral =3, agree =4 and strongly disagree. The mean rating for each item was computed and then compared with the theoretical mean rating of 3.0 to determine whether participants agreed or disagreed with the items. Table 4.2 shows the summary results of participants on the challenges that teachers face when teaching ICT.

Table 4.2: ICT teachers' rating of the challenges faced for the teaching of ICT

S/N	items	Mean (X)	SD	Remarks
1.	Inadequate power supply	4.31	.831	Agree
2.	Inadequate time allotted on the timetable for the teaching of ICT	4.09	1.030	Agree
3.	Lack of qualified computer technician	4.09	.908	Agree
4.	Inadequate supply of software for ICT lessons	4.02	1.112	Agree
5.	Inadequate number of computers	3.94	1.124	Agree
6.	Lack of reliable internet access	3.14	1.394	Agree
	Grand mean	3.93	1.066	Agree

Source: Fieldwork, 2016

From Table 4.2, among the six items dealing with the challenges of the teaching of ICT in basic schools, all of the items were rated above the theoretical mean of 3.0. The item that related to the schools not having adequate power supply had the highest mean rating (X=4.31, SD= .831). The next highest mean rating related to inadequate time allotted to the teaching of ICT (X=4.09, SD=1.030) and then followed by lack of qualified computer technicians (X=4.09, SD=.908). However, the least rated challenge was inadequate access to the internet (X= 3.14, SD= 1.394).

In summary, the participants agreed that they face challenges when teaching ICT in the basic schools (X=3.93, SD=1.066) and Table 4.2 highlights this.

4.4 Presentation of Results on the Support ICT Teachers' Receive from School Administrators when Teaching ICT

Research question three: How do school administrators support the teaching of ICT in basic schools in Atwima Nwabiagya District of Ashanti Region?

This research question sought to find out the school administrators role in supporting the teaching of ICT in basic schools. In answering the research question, the mean rating for each item was computed. The computed means were then

compared with the theoretical mean rating (assuming normal distribution of responses) of 3.0 to determine whether respondents agreement with the support or not. Table 4.3 highlights school administrators' support in the teaching of ICT.

Table 4.3: ICT teachers' rating of support received from school administrators

S/N	items	Mean (X)	SD	Remarks
1.	School administrators have made provisions for ICT facilities	4.17	1.232	Agree
2.	School administrators have made provisions for ICT related learning aids	3.69	.708	Agree
3.	School administrators provide in-service training to teachers teaching ICT	3.20	.988	Agree
4.	School administrators offer effective monitoring system for teachers' ICT use and integration	2.03	1.342	Disagree
5.	School administrators have strategic plan for the use of technology for teaching	1.21	.679	Disagree
	Grand mean	2.86	.990	Disagree

Source: Fieldwork, 2016

From Table 4.3, among the five items dealing with support the teachers receive from the school administrators in relation to the teaching of ICT, three of the items were rated above the theoretical mean of 3.0. The participants indicated that school administrators have made provisions for ICT facilities (X=4.17, SD=1.232), then followed by provisions made by school administrators with respect to ICT related learning aids (X=3.69, SD=.708) and in-service training provided by school administrators for teachers who teach ICT (X=3.20, SD=.988). These results show that teachers agreed to the fact that school administrators do provide provisions for ICT facilities and ICT related learning aids as well as offering in-service training. On the other hand, two of the items "school administrators offering effective monitoring system for teachers ICT use and integration" (X=2.03, SD= 1.342) and "school administrators providing strategic plan for the use of ICT for teaching" (X=1.21, SD=.679) were rated below the theoretical mean of 3.0. This indicates that

participants disagreed that school administrators offer effective monitoring system for teachers' ICT use and also provide strategic plan for the use of ICT for teaching.

In total, the result revealed that the participants disagreed to the fact that teachers teaching ICT receive support from school administrators (X=2.86, SD=.990).

Summary of Findings

The current study was conducted to examine the perception of basic school teachers about the teaching of ICT in Atwima Nwabiagya District of Ashanti Region, Ghana. The study revealed the following findings.

1. Participants agreed to the importance of teaching ICT to the students of basic schools.

2. Participants also agreed that they face challenges (e.g. inadequate power supply, lack of qualified computer technicians, inadequate number of computers etc) when teaching ICT in the basic schools.

3. Participants of the study indicated that they do not receive support from school administrators when teaching ICT in basic schools.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

The study examined teachers' perception about the teaching of ICT in basic schools in Atwima Nwabiagya District of Ashanti Region, Ghana. Specifically, the following research questions were stated to guide the study. A self-completion questionnaire developed by the researcher was used to collect data from the participants.

Firstly, the study revealed that teachers' agreed to the importance of teaching ICT in the basic schools. This implies that teachers' perceive ICT to improve the practical abilities of students and also ensures high order thinking in students. This present finding is consistent with previous empirical study findings of Kozma (2005), Grimus (2000) and Papert (1993). For instance, Grimus reported that by teaching ICT skills in primary schools, the pupils are more prepared to face future developments based on proper understanding. Similarly, Papert in a study indicated that the teaching of ICT allow for the construction of higher order thinking thereby allowing the students to assume greater responsibility for their own learning. Moreover, Kozma found that ICT can be used to improve the delivery of instruction and access to education. Perhaps, the teachers' agreement to the importance of teaching ICT in basic schools is due to the fact that we are in 21st century whereby the government of Ghana have created much awareness and importance of ICT in education among its citizenry. As Yelland (2001) puts it, the teaching of ICT in schools is essential for providing opportunities for students to learn how to operate technological tools such as computers in this information age. Therefore, the teaching of ICT is important for students to acquire 21st century skills so as to function effectively in the society.

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Secondly, the study was conducted to find out whether or not teachers face challenges when teaching ICT in basic schools. The study indicated that teachers face challenges when teaching ICT in schools. This means that teachers' teaching ICT in basic schools face these challenges such as inadequate number of computers in the schools, inadequate power supply, lack of qualified computer technicians, lack of internet access and inadequate time allotted on the timetable for the teaching of ICT. This present finding is line with previous studies of Acquah (2012); Afful-Dadzie (2010); Hew and Brush (2007); Jones (2004); Madzima et al. (2010); Obiri-Yeboah et al. (2013); Odera (2011) and Sicilia (2005); William (2000). For example, Afful-Dadzie (2010) conducted a study in Sekondi-Takoradi metropolis that reported that most of the schools surveyed lacked internet accessibility. It also supports Madzima et al. (2010) who found that problem of internet access was one of the challenges affecting the ICT education in Swaziland. In connection with this finding, William asserted that the use of internet technologies for education in particular requires explicit tariff structures and long term infrastructure investment commitments that are not forthcoming in most countries. On this conception, Murphy, Coover and Owen (2002) recommended that the issue of most schools not having access to the internet services could be resolved through government regulations requiring internet service providers, public or private to subsidise cost or reduce tariffs for educational institutions.

Furthermore, on the issue of inadequate number of computers in the schools, it affirms findings of Acquah (2012) and Obiri-Yeboah et al. (2013) who in their respective studies found inadequate supply of computers affect the effective teaching of ICT. In supporting this finding, Hew and Brush (2007) argued that "without adequate computer hardware and software, there is little opportunity for teachers to

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integrate ICT into curriculum, even in cases where technology is abundant; there is no guarantee that teachers have easy access to those resources" (p.226). Similarly, Al-hardi (2012) also reported that lack of high quality computer hardware and suitable educational software were considered by the majority of teachers to be significant barrier to effective teaching of ICT. However, this finding contradicts with Kim and Khine (2006) assertion that once computers are in lace, the teaching of ICT will automatically follow.

Moreover, the respondents reported that time allotted on the timetable for the teaching of ICT is inadequate. This confirms the previous finding of Madzima et al. (2010) who found that lack of time scheduled on the timetable to teach ICT with students is a factor mentioned by teachers as a barrier to teaching ICT. Similarly, Sicilia (2005) in a study conducted reported that the most common challenge indicated by all the teachers was the lack of time they had to plan ICT lessons, explore the different internet sites or look at various aspects of software. The implication is that teachers when given time to practice with computers learn, share and collaborate with peer; it is likely that they will integrate the ICT into their teaching. In supporting this view, Gomes (2005) observed that one of the main resources that teachers do not use ICT in the classroom is lack of time necessary to accomplish plans. Jones (2004) explained that teachers need time to locate internet services, prepare lessons, explore and using the technology, deal with technical problems and receive adequate training. Cuban and Kirkpatrick (2002) concluded that providing ICT equipment to schools or teachers and also developing ICT curriculum will not necessarily make a difference in teaching and learning but what will make the difference is the way in which these ICT equipment and other resources are used. As the saying goes "practice makes man perfect", if these pupils and teachers are not

given enough time to practice with the computers and giving them enough to use them, there will not be any important impact of ICT curriculum on them.

Again, the study revealed that lack of qualified technicians affect the effective teaching of ICT in basic schools. This current finding agrees with Madzima et al. (2010). They found that 68% of the teachers' surveyed indicated that lack of technical assistance regarding ways of using ICT in class hindered the teaching of ICT in the basic schools. The study also reported that teachers in schools with no technical coordinator were likely to cite lack of technical support as a barrier to effective teaching of ICT than teachers in schools with a technical coordinator. Jones (2004) corroborated this current finding when he pointed out that "if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly resulting in a higher risk of technical breakdowns" (p.12). From this finding, it appears that technical faults might discourage teachers from using ICT in their teaching because of the fear of computer breaking down during lessons. It is therefore along this line that Tong and Trinidad (2005) reported that lack of technical assistance and support are very stressful for the teachers which may affect the teachers' willingness in the implementation and adoption of ICT curriculum. Perhaps a reason for this lack of technical support inhibiting the smooth implementation of ICT curriculum in basic schools in Atwima Nwabiagya District can be found in Veen (1996) observation that teachers count on the support of the technicians for tasks such as installation and use of software and in collaborative work during the instructional periods in the classroom and laboratory. In the opinion of Carol (1997), the support provided by technical assistants is very valuable to teachers. Hence, the availability of technical support would be an ideal help for the teaching of

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ICT in basic schools since most of teachers lack skills and confidence in using computers in front of their students.

To respond to the third research question, the results of the study revealed that teachers do not receive adequate support from the school administrators. . The present finding goes to affirm Schiller (2002) assertion that school leadership plays an increasingly important role in leading curriculum change, providing vision and objectives, as well as professional development initiatives in teaching ICT in schools to bring about pedagogical changes. One could argue that the failure by educational institutions to teach ICT in education and imprint it on the minds of teachers can be attributed to lack of leadership capacity in schools. It can be also inferred from this finding that effective and supportive school leaders and heads are most likely to both increase and deepen ICT implementation in schools. More concretely, the study also revealed that school administrators do not organise in-service training to the ICT teachers. This result is in congruent with the assertion of Odera (2011) that due to lack of adequate training for teachers, the implementation of ICT curriculum is carelessly handled. It appears that this result may be a reflection of the current situation where the motives and objectives behind the ICT curriculum are not even clear to most teachers and students alike. In advocating for the reason why in-service training is important especially for ICT curriculum, Levin and Wadmany (2008) indicated that in-service training for teachers equip them with educational practices and strategies to address beliefs, skills and knowledge to improve teachers' awareness and insights in the process of implementing curriculum innovation like ICT in classroom. Mose et al. (2012) corroborated with Levin and Wadmany assertion pointed out that teachers who are committed to in-service training programmes gain knowledge of ICT integration and classroom technology organisation. It is therefore along this line that can be

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inferred that the successful implementation of ICT curriculum in basic schools depends strongly on how teachers have been prepared to implement the ICT curriculum since the teachers are bedrock in any curriculum innovation. Hence, they must be properly trained in the teaching of ICT.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the research process and its key findings. It also draws conclusions from the findings and makes recommendations for improving the teaching of ICT in basic schools and suggestions for further research as well.

5.1 Summary of Research process

The aim of the study was to find out perception of teachers on the teaching of ICT in basic schools in Atwima Nwabiagya District of Ashanti Region. Specifically, it was designed to elicit respondents' view on the importance of teaching ICT. It also sought to determine the challenges that affect the effective teaching of ICT. More so, the study sought to examine the support the teachers receive from school administrators with respect to the teaching of ICT. A self-completion questionnaire which was in the form of a rating scale was the main research instrument used for the data collection. The instrument was divided into four main sections (A, B, C and D. Section A contained four items on demographic data of the participants which included their gender, age, educational qualification and years of teaching experience. Section B had eight items regarding the importance of teaching ICT (e.g.   Section C had six items which dealt with the challenges that teachers face when teaching ICT. Section D of the instrument also had five items assessed the support that ICT teachers receive from school administrators (e.g. All of the items on the sections B, C and D were rated on a 5-point Likert scale from 1 =strongly disagree, 2 =disagree, 3=

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neutral, 4 =agree and 5= strongly agree. The weight for each item was computed with the theoretical mean of 3.0 to determine whether the respondents agreed or disagreed with the items. A total of 57 respondents were randomly selected and descriptive statistics in the form of frequencies, percentages, means and standard deviations were employed to analyse the data collected.

Summary of Key Findings

The study reported the following key findings.

1. Participants agreed to the importance of teaching ICT to the students of basic schools.

2. Participants also agreed that they face challenges (e.g. inadequate power supply, lack of qualified computer technicians, inadequate number of computers etc) when teaching ICT in the basic schools.

3. Participants of the study indicated that they do not receive support from school administrators when teaching ICT in basic schools.

5.2 Conclusion

The following conclusions are drawn from the findings.

The fact that participants agreed to the importance of teaching ICT in the basic schools indicates that they are more willing to teach ICT in spite of limited resources in the schools.

Of the factors identified as challenges affecting the teaching of ICT in the basic schools are to be addressed, it will facilitate the effective implementation of ICT curriculum in the basic schools in the Atwima Nwabiagya District of Ashanti Region. The fact that participants reported that do not receive support from the school administrators suggests that the teaching of ICT in the basic schools will impede the effective implementation of ICT curriculum in the schools.

5.3 Recommendations

Based on the findings from the study and conclusions drawn, the following recommendations are made:

1. Government should expedite action on its promise to provide basic schools with laptops and also ensure that certain basic resources such as computer laboratories, computer software and other curriculum materials should be provided to the schools. Better still, Ghana Education Service should adopt the strategy of providing well resourced ICT laboratories that could serve a cluster of schools to augment the other facilities available in the individual schools.

2. Ghana Education Service should as matter of urgency consult mobile telecommunication companies such as MTN, Vodafone Ghana, Tigo, Glo and Airtel to provide schools with internet access.

3. Regular in-service training programmes should be organised by school administrators for ICT teachers to equip them with the requisite knowledge and expertise to teach with technologies.

4. Schools administrators should put in place appropriate monitoring systems to monitor the progress of the ICT programmes that run in schools.

5.4 Suggestions for Further Studies

In the course of this study, certain areas were identified that related to this study for which further research could be conducted. These are:

1. This study employed cross-sectional descriptive survey design which examined the teachers' perception at a given time. Since teaching of ICT is a process and teachers' perceptions change over time, it is suggested that longitudinal studies should be conducted to enable researchers, school administrators and curriculum developers to track, monitor and address the challenges that teachers are facing over a longer implementation period.

2. Further studies on the same study area may be conducted by extending to cover more schools in the District or other parts of Ashanti Region to explore the basic school ICT teachers' perception about the teaching of ICT.

3. Future studies should increase the sample size and address the relationships between teachers' perception on the teaching of ICT and other variables such as teachers' age, gender, education qualification and years in teaching ICT.

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APPENDIX A

Questionnaire

Dear teacher, this survey is part of a study designed to find out the concerns that teachers have with regard to the implementation of ICT curriculum at the basic school level and I would be grateful to have you participate in the study. The study is meant basically for academic purpose. Therefore, every information you give will be treated with absolute confidentiality and anonymity. It is important to note that your participation is voluntary.

I would be very grateful if you could respond to the statements on the questionnaire as honestly and objectively as possible.

Thank you very much in anticipation of your co-operation

SECTION A

DEMOGRAPHIC INFORMATION

(Please tick√ the right option or write out your answer as applicable)

1. What is your gender?

   Male [　] 　　Female [　]

2. What is your age group?

   20 – 25 [　]　26 – 30 [　]　31 – 35 [　]　36 – 40 [　]　41 – 45 [　]　46 and above [　]

3. What is your highest educational qualification?

   SSSCE/WASSCE [　]　Teacher's Cert A [　]　Diploma [　]　HND [　]

   Bachelor's [　]　Master's [　] Other (Please specify)

   ………………………………..

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4. Are you a professionally trained ICT teacher?

Yes [   ]   No [   ]

5. Which level of basic school do you teach?
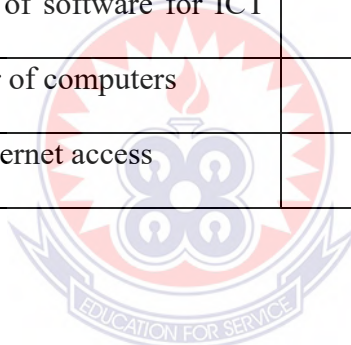
Primary [   ]   JHS [   ]

SECTION B

The following items relate to the importance of teaching ICT in basic schools. Please indicate the extent to which you agree or disagree with the items. Please tick (√) the most appropriate response against the items when responding them. The scale notation is: **1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=Strongly Agree (SA)**

S/N	Item	SD (1)	D (2)	N(3)	A(4)	SA(5)
1	ICT improves the practical abilities of students					
2	Teachers adoption of ICT make learning interesting					
3	Computer aided-instruction ensures student-centred learning					
4	ICT allows students to conduct further studies					
5	The teaching of ICT ensures high order thinking in students					
6	Students become less depended on teachers when teaching with ICT					
7	ICT is catalyst for teaching					
8	Students become problem solvers in the community					

SECTION C

The following items relate to the challenges that teachers face when teaching ICT in basic schools. Please indicate the extent to which you agree or disagree with the items. Please tick (√) the most appropriate response against the items when responding them. The scale notation is: **1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=Strongly Agree (SA)**

S/N	Item	SD (1)	D (2)	N(3)	A(4)	SA(5)
1	Inadequate power supply					
2	Inadequate time allotted on the timetable for the teaching of ICT					
3	Lack of qualified computer technician					
4	Inadequate supply of software for ICT lessons					
5	Inadequate number of computers					
6	Lack of reliable internet access					

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SECTION D

The following items relate to the support that teachers receive from school administrators when teaching ICT in basic schools. Please indicate the extent to which you agree or disagree with the items. Please tick (√) the most appropriate response against the items when responding them. The scale notation is: **1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A) and 5=Strongly Agree (SA)**

S/N	Item	SD (1)	D (2)	N(3)	A(4)	SA(5)
1	School administrators have made provisions for ICT facilities					
2	School administrators have made provisions for ICT related learning aids					
3	School administrators provide in-service training to teachers teaching ICT					
4	School administrators offer effective monitoring system for teachers' ICT use and integration					
5	School administrators have strategic plan for the use of technology for teaching					